DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2020–0058; FF09E21000 FXES11110900000 212]

RIN 1018–BE87

Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for the Upper Coosa River Distinct Population Segment of Frecklebelly Madtom and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the frecklebelly madtom (*Noturus munitus*), a fish species from Louisiana, Mississippi, Alabama, Georgia, and Tennessee, as an endangered or threatened species and designate critical habitat under the Endangered Species Act of 1973, as amended (Act). After a review of the best available scientific and commercial information, we find that listing the frecklebelly madtom as an endangered or a threatened species throughout all of its range is not warranted. However, we determined that listing is warranted for a distinct population segment (DPS) of the frecklebelly madtom in the Upper Coosa River in Georgia and Tennessee. Accordingly, we propose to list the Upper Coosa River DPS of the frecklebelly madtom as a threatened species with a rule issued under section 4(d) of the Act (''4(d) rule''). If we finalize this rule as proposed, it would add this DPS to the List of Endangered and Threatened Wildlife and extend the Act's protections to the DPS. We also propose to designate critical habitat for the Upper Coosa River DPS under the Act. In total, approximately 134 river miles (216 kilometers) in Georgia and Tennessee fall within the boundaries of the proposed critical habitat designation. We also announce the availability of a draft economic analysis (DEA) of the proposed designation of critical habitat for the Upper Coosa River DPS.

DATES: We will accept comments received or postmarked on or before January 19, 2021. 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 January 4, 2021.

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

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search box, enter FWS–R4–ES–2020–0058, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search 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 Now!''

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS–R4–ES–2020–0058, U.S. Fish and Wildlife Service, MS: JAO/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 *http://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: The species status assessment (SSA) report and other materials relating to this proposal can be found on the Southeast Region website at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058.

For the critical habitat designation, the coordinates or plot points or both from which the maps are generated are included in the administrative record and are available at *https://www.fws.gov/southeast/,* at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058, and at the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we may develop for the critical habitat designation will also be available at the Service website and field office set out above and may also be included in the preamble and/or at *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: William Pearson, Field Supervisor, U.S. Fish and Wildlife Service, Alabama Ecological Services Field Office, 1208–B Main Street, Daphne, AL 36526; telephone 251–441–5870. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, if we determine that a species may be an endangered or threatened species throughout all or a significant portion of its range, we are required to promptly publish a proposal in the **Federal Register** and make a determination on our proposal within 1 year. To the maximum extent prudent and determinable, we must designate critical habitat for any species that we determine to be an endangered or threatened species under the Act. Listing a species as an endangered or threatened species and designation of critical habitat can only be completed by issuing a rule.

What this document does. This rule proposes the listing of the Upper Coosa River distinct population segment (DPS) of frecklebelly madtom as a threatened species with a rule under section 4(d) of the Act and proposes the designation of critical habitat for the DPS.

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 factors driving the status of the Upper Coosa River DPS are habitat destruction and degradation caused by agriculture and developed land uses resulting in poor water quality (Factor A).

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary) to designate critical habitat concurrent with listing to the maximum extent prudent and determinable. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data available and after taking into consideration the economic impact, the

impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Peer review. 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 of listing actions under the Act, we sought the expert opinions of 10 appropriate specialists regarding the SSA report. We received responses from two specialists, and their input informed this proposed rule. The purpose of peer review is to ensure that our listing determinations, critical habitat designations, and 4(d) rules are based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in the biology, habitat, and threats to the species.

Because we will consider all comments and information we receive during the comment period, our final determinations may differ from this proposal. Based on the new information we receive (and any comments on that new information), we may conclude that the Upper Coosa River DPS is endangered instead of threatened, or we may conclude that the DPS does not warrant listing. Such final decisions would be a logical outgrowth of this proposal, as long as we: (1) Base the decisions on the best scientific and commercial data available after considering all of the relevant factors; (2) do not rely on factors Congress has not intended us to consider; and (3) articulate a rational connection between the facts found and the conclusions made, including why we changed our conclusion.

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 concerned 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 frecklebelly madtom's biology, range, distribution, and population trends, particularly in the upper Coosa River watershed in Georgia and Tennessee, including:

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

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns;

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

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

(2) Factors that may affect the continued existence of the frecklebelly madtom, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.

(3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to the frecklebelly madtom and existing regulations that may be addressing those threats.

(4) Additional information concerning the historical and current status, range, distribution, and population size of the frecklebelly madtom, and specifically the Upper Coosa River DPS, including the locations of any additional populations of the frecklebelly madtom.

(5) Information on regulations that are necessary and advisable to provide for the conservation of the Upper Coosa River DPS of frecklebelly madtom and that the Service can consider in developing a 4(d) rule for the DPS, including information concerning the extent to which we should include any of the section 9 prohibitions in the 4(d) rule or whether any other forms of take should be excepted from the prohibitions in the 4(d) rule. We particularly seek comments concerning:

(a) Whether we should add a provision to except incidental take resulting from silvicultural practices and forest management activities that implement State-approved best management practices and comply with forest practice guidelines related to water quality standards.

(b) Whether there are additional provisions the Service may wish to consider for the section 4(d) rule in order to conserve, recover, and manage the Upper Coosa River DPS.

(6) The reasons why we should or should not designate habitat as ''critical habitat'' under section 4 of the Act (16 U.S.C. 1531 *et seq.*), including information to inform the following factors that the regulations identify as reasons why designation of critical habitat may be not prudent:

(a) The species is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat to the species;

(b) The present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or threats to the species' habitat stem solely from causes that cannot be addressed through management actions resulting from consultations under section 7(a)(2) of the Act; or

(c) No areas meet the definition of critical habitat.

(7) Specific information on:

(a) The amount and distribution of Upper Coosa River DPS habitat;

(b) Information on the physical or biological features essential to the conservation of the DPS;

(c) What areas, that were occupied at the time of listing and that contain the physical or biological features essential to the conservation of the DPS, such as the Coosawattee River in Georgia, should be included in the critical habitat designation and why;

(d) The methods we used, particularly the use of environmental DNA, to identify occupied critical habitat for each of the units;

(e) Special management considerations or protection that may be needed in critical habitat areas we are proposing, including managing for the potential effects of climate change; and

(f) What areas not occupied at the time of listing are essential for the conservation of the DPS and should be included as critical habitat and why. We particularly seek comments:

(i) Regarding whether occupied areas are adequate for the conservation of the DPS; and

(ii) Providing specific information regarding whether or not unoccupied areas would, with reasonable certainty, contribute to the conservation of the DPS and contain at least one physical or biological feature essential to the conservation of the DPS.

(8) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(9) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation, and the related benefits of including or excluding specific areas.

(10) Information on the extent to which the description of probable economic impacts in the draft economic analysis is a reasonable estimate of the likely economic impacts.

(11) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area

outweigh the benefits of including that area under section 4(b)(2) of the Act.

(12) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

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, will not be considered in making 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.''

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 *http://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 *http://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 *http://www.regulations.gov.*

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. For the immediate future, we will provide these public hearings using webinars that will be announced on the Service's website, in addition to the **Federal Register**. The use of these virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

On April 20, 2010, we were petitioned by the Center for Biological Diversity and others to list 404 aquatic species in the southeastern United States, including the frecklebelly madtom, under the Act. In response to the petition, we completed 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 frecklebelly madtom. On April 15, 2015, the Center for Biological Diversity amended a complaint against the Service for failure to complete a 12-month finding for the frecklebelly madtom in accordance with statutory deadlines. On September 9, 2015, the Service and the Center for Biological Diversity filed stipulated settlements in the District of Columbia, agreeing that the Service would submit to the **Federal Register** a 12-month finding for the frecklebelly madtom no later than September 30, 2020 (*Center for Biological Diversity* v. *Jewell,* case 1:15–CV–00229–EGS). This document constitutes our concurrent 12-month warranted petition finding, proposed listing rule, and proposed critical habitat rule.

Supporting Documents

An SSA team prepared an SSA report for the frecklebelly madtom. 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. The Service sent the SSA report to 10 independent peer reviewers and received 2 responses. The Service also sent the SSA report for review to 13 partners, including scientists with expertise in fish biology, stream and riverine ecology, and factors negatively and positively affecting the species. We received review from two partners, Mississippi Museum of Natural Science and Georgia Department of Natural Resources.

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the frecklebelly madtom (*Noturus munitus*) is presented in the SSA report (version 1.2; Service 2020, pp. 5–15; available at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058).

The frecklebelly madtom is a catfish species that inhabits the main channels and larger tributaries of large river systems in Louisiana, Mississippi, Alabama, Georgia, and Tennessee. The species has a broad but disjunct distribution across the Pearl River watershed and Mobile River Basin, with populations in the Pearl River and Bogue Chitto River in the Pearl River watershed and the Upper Tombigbee, Alabama, Cahaba, Etowah, and Conasauga river systems in the Mobile River Basin (Piller *et al.* 2004, p. 1004; Bennett *et al.* 2010, pp. 507–508). Throughout its range, the frecklebelly madtom primarily occupies streams and rivers within the Gulf Coastal Plain physiographic province; however, it also occurs in the Ridge and Valley physiographic province in the Conasauga River and Piedmont Upland physiographic province in the Etowah River (Mettee *et al.* 1996, pp. 408–409).

The frecklebelly madtom is a small, stout catfish reaching 99 millimeters (mm) (3.9 inches (in)) in length (Etnier and Starnes 1993, p. 324) and distinctively marked with dark saddles (Suttkus and Taylor 1965, p. 171). The color of the frecklebelly madtom is a mixture of light yellows with brownish patches and a combination of many scattered specks or freckles on the underside, which provides camouflage in its preferred habitats and inspired its common name (Suttkus and Taylor 1965, p. 176; Vincent 2019, unpaginated). The fins' colors are typically mottled or blotched (Etnier and Starnes 1993, p. 324). The frecklebelly madtom is armed with venomous pectoral and dorsal spines used to defend against predation and has barbels around the mouth that act as sensory organs.

The species belongs in the family Ictaluridae, and all species in the genus *Noturus,* referred to as madtoms, are diminutive and possess long and low adipose fins (*i.e.,* found on the back behind the dorsal fin) (Page and Burr 2011, p. 207). The currently recognized taxon is *Noturus munitus* (Suttkus and Taylor 1965, entire; Rhode 1978, p. 465). Since the time of description, uncertainty regarding the taxonomic status of some populations of frecklebelly madtom has arisen. In 1998, the name ''Coosa madtom'' (*Noturus sp. cf. N. munitus*) was coined to describe the madtoms, previously identified as frecklebelly madtom, in the Conasauga and Etowah Rivers that were morphologically distinct from the

frecklebelly madtom found elsewhere (Boschung and Mayden 2004, p. 347; Neely 2018, p. 1). However, a recent analysis of the existing morphological and genetic datasets documented substantial genetic divergence between all populations from distinct watersheds. The Pearl and Mobile basin populations exhibited the strongest genetic divergence, followed by Tombigbee and Alabama River (Cahaba and Coosa) populations (Neely 2018, entire). The Cahaba and Coosa populations exhibited the lowest genetic differentiation and could not be reliably diagnosed based on morphology. Therefore, because the data indicate divergence between populations but do not support the description of distinct subspecies or species, we consider each population of frecklebelly madtom to be a separate evolutionary significant unit (ESU) (Neely 2018, p. 10) for purposes of this determination. ESUs are partially defined as a population that ''represents an important component in the evolutionary legacy of a species'' (Waples 1991, p. 12). Because evolution is a continual process, elements that represent a species' evolutionary legacy are also important elements of a species' adaptive capacity. Therefore, the ESUs recommended by Neely (2018, entire) were used to inform our analysis on the frecklebelly madtom's representation, an attribute of the species' viability (Service 2020, pp. 3, 35–37).

For the frecklebelly madtom to survive and reproduce, individuals need suitable habitat that supports essential life functions at all life stages. Three elements appear to be essential to the survival and reproduction of individuals: Flowing water, stable substrate, and aquatic vegetation. The frecklebelly madtom typically occurs over firm gravel substrates, such as shoals and riffles, in small to large swift-flowing streams often associated with large rivers and their tributaries (Suttkus and Taylor 1965, pp. 177–178; Mettee *et al.* 1996, p. 409; Vincent 2019, unpaginated). However, the species will use streams dominated with sand substrates if suitable cover such as large woody debris is present (Wagner 2019, pers. comm.). Cover is an important habitat factor for the species, as it provides for concealment against predators (Vincent 2019, unpaginated), foraging habitat, and nesting habitat. In some rivers where the species is found, the frecklebelly madtom is often associated with aquatic vegetation, such as river weed (*Podostemum*), and under large, flat rocks (Mettee *et al.* 1996, p. 409, Freeman *et al.* 2003, p. iii). In the upper Etowah and Conasauga Rivers, the frecklebelly madtom has been collected in moderate to swift currents over boulders, rubble, cobble, and coarse gravel and around concentrations of river weed.

The frecklebelly madtom is likely nocturnal and most active at night. The species has a lifespan of approximately 5 years (Mettee *et al.* 1996, pp. 408–409) and is reproductively mature in the second summer after birth, similar to other madtom species (Burr and Stoeckel 1999, p. 65). In the wild, reproduction is thought to occur between June and July (Trauth *et al.* 1981, p. 66). At the Private John Allen National Fish Hatchery in Tupelo, MS, frecklebelly madtoms have been observed spawning between the end of May to mid-August (Schwarz 2020, unpublished report). The female produces 50 to 70 eggs, which are released all at one time (Trauth *et al.* 1981, p. 66). Fecundity in madtoms is among the lowest for North American freshwater fishes due to their small size, relatively large egg size, and high level of parental care given to the fertilized eggs (embryos) and larvae (Dinkins and Shute 1996, pp. 58–60; Burr and Stoeckel 1999, pp. 66–67). However, the frecklebelly madtom is considered highly fecund for a madtom and among the highest fecundity known for its subgenus, *Rabida* (Bennett *et al.* 2010, p. 507).

Nesting sites for madtoms are typically cavities under natural material (rocks, logs, empty mussel shells) or human litter (inside cans or bottles, under boards). Madtoms construct cavities on the bottoms of streams by moving substrate using their heads to push gravel or their mouths to carry and transport gravel and pebbles (Vincent 2019, unpaginated). Both males and females may construct nesting cavities (Burr and Stoeckel 1999, p. 69).

The species is an opportunistic insectivore feeding on a variety of aquatic insects and larvae, including caddisflies, mayflies, blackflies, and midges (Miller 1984, p. 9). There appear to be seasonal shifts in food preference between the sexes, with males typically preferring caddisflies in the fall months, and the females preferring midges during the same time (Miller 1984, p. 10).

Regulatory and Analytical Framework

Regulatory Framework

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 is an ''endangered species'' or a ''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 expected response by the species, 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 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 the Service 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 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 a decision by the Service on whether the species should be proposed for listing as an endangered or threatened species under the Act. It does, however, 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. The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058.

To assess frecklebelly madtom viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. 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.

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. For frecklebelly madtom populations to be resilient, the needs of individuals (flowing water, substrate, and aquatic vegetation) must be met at a large scale. Stream reaches with suitable habitat must be large enough to support an appropriate number of individuals to avoid issues associated with small population sizes, such as inbreeding depression. At the species level, the frecklebelly madtom 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). To evaluate the current and future viability of the frecklebelly madtom, we assessed a range of conditions to allow us to consider the current and future effects on resiliency, representation, and redundancy.

Delineating Representation and Resilience Units

We delineated representation and resilience units for the frecklebelly madtom. Representation units were delineated to describe the breadth of known genetic, phenotypic, and ecological diversity within the species. There is evidence of differentiation in habitat use, morphology, and genetics for areas that the frecklebelly madtom occupies, which are disconnected spatially across the landscape. Resilience units were delineated to describe at a local scale how the species withstands stochastic events. These resilience units are not meant to represent individual populations as they may represent multiple or portions of groups of demographically linked interbreeding individuals.

In total, we identified six representation units for the frecklebelly madtom: Pearl River (A), upper Tombigbee River (B), lower Tombigbee/Alabama Rivers (C), Alabama River (D), Cahaba River (E), and upper Coosa River (F) (see table 1, below). Four representation units (Pearl River (A), upper Tombigbee River (B), Cahaba River (E), and upper Coosa River (F)) are the ESUs based on the evaluation of morphometric and genetic datasets (Neely 2018, entire). Morphometric and genetic data from the remaining two representation units (lower Tombigbee/Alabama Rivers (C) and Alabama River (D)) were not available to be analyzed in the 2018 study (Neely 2018, entire) and, therefore, were not identified as ESUs in that study.

The lower Tombigbee/Alabama Rivers (C) and Alabama River (D) representation units reflect occurrences of the species in the Mobile River Basin that are the farthest downstream and within a large river habitat type that is distinct from the remainder of the units in the Mobile River Basin. Furthermore, these reaches are disconnected from the nearest adjacent representation units by dams that act as dispersal barriers for the species. Therefore, these reaches are assessed as two individual representation units. The Alabama River (D) representation unit consists of a single HUC 10 watershed that is isolated

from other representation units by dams. The remaining unit, lower Tombigbee/Alabama Rivers (C), is disconnected from the upper Tombigbee River and Alabama River units by dams.

Resilience units were delineated as aggregations of adjacent U.S. Geological Survey Hydrological Unit Code (HUC) 10 watershed boundaries that contain a frecklebelly madtom observation and are not disconnected by dams or other major habitat alterations that may present a barrier to movement. While resiliency is typically assessed at the scale of a population, there was little information to delineate populations of the frecklebelly madtom. By using HUC 10 watersheds, we are able to delineate resilience units that can be measured and evaluated at a local scale similar to that we would expect for a population. We determined this to be the most appropriate scale for measuring resiliency. We identified 16 resilience units consisting of 66 HUC10 watersheds across the range of the frecklebelly madtom (see table 1, below).

TABLE 1—REPRESENTATION UNITS AND RESILIENCE UNITS USED TO ASSESS VIABILITY OF THE FRECKLEBELLY MADTOM

Representation units	Resilience units
Pearl River (A)	Bogue Chitto River (A1).
	Pearl River (A2).
Upper Tombigbee River (B)	East Fork Tombigbee (B1).
	Sipsey River (B2).
	Luxapallila Creek (B3).
	Buttahatchee River (B4).
	Bull Mountain Creek (B5).
	Upper Tombigbee River (mainstem) (B6).
Lower Tombigbee/Alabama Rivers (C)	Lower Tombigbee River (C1).
	Lower Alabama River (C2).
Alabama River (D)	Alabama River (D1).
Cahaba River (E)	Cahaba River (E1).
	Alabama River/Big Swamp (E2).
Upper Coosa River (F)	Conasauga River (F1).
	Coosawattee River (F2).
	Etowah River (F3).

Methods To Assess Current Condition

We assessed the current resiliency (ability of populations to withstand stochastic events) of frecklebelly madtom resilience units by considering occurrence data throughout the species' range. We used occurrence data to estimate range extent and range geometry (*i.e.,* number of named streams with occurrences). These metrics can be useful for evaluating resiliency, as larger areas of occupied habitat and multiple occupied streams (more complex ranges) are more robust to stochastic events (*i.e.,* a single more localized event would be unlikely to negatively affect the entire population or unit if many and larger reaches of streams were occupied). Occurrence data for the frecklebelly madtom are only available for five of the six representation units: The Pearl River (A), upper Tombigbee River (B), Alabama River (D), Cahaba River (E), and upper Coosa River (F). Therefore, we conducted our assessment of occurrences only on resilience units within those representation units, and we categorized current resiliency into high, moderate, low, or likely extirpated conditions, based on our evaluation of total number of occurrences, the number of occupied stream reaches, the length of discrete stream reaches, and the maximum occupied stream reach estimate and available literature (Service 2020, pp. 34–53). The Lower Tombigbee/Alabama Rivers (C) representation unit was categorized to have unknown resiliency (see discussion below regarding environmental DNA).

Environmental DNA (eDNA, which is DNA that is shed into the environment by an organism during its life) belonging to the frecklebelly madtom was collected in the Conasauga River (F1), Coosawattee River (F2), Etowah River (F3), and portions of the lower Alabama River (C2) and lower Tombigbee River (C1) (Freeman and Bumpers 2018, entire; Janosik and Whittaker 2018, entire). Within the Coosawattee River (F2), the lower Alabama River (C2), and the lower Tombigbee River (C1), eDNA is the only evidence of the species' presence within the period of record (1950–2019). Collecting and analyzing water samples for eDNA provides a means of rapidly surveying aquatic habitats to help identify potentially occupied sites for a species. However, uncertainty of these data revolves around the origin and fate of the individuals that shed the DNA and the length of time the eDNA persists in the environment. For the purposes of this analysis, we used eDNA data as evidence to support our conclusion that the probability of the species being present in a particular unit is greater than zero. As described above, we used occurrence data to assess resiliency. If units are known only from eDNA data, an unknown resiliency was determined since we have no occurrence information.

We assessed representation for the frecklebelly madtom as the number of resilient populations within a representation unit. Finally, we assessed frecklebelly madtom redundancy (ability of species to withstand catastrophic events) by evaluating the number and distribution of resilient populations throughout the species' range.

Current Condition of Frecklebelly Madtom

The historical range for the frecklebelly madtom includes two large river basins that enter into the Gulf of Mexico: The Pearl River Basin and the Mobile River Basin. The Pearl River Basin is in eastern Louisiana and southern Mississippi (identified as Pearl River (A) representation unit in the SSA). The Mobile River Basin consists of the Tombigbee River in eastern Mississippi and western Alabama (Upper Tombigbee (B) representation unit); the upper Alabama (Alabama

River (D) representation unit) and Cahaba Rivers (Cahaba River (E) representation unit) in central Alabama; the Etowah River (part of the Upper Coosa River (F) representation unit) in northern Georgia; and the Conasauga River (part of the Upper Coosa River (F) representation unit) in northern Georgia and southeastern Tennessee. Historically, the species was likely more widespread in the Mobile Bay drainage but was extirpated from large river habitats after the creation of numerous impoundments, and thus, the species' current representation has been reduced from historical levels. Currently, the species is known to be extant in four (Pearl River (A), Upper Tombigbee River (B), Cahaba River (E), and Upper Coosa River (F)) of the six representation units.

Within the Pearl River (A) representation unit, there are two resilience units (Bogue Chitto River (A1) and Pearl River (A2)) assessed to have high resiliency to stochastic events based on stable populations and complex range geometry with 15 occupied streams in the Pearl River. In addition, recent surveys (2009–2019) observed frecklebelly madtom at 83 percent of known historical sites (*i.e.,* any site in which the species was previously observed) (Wagner *et al.* 2018, entire; Service 2020, p. 59).

Within the Upper Tombigbee River (B) representation unit, there is one resilience unit (Buttahatchee River (B4)) assessed to have high resiliency, three (East Fork Tombigbee River (B1), Sipsey River (B2), and Luxapallila Creek (B3)) have moderate resiliency, and two are likely extirpated (Upper Tombigbee River (B6) and Bull Mountain Creek (B5)). The Buttahatchee River (B4) unit has been identified as a stronghold of the species where it has consistently been collected in higher numbers (Shepard *et al.* 1997, p. 23, Bennett *et al.* 2008, p. 470). For the East Fork of the Tombigbee River (B1) unit, the species has recent (2009–2019) collections of more than 100 individuals per survey event (*i.e.,* occurrence) of frecklebelly madtom. However, there has been a loss of habitat, altered water quality, and loss of connectivity in the East Fork with numerous structures installed for the Tennessee-Tombigbee Waterway (Tenn-Tom Waterway) (Millican *et al.* 2006, p. 3–4). Within the Sipsey River (B2) unit, experts have indicated that the habitat is excellent with few threats and the populations appear stable, albeit few records for them exist (Shepard *et al.* 1997, pp. 9, 23). Frecklebelly madtom persists in Luxapallila Creek (B3) with stable populations and recent (2009–2019) collections of almost 100 individuals per survey event (*i.e.,* occurrence).

Historically, the mainstem of the upper Tombigbee River (mainstem, B6) unit was considered to support robust populations of the frecklebelly madtom with some sites producing single collections of over 300 individuals during the assessment period from 1950–1987 (Bennet *et al.* 2008, p. 466; Service 2020, p. 49). However, the construction of the Tenn-Tom Waterway, a canal system that connects the Tombigbee River to the Tennessee River for commercial navigation, eliminated the suitable gravel-cobble habitat for the species (Shepard *et al.* 1997, p. 4). Despite fish assemblage surveys undertaken since the construction of the waterway (*e.g.,* Millican *et al.* 2006, entire), observations of the species cease in the mainstem of the upper Tombigbee River (B6) after 1980 (Bennett *et al.* 2008, p. 466), thus supporting the species' likely extirpation from this formerly occupied habitat. The frecklebelly madtom has not been observed in the Bull Mountain Creek (B5) unit since 1978–1987 assessment period; this unit was also drastically altered by the construction of the Tenn-Tom Waterway and is currently bisected by the canal system (Millican *et al.* 2006, p. 3). The habitat lost from this major construction and engineering activity has likely caused the extirpation of the frecklebelly madtom in the upper Tombigbee River (B6) (Millican *et al.* 2006 p. 84; Shepard 2004, p. 221; Bennett *et al.* 2008, p. 467) and Bull Mountain Creek (B5) (Shepard 2004, p. 221) resilience units.

Within the Lower Tombigbee/Alabama Rivers (C) representation unit, there are two resilience units (Lower Tombigbee River (C1) and Lower Alabama River (C2)) assessed to have unknown resiliency. There are no traditional occurrence data of this species for either resilience unit; however, eDNA of frecklebelly madtom was found in both units (Janosik and Whittaker 2018, p. 7).

Within the Alabama River (D) representation unit, there is one resilience unit (Alabama River (D1)) assessed to be likely extirpated. Following the construction of the Miller's Ferry Lock and Dam and Claiborne Dam in the late 1960s, there have been no occurrences of this species in the Alabama River (D1) unit, despite efforts to locate the species (Shepherd *et al.* 1997, p. 18).

Within the Cahaba River (E) representation unit, one resilience unit (Cahaba River (E1)) was estimated to have moderate resiliency to stochastic events. The Cahaba River system is believed to be a stronghold for the species (Neely 2018, p. 11) where it appears to be abundant (Bennet *et al.* 2008, p. 467). The Alabama River-Big Swamp Creek (E2) resilience unit is likely extirpated; no observations have been made of this species in the unit since the late 1960s after the construction of Miller's Ferry Lock and Dam and Claiborne Dam despite efforts to locate the species (Shepherd *et al.* 1997, p. 18; Bennet *et al.* 2008, p. 464).

Within the Coosa River (F) representation unit, one resilience unit (Conasauga River (F1)) was estimated to have low resiliency, one with moderate resiliency (Etowah River (F3)), and one with unknown resiliency (Coosawattee River (F2)). In the Conasauga River (F1), fish assemblage and abundance from the 1990s–2000s documented declines in several fish species, including the frecklebelly madtom, and after 2000, the frecklebelly madtom was no longer detected in fish surveys (Freeman *et al.* 2003, pp. 569–570; Bennett *et al.* 2008 p. 466). These surveys indicate a reduced resiliency in the Conasauga River (F1), because the best available occurrence data present a transition from a measurable population of the frecklebelly madtom to an unmeasurable one. Despite a 20-year lapse since the last observation of the frecklebelly madtom, the current presence of the species in the Conasauga River (F1) is supported by eDNA that was collected in 2017 and 2018 (Freeman and Bumper 2018, entire), as described above. Furthermore, the Conasauga River (F1) has not experienced the same type of habitat modifications as other rivers that have caused localized extirpation of the species (dams, impoundments, and channelization), and the species has been observed more recently in river surveys than in river sections where it is considered extirpated. Therefore, we determined that the species remains present in the Conasauga River but with low resiliency to stochastic events, as estimated from the occurrence data. Within the Etowah River (F3), frecklebelly madtom populations appear stable, albeit at lower levels of abundance, as the patterns of occurrence in the most recent time period is similar to time periods prior to 1998. There are no historical occurrence data or direct observations of the species from the Coosawattee River (F2) resilience unit. Environmental DNA for the frecklebelly madtom was found in portions of this unit (Freeman and Bumpers 2018, p. 9); therefore, we assessed this unit as having an unknown resiliency.

Overall, the frecklebelly madtom was assessed to have three units with high resiliency, five units with moderate resiliency, one unit with low resiliency, three units with unknown resiliency (eDNA only), and four units that are likely extirpated.

For species' redundancy, we assessed the number and distribution of resilient populations across the frecklebelly madtom's range, and we considered catastrophic events that could impact frecklebelly madtom. Catastrophic events may include chemical spills, large and rapid changes in upstream land use that alter stream characteristics and water quality downstream, new impoundments or other engineered devices that alter natural hydrological processes, and potential effects of climate change, such as drought and increases in occurrence of flash flooding events. Given the broad distribution of extant resilience units and several units assessed as having moderate to high resiliency, it is unlikely that a catastrophic event would impact the entire species' range. Therefore, the frecklebelly madtom exhibits a moderate to high degree of redundancy and that level of redundancy has remained relatively stable over time.

Risk Factors for Frecklebelly Madtom

We reviewed the potential risk factors (see discussion of section 4(a)(1) of the Act, above) that are affecting the frecklebelly madtom now and are expected to affect it into the future. We have determined that habitat destruction and degradation caused by agriculture and development resulting in poor water quality (Factor A) pose the largest risk to the current and future viability of the frecklebelly madtom. Other potential stressors to the species are habitat degradation resulting from channelization, dams, and impoundments (Factor A) and climate change (Factor E). We find the species does not face significant threats from overutilization (Factor B), disease or predation (Factor C), or invasive species (Factor E). We also reviewed the conservation efforts being undertaken for the habitat in which the frecklebelly madtom occurs. A brief summary of relevant stressors is presented below; for a full description, refer to chapter 4 of the SSA report (Service 2020, entire).

Water Quality

The frecklebelly madtom, like other benthic aquatic species, is sensitive to poor water quality (Warren *et al.* 1997, p. 125) and needs clean, flowing water to survive; thus water quality degradation is considered a threat to the species. Changes in water chemistry and flow patterns, resulting in a decrease in water quality and quantity have detrimental effects on madtoms, because they can render aquatic habitat unsuitable for occupancy.

Inputs of point (discharge from particular pipes) and nonpoint (diffuse land surface runoff) source pollution across the frecklebelly madtom range are numerous and widespread. Point source pollution can be generated from inadequately treated effluent from industrial plants, sanitary landfills, sewage treatment plants, active surface mining, drain fields from individual private homes, and others (Service 2000, pp. 14–15). Nonpoint pollution originates from agricultural activities, poultry and cattle feedlots, abandoned mine runoff, construction, failing septic tanks, and contaminated runoff from urban areas (Deutsch *et al.* 1990, entire; Service 2000, pp. 14–15). These sources contribute pollution to streams via sediments, heavy metals, fertilizers, herbicides, pesticides, animal wastes, septic tank and gray water leakage, and oils and greases. Water quality and native aquatic fauna decline as a result of this pollution through nitrification, decreases in dissolved oxygen concentration, increases in acidity and conductivity, or direct introduction of toxicants. These alterations likely have direct (*e.g.,* decreased survival and/or reproduction) and indirect (*e.g.,* loss, degradation, and fragmentation of habitat) effects. For some aquatic species, including the frecklebelly madtom, submergent vegetation provides critical spawning habitat for adults, refugia from predators, and habitat for prey of all life stages (Jude and Pappas 1992, pp. 666–667, Freeman *et al.* 2003, p. 54). Degraded water quality and the high algal biomass that result from pollutant inputs cause loss of these critical submergent plant species (Chow–Fraser *et al.*1998, pp. 38–39) that are vital habitat for the frecklebelly madtom.

The frecklebelly madtom is intolerant to sedimentation (Shepard 2004, p. 221; MMNS 2014, p. 35), and sedimentation is a concern throughout the species' range. Researchers have documented a negative relationship between occurrence of the frecklebelly madtom and human-induced increases of sediment within the upper Tombigbee River (mainstem), Alabama River, Cahaba River, Luxapallila Creek, Etowah River, and Conasauga River (Burkhead *et al.* 1997, pp. 406–413; Shepherd *et al.* 1997, pp. 15–19; Freeman *et al.* 2002, pp. 18–19; Freemen *et al.* 2017, pp. 429–430). Human-induced increases in sediment are likely a factor in local declines of the species. In addition, the frecklebelly madtom's habitat requirements make it vulnerable to activities that disturb substrate integrity. The species is restricted to habitat with pea-sized gravel, cobble, or slab-rock substrates not embedded in large amounts of silt (Bennett *et al.* 2008, p. 467; Bennett and Kuhajda. 2010, p. 510), although it has also been found to occupy some stable streams with a sandy yet stable substrate. Degradation from sedimentation, physical habitat disturbance, and contaminants threaten the habitat and water quality on which the frecklebelly madtom depends. Sedimentation from an array of land uses (*e.g.,* urbanization, agriculture, channel maintenance activities) could 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.

A wide range of current activities and land uses, including agricultural practices, construction, stormwater runoff, unpaved roads, poor forest management, utility crossings, and mining, can lead to excessive sedimentation within streams. Fine sediments not only smother streams during current ongoing activities, historical land use practices may have substantially altered hydrological and geological processes such that sediments continue to be input into streams for several decades after those activities cease (Harding *et al.* 1998, p. 14846).

Water quality for frecklebelly madtom is particularly impacted by three processes: Channel modification (*i.e.,* dredging and channelization), agriculture, and development, which are further discussed below.

Channel Modification

Dredging and channelization have led to loss of aquatic habitat in the Southeast (Neves *et al.* 1997, p. 71). Dredging and channelization projects are extensive throughout the region for flood control, navigation, sand and gravel mining, and conversion of wetlands into croplands (Neves *et al.* 1997, p. 71; Herrig and Shute 2002, pp. 542–543). Dredging and channelization modify and destroy habitat for aquatic species by destabilizing the substrate, increasing erosion and siltation, removing woody debris, decreasing habitat heterogeneity, and stirring up contaminants that settle onto the substrate (Williams *et al.* 1993, pp. 7–8; Buckner *et al.* 2002, entire; Bennett *et*

al. 2008, pp. 467–468). Channelization can also lead to head cutting (an erosional process in a stream channel with a vertical cut or drop that migrates upstream over time), which causes further erosion and sedimentation (Hartfield 1993, pp. 131–141). Dredging can involve snagging (the removal of woody debris from the channel), which not only contributes to destabilization of the channel but also removes the woody debris that provides important cover and nest locations for many fish species, including the frecklebelly madtom (Bennett *et al.* 2008, pp. 467–468).

The frecklebelly madtom was eliminated from much of the mainstem of the Tombigbee River after the construction of the Tenn-Tom Waterway. Tributaries to the upper Tombigbee River have also been affected by channel modification of the Tenn-Tom Waterway due to head cutting and other geomorphic and flow modifications (Raborn and Schramm 2003, pp. 289–301; Roberts *et al.* 2007, pp. 250–256; Tipton *et al.* 2004, pp. 49–61), and fewer tributaries currently maintain the habitat needed by the frecklebelly madtom in this system (Millican *et al.* 2006, p. 84; Shepard 2004, pp. 220–222; Shepard *et al.* 1997, pp. 3–4). Similarly, channel geomorphology and substrate are likely being affected by head cutting due to impoundment of the Alabama River (Bennett *et al.* 2008, p. 468).

Alternatively, frecklebelly madtom abundances have remained stable in the Cahaba River throughout the modification periods that affected surrounding drainages. The Cahaba River, Conasauga River, and some tributaries to the upper Tombigbee River are the only remaining waters within the range of the frecklebelly madtom that have escaped large-scale human modification through damming or channelization (Bennet *et al.* 2008, p. 468).

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 eroding 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 agricultural areas rather than forested areas. Contaminants associated with agriculture (*e.g.,* fertilizers, pesticides, herbicides, and animal waste) can degrade water quality and negatively impact instream habitats by causing oxygen deficiencies, excess nutrification, and excessive algal growths, which can have a direct impact on fish community composition (Petersen *et al.* 1999, p. 6).

Areas within the current range of the frecklebelly madtom, which are predominantly agricultural, are impacted by nonpoint source sediment and agrochemical discharges altering the physical and chemical characteristics of its habitat, thus potentially impeding its ability to feed, seek shelter from predators, and successfully reproduce. A negative relationship between the species and nonpoint source stressors attributed to agriculture has been described particularly within the Conasauga River (Freeman *et al.* 2017, pp. 429–430). Over the past two decades, an increase in the use of agricultural chemicals and practices, such as use of glyphosate-based herbicides for weed control and land dispersion of animal waste for soil amendment, has corresponded with marked declines in populations of fish and mussel species in the Upper Conasauga River watershed in Georgia and Tennessee (Freeman *et al.* 2017, p. 429). Nutrient enrichment of streams was found to be widespread with high levels of nitrate and phosphorus (reported at over 5 milligrams per liter and over 300 micrograms per liter, respectively, within the Conasauga River) likely associated with eutrophication, and hormone concentrations in sediments were often above those shown to cause endocrine disruption in fish, which was possibly related to the widespread application of poultry litter and manure (Lasier *et al.* 2016, entire). Estrogens, a hormone and type of endocrine disruptor that can be found in poultry litter, also have been identified as a threat to aquatic fauna in the Conasauga River system (Jacobs 2015, entire). Increased levels of estrogens can lead to decreases in spawning success and potentially population collapse within short timeframes (Kidd *et al.* 2007, p. 8899). Aquatic species declines observed in the Conasauga watershed may be at least partially due to hormones, as well as excess nutrients, herbicides, and surfactants (Freeman *et al.* 2017, p. 429).

The amount (acreage) of agricultural land is declining across the eastern United States with a net loss of 6.5 percent between 1973 and 2000 (Sayler *et al.* 2016, p. 12). As discussed below under *Future Scenarios,* within the watersheds in which frecklebelly madtom occurs, the declining trend of agricultural land is consistent with broader trends in the eastern United States showing agricultural land declines with time (Sayler *et al.* 2016, p. 12). These agricultural lands are mostly being converted to developed and forested lands (Sayler *et al.* 2016, p. 12). Despite the declining trend, agricultural practices leading to poor water quality conditions currently influence and will continue to influence the viability of frecklebelly madtom across its range.

Development

Development is a significant source of water quality degradation that can reduce the survival of aquatic organisms, including the frecklebelly madtom. Urban development can stress aquatic systems in a variety of ways, including increasing the frequency and magnitude of high flows in streams; increasing sedimentation and nutrient loads; increasing contaminants and toxicity; decreasing the diversity of fish, aquatic insects, plants, and amphibians; and changing stream morphology and water chemistry (Coles *et al.* 2012, entire; CWP 2003; entire). Sources and risks of an acute or catastrophic contamination event, such as a leak from an underground storage tank or a hazardous materials spill on a highway, increase as urbanization increases.

Urbanization has also been shown to impair stream quality by impacting riparian health (Diamond *et al.* 2002, p. 1150). Riparian impairment resulting from urbanization or agricultural land use can amplify negative effects of nonpoint source pollution within the watershed as well as impact stream quality independent of land use within the watershed. Impacts from impervious cover can be mitigated through riparian forest cover and good riparian health (Roy *et al.* 2005, p. 2318; Walsh *et al.* 2007, entire); however, the benefit of the riparian cover diminishes when impervious cover (*i.e.,* urban cover) exceeds approximately 10 percent within the watershed (Booth and Jackson 1997, p. 1084; Goetz *et al.* 2003, p. 205).

Currently, larger population centers, such as the cities of Atlanta, Georgia, Jackson, Mississippi, and Birmingham, Alabama, contribute substantial runoff to the watersheds occupied by the frecklebelly madtom. In the future, urbanization is predicted to increase in several areas across the range of the frecklebelly madtom (see below under *Future Scenarios*). All watersheds, but especially the Etowah River watershed, upstream of Lake Allatoona in Georgia are expected to experience additional urbanization (Albanese *et al.* 2018, p. 39). Conservation concerns in the Etowah River watershed have focused on potential effects of this predicted urban growth on imperiled fishes

(Burkhead *et al.* 1997, pp. 959–968; Wenger *et al.* 2010, pp. 11–21), and previous analyses show negative correlations between occurrence of native fishes and increases in impervious cover associated with urban development (Wenger *et al.* 2008, p. 1260). In the Etowah Basin in Georgia, models indicated that urbanization lowered fish species richness and density and led to predictable changes in species composition. Darters, sculpin, minnows, and endemic species declined along the urban gradient, whereas sunfishes persisted and became the dominant group (Walters *et al.* 2005, pp. 10–11). In the future, we anticipate increased development to amplify as a population-level factor influencing the viability of frecklebelly madtom.

Impoundments

Impoundment of rivers is a stressor to aquatic species in the southeast (Benz and Collins 1997, pp. 22–23, 63, 91, 205, 273, 291, 397, 399, 401–406, 446; Buckner *et al.* 2002, pp. 10–11). Dams modify habitat conditions and aquatic communities both upstream and downstream of an impoundment (Winston *et al.* 1991, pp. 103–104; Mulholland and Lenat 1992, pp. 193–231; Soballe *et al.* 1992, pp. 421–474). 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. Sedimentation alters substrate conditions by filling in interstitial spaces between rocks, which provide habitat for many species (Neves *et al.* 1997, pp. 63–64), including the frecklebelly madtom. Downstream of dams, flow regime fluctuates with resulting fluctuations in water temperature and dissolved oxygen levels, the substrate is scoured, and downstream tributaries are eroded (Neves *et al.* 1997, pp. 63–64; Schuster 1997, p. 273; Buckner *et al.* 2002, p. 11). Negative ''tailwater'' effects on habitat can extend many kilometers downstream (Neves *et al.* 1997, p. 63). Dams fragment habitat for aquatic species by blocking corridors for migration and dispersal, resulting in population isolation and heightened susceptibility to extinction (Neves *et al.* 1997, p. 63). Dams also preclude the ability of aquatic organisms to escape from polluted waters and accidental spills (Buckner *et al.* 2002, p. 10).

Damming of streams and springs is also extensive throughout the Southeast and occurs within the large river habitats of the frecklebelly madtom (Etnier 1997, pp. 88–89; Morse *et al.* 1997, pp. 22–23; Shute *et al.* 1997, pp. 458–459, Bennett *et al.* 2008, p. 467). Many streams have both small ponds in their headwaters and large reservoirs in their lower reaches (Morse *et al.* 1997, p. 23). Small streams on private lands are regularly dammed to create ponds for cattle, irrigation, recreation, and fishing, with significant ecological effects due to the sheer abundance of these structures (Morse *et al.* 1997, pp. 22–23). In addition, small headwater streams are increasingly being dammed in the Southeast to supply water for municipalities (Buckner *et al.* 2002, p. 11).

Dams are known to have caused the extirpation and extinction of many southeastern species, and existing and proposed dams pose an ongoing threat to many aquatic species (Folkerts 1997, p. 11; Neves *et al.* 1997, p. 63; Riciarddi and Rasmussen 1999, p. 1222; Service 2000, p. 15; Buckner *et al.* 2002, p. 11, Olden 2016, pp. 112–122), including the frecklebelly madtom. The construction of 10 lock and dam structures on the Tenn-Tom Waterway, which artificially connects the Tennessee River to the Gulf of Mexico, led to the extirpation of many species, including the frecklebelly madtom, from the main river channel (Bennett *et al.* 2008, p. 467). The frecklebelly madtom is considered extirpated from the Alabama River, likely due to the construction of three dams in the late 1960s and early 1970s (Bennett *et al.* 2008, p. 467). In addition, the construction of one dam on the Etowah River may have affected the frecklebelly madtom, since the species is dependent on large-river gravel shoal substrate (Bennett *et al.* 2008, p. 470). As discussed above in *Current Condition of Frecklebelly Madtom,* four resilience units are likely extirpated as a result of dam construction and large scale river modifications.

Climate Change

In the southeastern United States, several climate change models have projected more frequent drought, more extreme heat (resulting in increases in air and water temperatures), increased heavy precipitation events (*e.g.,* flooding), more intense storms (*e.g.,* frequency of major hurricanes increases), and rising sea level and accompanying storm surge (IPCC 2013, entire). When taking into account future climate projections for temperature and precipitation where the frecklebelly madtom occurs, warming is expected to be greatest in the summer, which is predicted to increase drought frequency. Nevertheless, annual mean precipitation is expected to increase slightly, leading to a slight increase in flooding events (Alder and Hostetler 2013, unpaginated; IPCC 2013, entire; USGS 2020, unpaginated). Changes in climate may affect ecosystem processes and communities by altering the abiotic conditions experienced by biotic assemblages, resulting in potential effects on community composition and individual species interactions (DeWan *et al.* 2010, p. 7).

The frequency, duration, and intensity of droughts are likely to increase in the southeastern United States as a result of global climate change (Konrad *et al.* 2013, p. 34), which could negatively affect stream flows in the region. Stream flow is strongly correlated with important physical and chemical parameters that limit the distribution and abundance of riverine species (Power *et al.* 1995, entire; Resh *et al.* 1988, pp. 438–439) and regulates the ecological integrity of flowing water systems (Poff *et al.* 1997, p. 770).

To understand how climate change is projected to affect where frecklebelly madtom occurs, we used the National Climate Change Viewer (NCCV), a climate-visualization tool developed by the U.S. Geological Survey (USGS), to generate future climate projections across the range of the species. The NCCV is a web-based tool for visualizing and assessing projected changes in climate and water balance at watershed, State, and county scales (USGS 2020, unpaginated). To evaluate the effects of climate change in the future, we used projections from Representative Concentration Pathway (RCP) 4.5 and RCP 8.5 to characterize projected future changes in climate and water resources, averaged for the South-Atlantic Gulf Region encompassing the range of the frecklebelly madtom (Service 2020, pp. 27–31). The projections estimate changes in mean annual values for maximum air temperature, minimum air temperature, monthly precipitation, and monthly runoff, among other factors, from historical (1981–2010) to future (2050–2074) time series.

Within the range of the frecklebelly madtom, the NCCV projects that, under the RCP 4.5 scenario, maximum air temperature will increase by 1.9 degrees Celsius (°C) (3.4 degrees Fahrenheit (°F)), minimum air temperature will increase by 1.8 °C (3.2 °F), precipitation will increase by 5.36 millimeters (0.2 inches) per month, and runoff will remain the same in the 2050–2074 time period (USGS 2020, unpaginated). Under the more extreme RCP 8.5 scenario, the NCCV projects that maximum air temperature will increase by 2.8 degrees Celsius (°C) (5 degrees Fahrenheit (°F)), minimum air

temperature will increase by 2.7 °C (4.9 °F), precipitation will increase by 5.36 millimeter (0.2 inches) per month, and runoff will remain the same in the 2050–2074 time period (USGS 2020, unpaginated). These estimates indicate that, despite projected minimal increases in annual precipitation, anticipated increases in maximum and minimum air temperatures will likely offset those gains. Based on these projections, the frecklebelly madtom will on average be exposed to increased air temperatures across its range, despite limited increases in precipitation; however, these projections are not a one-to-one air to stream water temperature comparison.

Despite the recognition of climate effects on ecosystem processes, there is uncertainty within each model and model ensembles about what the exact climate future will be, and there is uncertainty in how the ecosystems and species will respond. Although there are several potential risks associated with long-term climate change as described above, there is uncertainty regarding how the frecklebelly madtom will respond to these risks. The species occupies some tributaries throughout its range, but the frecklebelly madtom has a preference for habitat in larger rivers and this may provide a buffer to changes induced by climate change, particularly from issues associated with drought. Therefore, we do not consider climate change to be a primary risk factor for the species at this time.

Conservation Efforts

The frecklebelly madtom is recognized as a species of concern in all States where it occurs and is protected by State statute in four States where it occurs. This species is listed as endangered by the State of Georgia (GADNR 2015, p. 74), endangered by the State of Mississippi (Mississippi Museum of Natural Science 2015, p. 36), and threatened by the State of Tennessee (TWRA 2015, Appendix C). In Alabama, the frecklebelly madtom is designated as a protected nongame species under Alabama Code 220–2–.92. In general, the protections accorded to the frecklebelly madtom by Mississippi, Alabama, Georgia, and Tennessee prohibit direct exploitation of the species without a permit within those States.

Beginning in 2017, the Private John Allen National Fish Hatchery partnered with the Mississippi Department of Wildlife Fisheries and Parks to collect individuals of the frecklebelly madtom within that State to study marking techniques, establish captive husbandry methods, and conduct life-history studies. This effort has led to successful propagation of the species, documented important components of the species' life history, and collected data that can be used to develop long-term, captive-propagation efforts, although no individuals have been released.

Throughout the range of the species, portions of occupied rivers and surrounding lands are owned and managed by State and Federal entities that prioritize conservation as a management objective. Generally, these entities help to maintain the natural ecosystem functioning of a river by managing terrestrial areas in a more natural state and limiting disturbance adjacent to rivers. However, properties managed by the Service, U.S. Forest Service, and the Dawson Forest Wildlife Management Area (WMA) managed by the Georgia Department of Natural Resources, are known to specifically consider and manage for the conservation of aquatic species and their habitats. It is expected that the frecklebelly madtom will be positively affected by management on these lands. These conservation lands and the adjacent rivers occupied by the frecklebelly madtom include: Portions of the Bogue Chitto and Pearl Rivers within the Bogue Chitto National Wildlife Refuge (NWR, Service) in Louisiana; portions of the Bogue Chitto River within Bogue Chitto State Park (Louisiana Department of Culture, Recreation, and Tourism) in Louisiana; portions of the Pearl River within the Pearl River WMA (Louisiana Department of Wildlife and Fisheries) in Louisiana; portions of the Cahaba River within the Cahaba NWR (Service) in Alabama; portions of the Conasauga River within the Cherokee National Forest (U.S. Department of Agriculture (USDA) U.S. Forest Service) in Georgia; and portions of the Etowah River within the Dawson Forest WMA (Georgia Department of Natural Resources) in Georgia. In addition, the Etowah River catchment area upstream of habitat occupied by the frecklebelly madtom and managed by the Chattahoochee-Oconee National Forest (USDA U.S. Forest Service) is expected to benefit the species by providing good water quality to lower river reaches.

The Natural Resources Conservation Service (NRCS), USDA, designated the Conasauga River as a Working Lands for Wildlife (WLFW) landscape in 2017 (USDA 2020, unpaginated) and will provide additional funds and human-power to improve water quality and aquatic habitat in the watershed. The project will provide technical and financial assistance to help landowners improve water quality and help producers plan and implement a variety of conservation activities or practices that benefit aquatic species. The frecklebelly madtom will likely benefit from water quality improvements in portions of the Conasauga River that are affected by agricultural practices implemented through the WLFW project.

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 condition 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 condition (see below) 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.

In addition to impacting frecklebelly madtom individually, it is possible that several of the above summarized risk factors are acting synergistically or cumulatively on the species. The combined impact of multiple stressors is likely more harmful than a single stressor acting alone. The dual stressors of climate change and direct human impact have the potential to affect aquatic ecosystems by altering stream flows and nutrient cycles, eliminating habitats, and changing community structure (Moore *et al.* 1997, p. 942). Increased water temperatures and a reduction in stream flow are the climate change effects that are most likely to affect stream communities (Poff 1997, entire), and each of these variables is strongly influenced by land use patterns. For example, in agricultural areas, lower precipitation may trigger increased irrigation resulting in reduced stream flow (Backlund *et al.* 2008, pp. 42–43). In forested areas, trees influence instream temperatures through the direct effects of shading. Reductions in temperature by vegetative cover may be particularly important in low-order streams, where canopy vegetation significantly reduces the magnitude and

variation of the stream temperature compared with that of clear-cut areas (Ringler and Hall, 1975, pp. 111–121).

Future Scenarios

To evaluate the future viability of the frecklebelly madtom and address uncertainty associated with the degree and extent of potential future stressors and their impacts to the madtom, we analyzed three future scenarios and assessed the resiliency, representation, and redundancy of the madtom for each scenario. We devised these scenarios by identifying information on the following primary threats that are anticipated to affect the frecklebelly madtom in the future: Agriculture and developed land use. We considered projected changes in agricultural and developed land uses in assessing future resiliency of each resilience unit for frecklebelly madtom. We assessed these land uses to understand the future impacts to habitat degradation and destruction resulting from poor water quality, a primary threat to frecklebelly madtom. The three scenarios capture the range of variability in the changing human population footprint on the landscape and how frecklebelly madtom populations will respond to these changing conditions. All three scenarios were projected out to the year 2050 (*i.e.,* 30 years), because we were reasonably certain we could forecast patterns in land-use change and understand how these land uses will interact with the frecklebelly madtom and its habitat over this time period given the species' life span.

In our development of future scenarios, we used projected trends in land use change from two models, the National Land Cover Database (NLCD) and the Slope, Land use, Excluded, Urban, Transportation and Hillshade (SLEUTH) model (Jantz *et al.* 2010, entire). Future projections for agricultural land use were developed from NLCD data by calculating a 15-year trend in agricultural land use change between 2001 and 2016 for each resilience unit and converting that to an annual rate of agricultural land use change for each resilience unit. We used the annual rate of agricultural land use change to project changes to 30 years from the present. The annual rate of agricultural land use change was held constant for each resilience unit across all scenarios; however, the rate of change in agricultural area varied among the resilience units we evaluated in our analysis. With the exception of the Alabama River resilience unit, which has an increase in the amount of agricultural land use over time, we found an overall decline in the amount of land used for agriculture. This result is consistent with broader trends that show the amount of agricultural land is declining with time in the eastern United States (Sayler *et al.* 2016, p. 12).

For our future developed land use projections, we used the SLEUTH datasets from the year 2050 (closest to 30 years in the future) and examined development across resilience units. We then developed three scenarios that varied development probabilities: (1) Low development, (2) moderate development, and (3) high development. For the low development scenario, we considered all areas predicted to be developed at a greater than 90 percent probability (*i.e.,* only including areas that are almost certain to be developed); the moderate development scenario considered all areas to be developed at a greater than 50 percent probability; and the high development scenario considered all areas to be developed at a greater than 10 percent probability (*i.e.,* including the majority of areas with any potential to be developed). The results of the future projections for agriculture and developed land use were used to estimate a composite land use score, and then using a rule set, we categorized future resiliency into high, moderate, low, unknown, or likely extirpated conditions.

In the low development scenario, the frecklebelly madtom was projected to have one unit with high resiliency, seven units with moderate resiliency, one unit with low resiliency, and four units that are likely extirpated (see table 2, below). In terms of projected change from current condition, the Buttahatchee River (B4) and Pearl River (A2) resilience units are projected to decrease in resiliency from high to moderate. The Etowah River (F3) resilience unit is projected to become more developed, although the percent of developed land does not reach a point where a change in resiliency is anticipated. All other units are projected to retain their current resiliency under the low development scenario.

TABLE 2—FUTURE RESILIENCY OF FRECKLEBELLY MADTOM RESILIENCE UNITS UNDER THREE FUTURE SCENARIOS

Representation units	Resilience units	Current	Scenario 1	Scenario 2	Scenario 3
Pearl River (A)	Bogue Chitto River (A1)	High	High	High	High.
	Pearl River (A2)	High	Moderate	Moderate	Moderate.
Upper Tombigbee River (B)	East Fork Tombigbee (B1)	Moderate	Moderate	Moderate	Moderate.
	Sipsey River (B2)	Moderate	Moderate	Moderate	Moderate.
	Luxapallila Creek (B3)	Moderate	Moderate	Moderate	Moderate.
	Buttahatchee River (B4)	High	Moderate	Moderate	Moderate.
	Bull Mountain Creek (B5)	Likely Extirpated	Likely Extirpated	Likely Extirpated	Likely Extirpated.
	Upper Tombigbee River (mainstem) (B6).	Likely Extirpated	Likely Extirpated	Likely Extirpated	Likely Extirpated.
Lower Tombigbee/Alabama Rivers (C)	Lower Tombigbee River (C1)	Unknown*	Unknown*	Unknown*	Unknown.*
	Lower Alabama River (C2)	Unknown*	Unknown*	Unknown*	Unknown.*
Alabama River (D)	Alabama River (D1)	Likely Extirpated	Likely Extirpated	Likely Extirpated	Likely Extirpated.
Cahaba River (E)	Cahaba River (E1)	Moderate	Moderate	Moderate	Moderate.
	Alabama River/Big Swamp (E2)	Likely Extirpated	Likely Extirpated	Likely Extirpated	Likely Extirpated.
Upper Coosa River (F)	Conasauga River (F1)	Low	Low	Low	Likely Extirpated.
	Coosawattee River (F2)	Unknown*	Unknown*	Unknown*	Unknown.*
	Etowah River (F3)	Moderate	Moderate	Low	Low.

* Resiliency determined as unknown since units are known only from eDNA data.

In the moderate development scenario, the frecklebelly madtom was projected to have one unit with high resiliency, six units with moderate resiliency, two units with low resiliency, and four units that are likely extirpated (see table 2, above). In terms of projected change from current condition, the Buttahatchee River (B4) and Pearl River (A2) resilience units are projected to decrease in resiliency from high to moderate. The Etowah River (F3) resilience unit is projected to become substantially more developed under this scenario, and, therefore, this unit is projected to decrease in resiliency from moderate to low. All other units are projected to retain their current resiliency.

In the high development scenario, the frecklebelly madtom was projected to

have one unit with high resiliency, six units with moderate resiliency, one unit with low resiliency, and five units that are likely extirpated (see table 2, above). In terms of projected change from current condition, the Buttahatchee River (B4) and Pearl River (A2) resilience units are projected to decrease in resiliency from high to moderate. The Etowah River (F3) resilience unit is projected to become substantially more developed under this scenario; therefore, this unit is projected to decrease in resiliency from moderate to low. The Conasauga River (F1) resilience unit is projected to decrease in resiliency from low to being likely extirpated as a result of high levels of both agriculture and developed land uses. All other units are projected to retain their current resiliency.

In summary, the resiliency of frecklebelly madtom resilience units are projected to remain similar to the current condition with eight units having moderate to high resiliency under the low development scenario (Service 2020, entire). In the moderate and high development scenarios, seven units are projected to have moderate to high resiliency; two units are projected to have low resiliency (one unit is low under current condition) in the moderate development scenario and one additional unit is projected to be likely extirpated (total of five units) in the high development scenario. The Pearl River (A) representation unit continues to be the stronghold for the species, as resiliency is projected to remain high in the Bogue Chitto (A1) resilience unit across all scenarios and the Pearl River (A2) resilience unit is projected to have moderate resiliency across all scenarios. All extant resilience units in the Upper Tombigbee (B) representation unit are projected to have moderate resiliency. The Cahaba River (E1) resilience unit is projected to maintain moderate resiliency into the future.

Within the Upper Coosa River (F) representation unit, the Etowah River (F3) resilience unit is projected to become more developed by 2050 under all scenarios; therefore, in the moderate and high development scenarios, the resiliency is projected to decrease from moderate to low, making the unit more vulnerable to stochastic events. The high level of development projected within riparian areas of the Etowah River (F3) unit will lead to an increase in impervious area, which could lead to further decreases in water quality and impact the persistence of frecklebelly madtom. In addition, although the agricultural trend projects a decrease, the amount of land in agricultural use is still projected to remain relatively high. High levels of agriculture and developed land use projections in this unit drive the projected low resiliency by the year 2050. In the Conasauga River (F1) resilience unit, developed land use under the high development scenario is projected to increase, and agriculture and developed land use are projected to be at relatively high levels by 2050. However, the Conasauga River (F1) resilience unit currently has low resiliency, and this projected increase in development is anticipated to further impact resiliency, resulting in likely extirpation of the frecklebelly madtom from this unit.

Finally, the presence of frecklebelly madtom in the Lower Tombigbee River (C1), Lower Alabama River (C2), and Coosawattee River (F2) resilience units is based on recent positive eDNA samples, and these units have been assessed as having an unknown resiliency. Based on our assessment of future land use, threat levels from agriculture and developed land use are projected to be relatively low in the Lower Tombigbee (C1) and Lower Alabama (C2) resilience units. Thus, if the species is present, there is no projected increase in threats related to agriculture or developed land use. In the Coosawattee River (F2) resilience unit, there is projected to be relatively high amounts of agricultural and developed land. If the species is present there, this land use pattern could represent a threat to the individuals occupying the unit.

Future species' representation is projected to maintain current levels in the low development scenario, as the only projected changes in resiliency are two units decreasing from high to moderate resiliency. Under the moderate and high development scenarios, the Etowah River (F3) and Conasauga River (F1) units are projected to decrease in resiliency. Therefore, the Upper Coosa River (F) representation unit is projected to be vulnerable to extirpation, resulting in a loss of species' representation. Given this unit occurs in a unique physiographic province and has populations considered as an evolutionary significant unit (Neely 2018, pp. 7–10), the projected loss of this unit would result in a lower level of representation for the species.

Species redundancy is projected to maintain current levels into the future under the low and moderate development scenarios, as no additional resilience units are projected to become extirpated. In the Upper Coosa River (F) representation unit, two resilience units are projected to decrease in resiliency under the moderate and high scenarios. Therefore, frecklebelly madtom in these units are at an increased risk of extirpation from a catastrophic event. Given the broad distribution of moderate to high resilience units, it is unlikely that a catastrophic event would impact the entire species' range.

Determination of Frecklebelly Madtom'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 ''endangered species'' or ''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 a species meets the definition of ''endangered species'' or ''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 frecklebelly madtom. We considered whether the frecklebelly madtom is presently in danger of extinction. Our review of the best available information indicates there are 16 resilience units of frecklebelly madtom within 6 representation units across the known historical range in Louisiana, Mississippi, Alabama, Georgia, and Tennessee. The species was likely more widespread historically in the Mobile Bay drainage but was extirpated from large river habitats after the creation of numerous impoundments. Currently, eight resilience units (62 percent) of frecklebelly madtom have moderate to high resiliency and are contributing to the viability of the species; impacts from habitat destruction and modification do not appear to be affecting the frecklebelly madtom at the population-level for these resilience units. Five units (38 percent) have low resiliency or are likely extirpated due to habitat destruction and degradation resulting from channelization, dams, and

impoundments, and these units are not currently contributing to the frecklebelly madtom's viability. Three units have unknown resiliency as these units have no direct observations of the species and are known only from eDNA presence surveys. The species is currently extant in four of the six representation units with at least one resilience unit having moderate to high resiliency in each of the four representation units. Given the broad distribution of the species and eight units across the range having moderate to high resiliency, a single catastrophic event is not likely to impact the species as a whole. Therefore, the frecklebelly madtom across its range is currently at a low risk of extinction from habitat destruction and other stressors. Thus, we determine that proposing an endangered status for the species is not appropriate.

We forecasted the viability of the frecklebelly madtom under three plausible scenarios 30 years into the future (summarized above in *Future Scenarios*). We assessed relevant risk factors that may be acting on the frecklebelly madtom in the future and whether we could make reliable predictions about these factors and how they may impact the viability of the species. We assessed how agriculture and developed land use is projected to influence the viability of the frecklebelly madtom 30 years in the future (2050). Based on the modeling and scenarios evaluated, we considered our ability to make reliable predictions in the future and the uncertainty in how and to what degree the species could respond to those risk factors in this timeframe. Based on this information, we determine the appropriate timeframe for assessing whether this species is likely to become in danger of extinction in the foreseeable future is 30 years.

Taking into account the impacts of the primary factors influencing the species in the future (habitat destruction and degradation caused by agriculture and developed land uses resulting in poor water quality) and the potential impacts to the species' needs, we project the frecklebelly madtom will continue to remain resilient to stochastic events across much of its range. We project that numerous resilience units will have moderate to high resiliency over the next 30 years across the broad geographic range of the species, including within the four currently extant representation units, depending on scenario. Although two of our scenarios indicated a decline in the number of resilience units contributing to viability of the frecklebelly madtom, eight units in the low development scenario and seven units in the moderate and high development scenarios are projected to remain viable through 2050. With the projected lower resiliency from habitat destruction and degradation within the Upper Coosa River (F) representation unit, the species' representation and redundancy is lower than current levels. However, the geographically wide distribution of resilience and representation units guards against catastrophic losses rangewide. We find the multiple resilience units across multiple representation units provide resiliency, representation, and redundancy levels that are likely sufficient to sustain the species into the foreseeable future. Therefore, we find that the risk of extinction of the frecklebelly madtom is sufficiently low that it is unlikely to become endangered within the foreseeable future, *i.e.,* within the next 30 years.

After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we conclude that the risk factors acting on the frecklebelly madtom and its habitat, either singly or in combination, are not of sufficient imminence, scope, or magnitude to rise to the level to indicate that the species is in danger of extinction now (an endangered species), or likely to become endangered within the foreseeable future (a threatened species), 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. Having determined that the frecklebelly madtom is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we now consider whether it may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range—that is, whether there is any portion of the species' range for which it is true that both (1) the portion is significant; and (2) the species is in danger of extinction now or likely to become so in the foreseeable future 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.

In undertaking this analysis for the frecklebelly madtom, we chose 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 any portions of the range where the species is endangered or threatened. We considered whether any of the threats acting on the frecklebelly madtom are geographically concentrated in any portion of the range at a biologically meaningful scale.

We identified two portions of the species' range that may be experiencing a concentration of threats. First, the Upper Tombigbee River (B) representation unit of the frecklebelly madtom may be experiencing elevated threats resulting from construction of the Tenn-Tom Waterway (Factor A). The construction of the Tenn-Tom Waterway for commercial navigation eliminated suitable habitat for the frecklebelly madtom and has caused the likely extirpation of two of six resilience units in the Upper Tombigbee River (B) representation unit: Upper Tombigbee River (B6) and Bull Mountain Creek (B5). We evaluated current status information and concluded that the species is effectively extirpated from these two resilience units. Because we considered these extirpated units to be lost historical range, they cannot be considered as a significant portion of the range. However, we considered the effects that the loss of these two units have on the current and future viability of the frecklebelly madtom in the Upper Tombigbee River (B) representation unit. We then considered the current status of the remaining four resilience units in the Upper Tombigbee River representation unit (B), which currently have moderate to high resiliency, including the Buttahatchee River (B4)—considered a stronghold for the species. In addition, the East Fork Tombigbee River (B1) resilience unit has moderate resiliency with recent collections of over 100 individuals despite some habitat impacts from the Tenn-Tom Waterway. These four units are projected to have continued moderate resiliency into the foreseeable future. Based on these facts, we conclude that the impacts from the Tenn-Tom Waterway are not having any biologically meaningful effect on the remaining four resilience units in the Upper Tombigbee River representation unit (B), which indicates the species does not have a different status in that portion of its range. Therefore, even if the Upper Tombigbee River (B) representation unit was found to

comprise a significant portion of the frecklebelly madtom's range, we conclude that the species is not in danger of extinction or likely to become so in the foreseeable future in that portion.

We identified another portion, the Upper Coosa River (F) representation unit, of the frecklebelly madtom's range that is experiencing a concentration of the following threat, but at a biologically meaningful scale: Habitat destruction and degradation from agriculture and developed land uses resulting in poor water quality (Factor A). Currently, within the Upper Coosa River (F) representation unit, two resilience units (Conasauga River (F1) and Etowah River (F3)) have low and moderate resiliency, respectively; the Coosawattee (F2) resilience unit was determined to have an unknown resiliency as the species was not historically known to occur in this river, but eDNA for the frecklebelly madtom was found in portions of this unit in 2018. Declines from historical condition in frecklebelly madtom occurrences have been apparent in the Conasauga River (F1) resilience unit, while occurrence records in the Etowah River (F3) resilience unit are fairly widespread and considered similar to historical occurrence records. Given the current resiliency of units within the Upper Coosa River (F) representation unit, it is not likely a single catastrophic event would result in the extirpation of the species from this portion.

In the foreseeable future, we project the Upper Coosa River (F) representation unit will have declines in resiliency for both the Conasauga River (F1) and Etowah River (F3) resilience units due to habitat destruction and degradation from agriculture and developed land use. Although this threat is not unique to the Upper Coosa River (F) representation unit, the threat in this portion is great enough to project a reduction in resiliency for both of these resilience units, and, therefore, the entire representation unit is expected to decline. In the Etowah River (F3) resilience unit, urbanization under the low, moderate, and high development scenarios is projected to increase and comprise 35, 38, and 42 percent of the watershed, respectively, as compared to 14 percent of the watershed currently. Within the Conasauga River (F1) resilience unit, urbanization is projected to increase and comprise 13, 15, and 17 percent of the watershed under the low, moderate, and high development scenarios, as compared to 8 percent of the watershed currently. This projected urbanization coupled with continued agricultural activities will continue to impair, and potentially further decrease, stream habitat and water quality in the Conasauga River (F1) resilience unit, which already has elevated nitrogen, phosphorus, turbidity, and concentrations of bioavailable estrogen (Freemen *et al.* 2017, pp. 429–430). In addition, the future scenarios project the Etowah River (F3) and Conasauga River (F1) units to have low resiliency (under the moderate development scenario) and to have low resiliency and be likely extirpated, respectively (under the high development scenario), by the year 2050. This would significantly increase the risk of extirpation of the Upper Coosa (F) representation unit from a catastrophic or stochastic event. Our examination leads us to find that there is substantial information that the Upper Coosa River (F) representation unit is likely to become in danger of extinction within the foreseeable future.

We then proceeded to consider whether this portion of the range (*i.e.,* the Upper Coosa River (F) representation unit) is significant. For the purposes of this analysis, the Service is considering significant portions of the range by applying any reasonable definition of ''significant.'' We asked whether any portions of the range may be biologically meaningful in terms of the resiliency, redundancy, or representation of the entity being evaluated. This approach is consistent with the Act, our implementing regulations, our policies, and case law.

We evaluated the available information about the portion of the species that occupies the Upper Coosa River representation unit, assessing its significance. Throughout most of its range, the frecklebelly madtom occurs in rivers within the Gulf Coastal Plain physiographic province, which is an area comprising the former continental shelf and is currently above sea level (Fennemann 1928, p. 280). The Upper Coosa River (F) representation unit occurs in the Ridge and Valley (Conasauga River (F1) and Coosawattee River (F2) resilience units) and Piedmont Upland (Etowah River (F3) resilience unit) physiographic provinces. Physiographic provinces are regions divided into distinctive geographic areas based on physical geography, such as topography, soil type, and geologic history (Fenneman 1928, pp. 266–272), where areas with similar characteristics are grouped into a province. The Piedmont province contains lowlands (plains) and highlands (plateaus) with isolated mountains, and in Georgia, the elevation reaches up to 480 meters (1,500 feet) (Fennemann 1928, p. 293); the Ridge and Valley province contain a longitudinal series of valleys (lowlands) and ridges (mountains) through the Appalachians (Fennemann 1928, p. 296). Given the Upper Coosa River (F) representation unit occurs in different physiographic provinces with a distinctive physical geography from the rest of the range, frecklebelly madtoms in this unit may experience environmental conditions, such as soils, water chemistry, hydrological regimes, and nutrient cycling, that are different from the rest of the range. These rivers in the Upper Coosa River (F) representation unit, flowing through unique physiographic provinces, are also removed from the nearest Coastal Plain physiographic province resilience units by approximately 418 river miles (673 river kilometers) and represent the most eastern and northern resilience units of the frecklebelly madtom.

Historically and currently, the Upper Coosa River (F) representation unit represents a small portion (less than 15 percent based on current occurrences and occupied stream reaches; less than 24 percent based on historical occurrences) of the frecklebelly madtom's range. If the Upper Coosa River (F) representation unit was extirpated, the frecklebelly madtom would lose some representation and redundancy, but the loss of this portion of the species' range would still leave sufficient resiliency (populations with moderate to high resiliency), redundancy, and representation in the remainder of the species' range such that it would not notably reduce the viability of the species. Therefore, despite the Upper Coosa River (F) representation unit occurring in different physiographic provinces and being disjunct from the remainder of the range, this unit only represents a small portion of the frecklebelly madtom's historical and current range and does not represent a significant portion of the frecklebelly madtom's range. We conclude that the frecklebelly madtom is not in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range. Our approach is consistent with the courts' holdings in *Desert Survivors* v. *Department of the Interior,* 321 F. Supp. 3d 1011 (N.D. Cal. 2018), and *Center for Biological Diversity* v. *Jewell,* 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the frecklebelly madtom. Because the species is neither in danger of extinction now nor likely to become so in the foreseeable future throughout all or any significant portion of its range, the frecklebelly madtom does not meet the definition of an

endangered species or threatened species. Therefore, we find that listing the frecklebelly madtom as an endangered or threatened species under the Act is not warranted at this time. This constitutes the conclusion of the Service's 12-month finding on the 2010 petition to list the frecklebelly madtom as an endangered or threatened species. A detailed discussion of the basis for this finding can be found in the SSA report and other supporting documents (available on the internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058).

We ask the public to submit to us any new information that becomes available concerning the taxonomy, biology, ecology, or status of the frecklebelly madtom, or stressors to the frecklebelly madtom, whenever it becomes available. Please submit any new information, materials, comments, or questions concerning this finding to the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Distinct Population Segment (DPS) Analysis

Under the Act, we have the authority to consider for listing any species, subspecies, or, for vertebrates, any distinct population segment (DPS) of these taxa if there is sufficient information to indicate that such action may be warranted. To guide the implementation of the DPS provisions of the Act, we and the National Marine Fisheries Service (National Oceanic and Atmospheric Administration—Fisheries), published the Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act (DPS Policy) in the **Federal Register** on February 7, 1996 (61 FR 4722). Under our DPS Policy, we use two elements to assess whether a population segment under consideration for listing may be recognized as a DPS: (1) The population segment's discreteness from the remainder of the species to which it belongs, and (2) the significance of the population segment to the species to which it belongs. If we determine that a population segment being considered for listing is a DPS, then the population segment's conservation status is evaluated based on the five listing factors established by the Act to determine if listing it as either endangered or threatened is warranted.

The Upper Coosa River (F) representation unit consists of the Conasauga River, Coosawattee River, Etowah River, and their tributaries and watersheds (see figure 1, below). The Coosawattee River joins the Conasauga River to form the Oostanaula River, and the Etowah River joins the Oostanaula River to form the Coosa River. Within this proposed rule, we refer to the Upper Coosa River (F) representation unit as including all rivers and streams in the upper Coosa River basin that join to form the Coosa River; in other words, the entire watershed upstream from the confluence of the Oostanaula and Etowah Rivers. Below, we evaluated the Upper Coosa River representation unit of the frecklebelly madtom's range to determine whether it meets the definition of a DPS under our DPS Policy.

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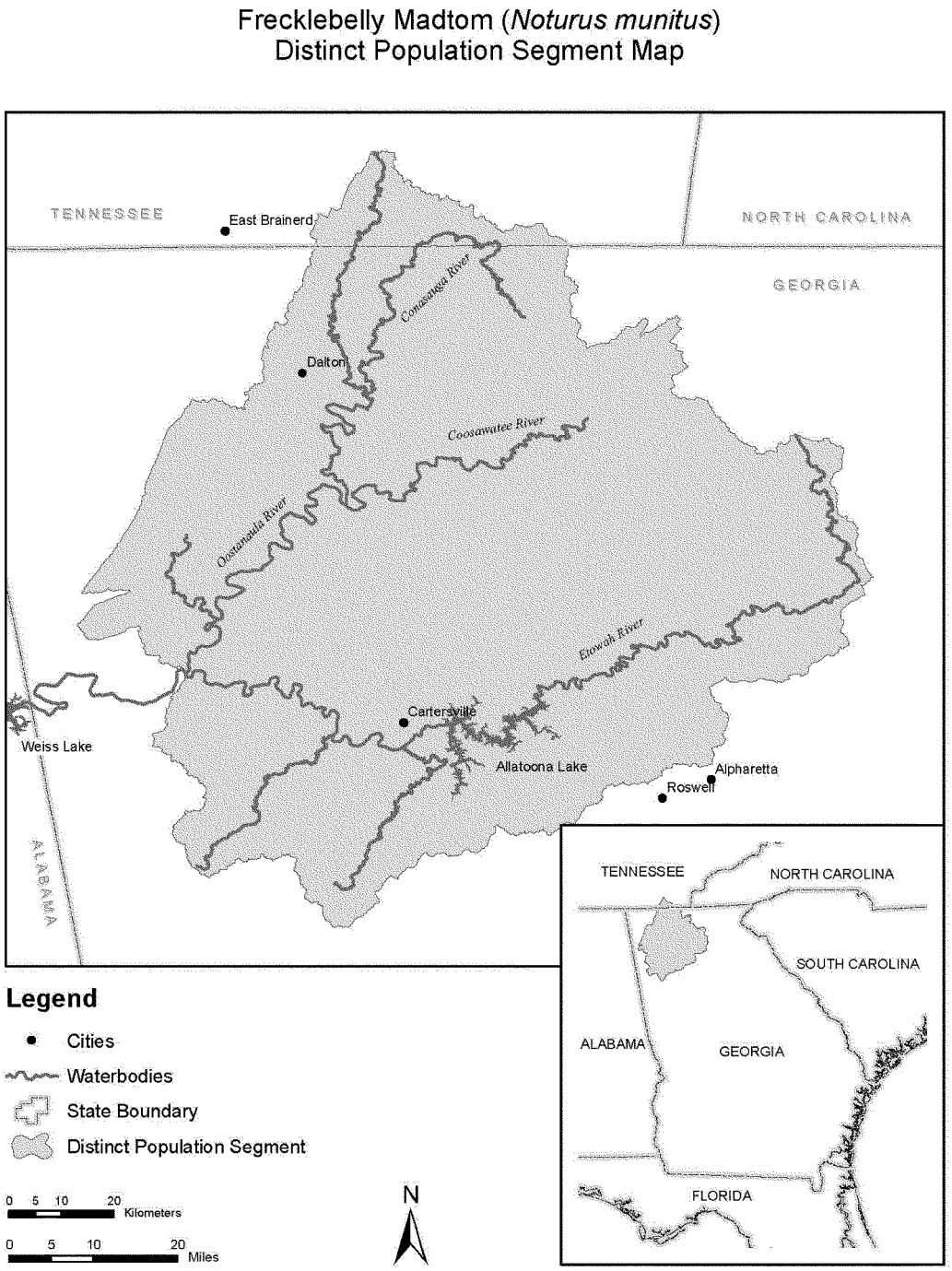

Figure 1. Rivers and streams within the Upper Coosa River DPS of the frecklebelly madtom.

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Discreteness

Under our DPS Policy, a population segment of a vertebrate taxon may be considered discrete if it satisfies either one of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

The Upper Coosa River (F) representation unit of the frecklebelly madtom is markedly separate from other representation and resilience units of the species both genetically and geographically. In terms of morphology and genetics, the frecklebelly madtom has exhibited some morphological and genetic differences across representation units. Preliminary data suggested there was considerable morphological variation across the species' range, and the populations in the Coosa River drainage were the most distinctive population (Neely 2018, p. 1). Given this information, it was thought that frecklebelly madtoms in the Conasauga and Etowah Rivers may be distinct from frecklebelly madtoms found elsewhere. Through a reanalysis of existing morphological and genetic data, frecklebelly madtoms collected from the Coosa River drainage were found to have shorter snout to barbel midpoint distance measurements than madtoms collected from other drainages, but this difference was not diagnostic of this population as there is overlap in the range of measurements among populations (Neely 2018, p. 7). In terms of genetic variation, considerable genetic differentiation was observed among the Pearl, Tombigbee, Cahaba, and Coosa Rivers populations; however, morphological variation was incongruent with genetic variation (Neely 2018, p. 10). These results ''do not allow clear diagnosis of distinct species within *Noturus munitus*'' (Neely 2018, p. 10). Because the data do not support the description of a distinct subspecies or species, each population of frecklebelly madtom is recommended to be considered as a separate evolutionary significant unit or ESU of the frecklebelly madtom (Neely 2018, p. 10). Therefore, the Upper Coosa River (F) representation unit is considered an ESU of the frecklebelly madtom, which provides key representation for the frecklebelly madtom as a whole.

The Upper Coosa River (F) representation unit also consists of separate and distinct physiographic provinces as compared to the majority of the species' range, as discussed above under *Status Throughout a Significant Portion of Its Range.* In terms of physical or geographic separation, the resilience units in the Upper Coosa River (F) representation unit are disjunct from other units of the frecklebelly madtom across the species' range. The distance of the geographic separation from other frecklebelly madtom representation and resilience units is approximately 418 river miles (673 river kilometers) upstream with seven dams (Weiss, H. Neely Henry, Logan Martin, Lay, Mitchell, Jordan, and R.F. Henry) and impoundments disrupting the connectivity and creating barriers to movement to the rest of the range. Therefore, frecklebelly madtoms in the Upper Coosa River (F) representation unit currently do not, and will likely never, naturally interact with individuals or populations in the remaining part of the range. In addition, if this portion becomes extirpated, frecklebelly madtoms located within the Coastal Plain physiographic province may be unable to recolonize the Upper Coosa River (F) representation unit, not only due to the lack of connectivity, but also because they may lack the needed adaptive traits to survive in these different physical geographies. Based on our review of the available information, we conclude that the Upper Coosa River representation unit of the frecklebelly madtom is markedly separate from other representation and resilience units of the species due to genetic separation and geographic (physical) isolation from frecklebelly madtoms in the remainder of the range. Therefore, we have determined that the Upper Coosa River representation unit of the frecklebelly madtom meets the condition for discreteness under our DPS Policy.

Significance

Under our DPS Policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. This consideration may include, but is not limited to: (1) Evidence of the persistence of the discrete population segment in an ecological setting that is unusual or unique for the taxon, (2) evidence that loss of the population segment would result in a significant gap in the range of the taxon, (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range, or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. Of particular note, as we explained in our draft (76 FR 76987, December 9, 2011, p. 76998) and final (79 FR 37577, July 1, 2014, pp. 79 FR 37579, 37585) Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (SPR Policy), the definition of ''significant'' for the purpose of significant portion of the range analysis differs from the definition of ''significant'' found in our DPS Policy and used for DPS analysis. Although there are similarities in the definition of ''significant'' under the SPR Policy and the definition of ''significance'' in the DPS Policy, there are important differences between the two. The DPS Policy requires that for a vertebrate population to meet the Act's definition of ''species,'' it must be discrete from other populations and must be significant to the taxon as a whole. The significance criterion under the DPS Policy is necessarily broad and could be met under a wider variety of circumstances even if it could not be met under the SPR Policy. In this case, we determine (see below) that the Upper Coosa River (F) representation unit is ''significant'' for the purposes of DPS, and we did not, as discussed above, conclude that it constituted a ''significant'' portion of the frecklebelly madtom's range.

Currently, the Upper Coosa River (F) representation unit is one of four known extant units within the species. We determined that loss of this unit (population segment) would result in a significant gap in the species' range. The Upper Coosa River (F) representation unit in Georgia and Tennessee represents the eastern and northernmost portion of the frecklebelly madtom's range, with the remainder of the range occurring in Louisiana, Mississippi, and Alabama. As discussed previously, this unit also occurs in different physiographic provinces (Ridge and Valley province and Piedmont Upland province) associated with different environmental and physical conditions. Lastly, the Upper Coosa River (F) representation unit is approximately 418 river miles (673 kilometers) from the nearest resilience units in the Coastal Plain province. Therefore, the loss of this unit would result in the species' range shifting south and west approximately 418 miles (673 kilometers).

As with other representation units, the Upper Coosa River (F) representation unit of the frecklebelly madtom differs markedly from other populations of the species in its genetic characteristics. As discussed above, considerable genetic differentiation has been observed among populations of frecklebelly madtom (Neely 2018, p. 10), and these populations are considered evolutionary significant units of frecklebelly madtom. In addition, the Upper Coosa River (F) representation unit of the frecklebelly madtom persists in different physiographic provinces than the remainder of the range. The Upper Coosa River (F) representation unit occurs in the Ridge and Valley

(Conasauga River (F1) and Coosawattee River (F2) resilience units) and Piedmont Upland (Etowah River (F3) resilience unit) physiographic provinces, while the rest of the range occurs in rivers within the Gulf Coastal Plain physiographic province. Having persisted over time in areas with distinctive physical geography, frecklebelly madtoms in the Upper Coosa River (F) representation unit have likely adapted to environmental conditions, such as soils, water chemistry, hydrological regimes, and nutrient cycling, differently, as demonstrated by the divergent genetics described by Neely (2018, entire), and have likely contributed to the adaptive capacity of the species. The adaptations of frecklebelly madtoms are an important and unique component of the species' representation, which is evidence of it differing markedly from other populations of the species in its genetics. Therefore, we have substantial evidence that the Upper Coosa River (F) representation unit of the frecklebelly madtom differs markedly in its genetic characteristics, as it is considered an evolutionary significant unit, and loss of this genetic diversity would likely impact the species' adaptive capacity. However, although the loss of the Upper Coosa River (F) representation unit would likely result in a reduction in species' redundancy, and, therefore, the species' adaptive capacity, it would not notably reduce the viability of the species across the range (see above under *Status Throughout a Significant Portion of Its Range*).

Given the evidence that the Upper Coosa River (F) representation unit of the frecklebelly madtom would result in a significant gap in the range if lost, and that the unit differs markedly from other populations of the species, we consider this unit to be significant to the species as a whole. Thus, the Upper Coosa River (F) representation unit of the frecklebelly madtom meets the criteria for significance under our DPS Policy.

DPS Conclusion for the Upper Coosa River Representation Unit of the Frecklebelly Madtom

Our DPS Policy directs us to evaluate the significance of a discrete population in the context of its biological and ecological significance to the remainder of the species to which it belongs. Based on an analysis of the best available scientific and commercial data, we conclude that the Upper Coosa River (F) representation unit of the frecklebelly madtom is discrete due to genetic separation and geographic (physical) isolation from the remainder of the taxon. Furthermore, we conclude that the Upper Coosa River representation unit of the frecklebelly madtom is significant, as described above. Therefore, we conclude that the Upper Coosa River (F) representation unit of the frecklebelly madtom is both discrete and significant under our DPS Policy and is, therefore, a listable entity under the Act.

Based on our DPS Policy (61 FR 4722; February 7, 1996), if a population segment of a vertebrate species is both discrete and significant relative to the taxon as a whole (*i.e.,* it is a distinct population segment), its evaluation for endangered or threatened status will be based on the Act's definition of those terms and a review of the factors enumerated in section 4(a) of the Act. Having found that the Upper Coosa River (F) representation unit of the frecklebelly madtom meets the definition of a distinct population segment, we now evaluate the status of this DPS to determine whether it meets the definition of an endangered or threatened species under the Act.

Status Throughout All of the DPS's Range

In the analysis above for the frecklebelly madtom as a whole, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Upper Coosa River DPS of the species. We considered whether the Upper Coosa River DPS of the frecklebelly madtom is presently in danger of extinction throughout all of its range. The Upper Coosa River representation unit faces ongoing and future threats from habitat destruction and degradation caused by agriculture and developed land uses resulting in poor water quality. As discussed above under *Status Throughout a Significant Portion of Its Range,* occurrence records in the Etowah River (F3) resilience unit are considered similar to historical occurrence records, whereas there have been declines from historical conditions in frecklebelly madtom occurrences in the Conasauga River (F1) resilience unit. Evidence of the frecklebelly madtom presence was first reported from the Coosawattee River (F2) from eDNA collected in 2018. Until eDNA for the species was recorded from this river, the frecklebelly madtom was not expected occur there, given that the history of physical modification to improve navigation, as well as hydropeaking at Carters Dam, upstream has negatively affected small-bodied, riffle-dwelling fish species (Freeman *et al.* 2011, pp. 10–11). However, given the current resiliency of units within the Upper Coosa River (F) representation unit, it is not likely that the current threats, or the cumulative effects of those threats, will result in the extirpation of the DPS. Therefore, the DPS is not currently in danger of extinction throughout its range.

In the future, projected urbanization and continued agricultural activities will continue to impact the Upper Coosa River DPS and its habitat by negatively affecting water quality (Factor A). Our future scenarios project the Etowah River (F3) and Conasauga River (F1) units in the Upper Coosa River (F) representation unit to have low resiliency or to become extirpated by the year 2050, and this would significantly increase the risk of extirpation of the Upper Coosa River (F) representation unit from the aforementioned threats, as well as a catastrophic or stochastic event, within the foreseeable future. In our consideration of foreseeable future, we evaluated how far into the future we could reliably predict the threats to this unit, as well as the madtom's response to those threats. Based on the modeling and scenarios (agriculture and developed land use projections to 2050) evaluated, we considered our ability to make reliable predictions in the future and the uncertainty in how and to what degree the unit could respond to those risk factors in this timeframe. We determined a foreseeable future of 30 years for the Upper Coosa River representation unit. Based on this information, we find the Upper Coosa River DPS of the frecklebelly madtom is likely to become endangered within the foreseeable future throughout all of its range. Therefore, we consider the Upper Coosa River DPS to be threatened throughout all of its range.

Status Throughout a Significant Portion of the DPS's 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 in the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity* v. *Everson,* 2020 WL 437289 (D.D.C. Jan. 28, 2020) (*Center for Biological Diversity*), vacated the aspect of the SPR Policy (79 FR 37577; July 1, 2014) that provided that the Service does not undertake an analysis of significant portions of a species' range if the species warrants listing as threatened throughout all of its range. Therefore, we proceed to evaluating whether the species (DPS) 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 *Center for Biological Diversity,* 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 the Upper Coosa River DPS of the frecklebelly madtom, we chose 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 any portions of the range where the species is endangered. We considered whether the threats acting on the Upper Coosa River DPS are geographically concentrated in any portion of the range at a biologically meaningful scale. We examine the following threats that were considered to be primary factors driving current resiliency of the Upper Coosa River DPS: Habitat destruction and degradation caused by agriculture and developed land uses resulting in poor water quality (Factor A).

Habitat destruction and degradation from agriculture and developed land uses resulting in poor water quality is occurring throughout the range of the Upper Coosa River DPS. In the Conasauga River (F1) resilience unit, current development and agriculture comprises 8.0 percent and 21.3 percent of the watershed, respectively (Service 2020, pp. 66–69). In the Coosawattee River (F2) resilience unit, current development and agriculture comprises 6.6 percent and 27.2 percent of the watershed, respectively (Service 2020, pp. 66–69). Lastly, current development and agriculture comprises 14.8 percent and 10.4 percent of the Etowah River (F3) resilience unit (Service 2020, pp. 66–69). For the three resilience units assessed within the DPS, approximately 25 to 33 percent of each unit is currently impacted by agricultural and developed land uses. Therefore, we found no concentration of threats in any portion of the Upper Coosa River DPS's range at a biologically meaningful scale. However, we identified one portion, the Conasauga River (F1) resilience unit, which currently has low resiliency and where the frecklebelly madtom has not been observed, despite repeated surveys, in at least 20 years. Environmental DNA surveys have detected the frecklebelly madtom in the Conasauga River (F1) resilience unit, leading us to determine the species remains present there. However, the lack of recent occurrence data coupled with projections that this unit will become extirpated within the foreseeable future led us to find there is substantial information that the Conasauga River (F1) resilience unit may be endangered.

We then proceeded to consider whether this portion of the range (*i.e.,* the Conasauga River (F1) resilience unit) is significant. For purposes of this analysis, the Service is examining for significant portions of the range by applying any reasonable definition of ''significant.'' We asked whether any portions of the range may be biologically meaningful in terms of the resiliency, redundancy, or representation of the entity being evaluated. This approach is consistent with the Act, our implementing regulations, our policies, and case law.

The Upper Coosa River (F) representation unit occurs in the Ridge and Valley (Conasauga River (F1) resilience unit) and Piedmont Upland (Etowah River (F3) resilience unit) physiographic provinces. As discussed above under *Status Throughout a Significant Portion of Its Range* for the frecklebelly madtom as a whole, physiographic provinces are geographic areas divided based on physical geography and grouped by similar characteristics (Fenneman 1928, pp. 266–272). The Conasauga River (F1) resilience unit occurs in the Ridge and Valley province, which contains a series of valleys (lowlands) and ridges (mountains) through the Appalachians (Fennemann 1928, p. 296). The Etowah River (F3) resilience unit occurs in the Piedmont province, which contains lowlands (plains) and highlands (plateaus) with isolated mountains (Fennemann 1928, p. 293). These two resilience units may occur in two physiographic provinces; however, the geography in both represents environmental and physical conditions of lowlands and highlands associated with higher elevations than the remainder of the species' range in the Coastal Plain province. Frecklebelly madtoms collected in both the Conasauga River (F1) and Etowah River (F3) resilience units are strongly associated with river weed (*Podostemum* spp.) used for cover and shelter. Neither unit acts as a refugia or an important spawning ground for the DPS. In addition, the Conasauga River (1) resilience unit watershed is experiencing similar impacts from development and agricultural land-use to the Etowah River (F3) resilience unit. Since the Upper Coosa River DPS of the frecklebelly madtom occurs in rivers with similar physical and environmental conditions, and the Conasauga River (F1) resilience unit portion is experiencing similar water quality impacts as the remainder of the DPS's range, there is no unique observable environmental usage or behavioral characteristics attributable to just this portion that would make it a significant portion of the range of the Upper Coosa River DPS.

Overall, there is little evidence to suggest that the Conasauga River (F1) portion of the range has higher quality or higher value habitat or any other special importance to the species' life history in the Upper Coosa River DPS. We considered if the Conasauga River (F1) portion contributes to biological significance in any way listed above and did not find this portion to be prominent or noteworthy in a manner that would suggest it is a significant portion of the DPS's range. Thus, based on the best available information, we find that this portion of the DPS's range is not biologically significant. Therefore, no portion of the Upper Coosa River DPS's range provides a basis for determining that it is in danger of extinction in a significant portion of its range. This is consistent with the courts' holdings in *Desert Survivors* v. *Department of the Interior,* No. 16–cv–01165–JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), and *Center for Biological Diversity* v. *Jewell,* 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

Determination of Status

We evaluated threats to the frecklebelly madtom and assessed the cumulative effect of the threats under the Act's section 4(a)(1) factors and conclude the species, viewed across its entire range, experiences a low risk of extinction. Based on the best available scientific and commercial information as presented in the SSA report and this finding, we do not find that the frecklebelly madtom is currently in danger of extinction throughout all or a significant portion of its range, nor is it likely to become so in the foreseeable future. However, we did find the Upper Coosa River representation unit is a valid DPS, and this DPS of the frecklebelly madtom is likely to become endangered within the foreseeable future throughout all of its range. Therefore, we propose to list the Upper Coosa River DPS of the frecklebelly madtom as a threatened species throughout all of its range 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, 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 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 recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. 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.

Recovery planning consists of preparing draft and final recovery plans, beginning with the development of a recovery outline and making it available to the public within 30 days of a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan also 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. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (*http://www.fws.gov/endangered*), 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 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 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 States of Georgia and Tennessee would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Upper Coosa River DPS of the frecklebelly madtom. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although the Upper Coosa River DPS of the frecklebelly madtom 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(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered, or on private lands seeking funding by Federal agencies, which may include, but are not limited to, the USDA U.S. Forest Service, USDA Farm Service Agency, USDA Natural Resources Conservation Service, and Federal Emergency Disaster Service; issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. 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. The discussion below regarding protective regulations under section 4(d) of the Act complies with our policy.

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 he deems necessary and advisable to provide for the conservation of species listed as threatened. The U.S. Supreme Court has noted that statutory language like ''necessary and advisable'' demonstrates a large degree of deference to the agency (see *Webster* v. *Doe,* 486 U.S. 592 (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 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 rules developed under section 4(d) as a valid exercise of agency authority where they prohibited take of threatened wildlife or include a limited taking prohibition (see *Alsea Valley Alliance* v. *Lautenbacher,* 2007 U.S. Dist. Lexis 60203 (D. Or. 2007); *Washington Environmental Council* v. *National Marine Fisheries Service,* 2002 U.S. Dist. Lexis 5432 (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 him with regard to the permitted activities for those species. He may, for example, permit taking, but not importation of such species, or he 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).

Exercising our authority under section 4(d), we have developed a proposed rule that is designed to address the specific threats and conservation needs for the Upper Coosa River DPS of the frecklebelly madtom. Although the statute does not require us to make a ''necessary and advisable'' finding with respect to the adoption of specific prohibitions under section 9, we find that this rule as a whole satisfies the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the Upper Coosa River DPS of frecklebelly madtom. As discussed above under Summary of Biological Status and Threats, we have concluded that the Upper Coosa River DPS is likely to become in danger of extinction within the foreseeable future primarily due to habitat destruction and degradation from agriculture and developed land uses resulting in poor water quality. The provisions of this proposed 4(d) rule would promote conservation of the Upper Coosa River DPS by encouraging management of the landscape in ways that meet both watershed and riparian management purposes and the conservation needs of the Upper Coosa River DPS. The provisions of this proposed rule are one of many tools that we would use to promote the conservation of the Upper Coosa River DPS. This proposed 4(d) rule would apply only if and when we make final the listing of the Upper Coosa River DPS as a threatened species.

Provisions of the Proposed 4(d) Rule

This proposed 4(d) rule would provide for the conservation of the Upper Coosa River DPS by prohibiting the following activities, except as otherwise authorized or permitted: Import or export (see proposed § 17.44(ee)(1)(i)); take (see proposed § 17.44(ee)(1)(ii)); possession and other acts with unlawfully taken specimens (see proposed § 17.44(ee)(1)(iii)); delivery, receipt, transport, or shipment in interstate or foreign commerce in the course of commercial activity (see proposed § 17.44(ee)(1)(iv)); and sale or offer for sale in interstate or foreign commerce (see proposed § 17.44(ee)(1)(v)). We also include several exceptions to these prohibitions, which along with the prohibitions are set forth under Proposed Regulation Promulgation, 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 regulation at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally, unintentionally, or incidentally. Protecting the Upper Coosa River DPS of the frecklebelly madtom from direct forms of take, such as physical injury or killing, whether incidental or intentional, will help preserve and recover the remaining populations of the DPS. Therefore, we prohibit intentional take of frecklebelly madtom, including, but not limited to, capturing, handling, trapping, collecting, or other activities (see proposed § 17.44(ee)(1)(ii)). Also, as discussed above under Summary of Biological Status and Threats, habitat destruction and degradation from agriculture and developed land uses are affecting the status of the Upper Coosa River DPS. Across the DPS's range, stream and water quality have been degraded physically by sedimentation, pollution, contaminants, impoundments, channelization, destruction of riparian habitat, and loss of riparian vegetation due to agriculture activities and development within the watershed and riparian areas. Other habitat or hydrological alteration, such as ditching, draining, stream diversion, or diversion or alteration of surface or ground water flow, into or out of the stream will impact the habitat of the DPS. Therefore, we prohibit actions that result in the incidental take of the Upper Coosa River DPS by destroying, altering, or degrading the habitat in the manner described above (see proposed § 17.44(ee)(1)(ii)). Regulating these activities would help preserve the DPS's remaining populations, slow the rate of population decline, and decrease synergistic, negative effects from other stressors.

Exceptions to Prohibitions

In addition to certain statutory exceptions from prohibitions, which are found in sections 9 and 10 of the Act, the proposed 4(d) rule includes the following exceptions to the prohibitions:

Permitted Activities

We may issue permits to carry out otherwise prohibited activities, including those described above, involving threatened wildlife under certain circumstances (see proposed § 17.44(ee)(2)(i)). Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be 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 Act. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

Activities Not Requiring a Permit

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 the Service in implementing all aspects of the Act. In

this regard, section 6 of the Act provides that the Service shall 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 the Service 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 the Upper Coosa River DPS that may result in otherwise prohibited take without additional authorization (see proposed § 17.44(ee)(2)(iii)).

We may allow take of the individuals of the Upper Coosa River DPS without a permit by any employee or agent of the Service or a State conservation agency designated by his agency for such purposes and when acting in the course of his official duties if such action is necessary to aid a sick, injured or orphaned specimen; dispose of a dead specimen; or salvage a dead specimen which may be useful for scientific study (see proposed § 17.44(ee)(2)(ii)). In addition, Federal and State law enforcement officers may possess, deliver, carry, transport, or ship specimens taken in violation of the Act as necessary (see proposed § 17.44(ee)(2)(v)).

Channel Restoration, Streambank Stabilization, and Other Activities

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* spp.). This provision of the proposed 4(d) rule for channel restoration would promote conservation of the Upper Coosa River DPS by excepting incidental take resulting from activities that would improve channel conditions and restore degraded, physically unstable streams or stream segments (see proposed § 17.44(ee)(2)(iv)(A)). We anticipate these activities will advance ecological conditions within a watershed to a more natural state that will benefit the frecklebelly madtom.

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: Live stakes (live, vegetative cuttings inserted or tamped into the ground in a manner that allows the stake to take root and grow), live fascines (live branch cuttings, usually willows, bound together into long, cigar-shaped bundles), planting of bare-root seedlings or 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 (rip-rap) or the use of rock baskets or gabion structures, but could be used in conjunction with the above bioengineering methods. This provision of the proposed 4(d) rule for streambank stabilization would promote conservation of the Upper Coosa River DPS by excepting from the prohibition incidental take resulting from activities that would improve habitat conditions by reducing bank erosion and instream sedimentation (see proposed § 17.44(ee)(2)(iv)(B)).

Improving watershed, riparian, and habitat conditions within the range of the Upper Coosa River DPS would provide for the conservation of the DPS and would likely increase resiliency in the Etowah River and Conasauga River resilience units. Activities carried out under the Working Lands for Wildlife (WLFW) program of the Natural Resources Conservation Service (NRCS), 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, would benefit the DPS if they do not alter habitats known to be used by the DPS 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 for other activities would promote conservation of the Upper Coosa River DPS by excepting from the prohibition incidental take resulting from activities as described above (see proposed § 17.44(ee)(2)(iv)(C)).

Relation of 4(d) Rule to Available Conservation Measures

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 partnerships for the management and protection of the Upper Coosa River DPS. 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).

Since we are proposing a threatened status for the Upper Coosa River DPS of the frecklebelly madtom and this proposed rule outlines the protections in section 9(a)(1) of the Act for the DPS, we are identifying those activities that would or would not constitute a violation of either section 9(a)(1) or this proposed 4(d) rule. Based on the best available information, at this time, activities identified as discussed above under *Exceptions to Prohibitions* would not be considered to result in a violation of section 9 of the Act. On the other hand, based on the best available information, the following actions may potentially result in a violation of section 9 of the Act if we adopt this proposed rule; this list is not comprehensive:

(1) Unauthorized handling, collecting, possessing, selling, delivering, carrying, or transporting of the frecklebelly madtom, including interstate transportation across State lines and import or export across international boundaries.

(2) Destruction/alteration of the species' habitat by discharge of fill material, draining, ditching, tiling, pond construction, stream channelization or diversion, or diversion or alteration of surface or ground water flow into or out of the stream (*i.e.,* due to roads, impoundments, discharge pipes, stormwater detention basins, etc.).

(3) Introduction of nonnative species that compete with or prey upon the frecklebelly madtom.

(4) Discharge of chemicals or fill material into any waters in which the frecklebelly madtom is known to occur.

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

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.

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 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 Federal agencies 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 critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Designation also does not allow the government or public to access private lands, nor does designation require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the Federal agency would be required to consult with the Service under section 7(a)(2) of the Act. However, even if the Service were to conclude that the proposed activity would 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 and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical or biological features that occur in specific occupied areas, we focus on the specific features that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity.

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. When designating critical habitat, the Secretary will first evaluate areas occupied by the species. The Secretary will only consider unoccupied areas to be essential where a critical habitat designation limited to geographical areas occupied by the species would be inadequate to ensure the conservation of the species. In addition, for an unoccupied area to be considered essential, the Secretary must determine that there is a reasonable certainty both that the area will contribute to the conservation of the species and that the area contains one or more of those physical or biological features essential to the conservation of the species.

Section 4 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 from 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) section 9 of the Act's prohibitions on taking any individual of the species, including taking caused by actions that affect habitat. 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 this species. Similarly, critical habitat designations made on the basis of the best available information 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 these planning efforts calls for a different outcome.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary shall designate critical habitat at the time the species is determined to be an endangered or threatened species. Our regulations (50 CFR 424.12(a)(1)) state that the Secretary may, but is not required to, determine that a designation would not be prudent in the following circumstances:

(i) The species is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat to the species;

(ii) The present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or threats to the species' habitat stem solely from causes that cannot be addressed through management actions resulting from consultations under section 7(a)(2) of the Act;

(iii) Areas within the jurisdiction of the United States provide no more than negligible conservation value, if any, for a species occurring primarily outside the jurisdiction of the United States;

(iv) No areas meet the definition of critical habitat; or

(v) The Secretary otherwise determines that designation of critical habitat would not be prudent based on the best scientific data available.

As discussed earlier in this document, there is currently no imminent threat of take attributed to collection or vandalism identified under Factor B for this species, and identification and mapping of critical habitat is not expected to initiate any such threat. In our SSA and proposed listing determination for the Upper Coosa River DPS of the frecklebelly madtom, we determined that the present or threatened destruction, modification, or curtailment of habitat or range is a threat to the Upper Coosa River DPS and that those threats in some way can be addressed by section 7(a)(2) consultation measures. The species occurs wholly in the jurisdiction of the United States, and we are able to identify areas that meet the definition of critical habitat. Therefore, because none of the circumstances enumerated in our regulations at 50 CFR 424.12(a)(1) have been met and because there are no other circumstances the Secretary has identified for which this designation of critical habitat would be not prudent, we have determined that the designation of critical habitat is prudent for the Upper Coosa River DPS.

Critical Habitat Determinability

Having determined that designation is prudent, under section 4(a)(3) of the Act we must find whether critical habitat for the Upper Coosa River DPS of the frecklebelly madtom is determinable. 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.'' When critical habitat is not determinable, the Act allows the Service an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

We reviewed the available information pertaining to the biological needs of the Upper Coosa River DPS and habitat characteristics where this DPS is located. This and other information represent the best scientific data available and led us to conclude that the designation of critical habitat is determinable for the Upper Coosa River DPS.

Physical or Biological Features Essential to the Conservation of the Species

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas we will designate as critical habitat from within the geographical area occupied by the species at the time of listing, we consider the physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection. The regulations at 50 CFR 424.02 define ''physical or biological features essential to the conservation of the species'' as the features that occur in specific areas and that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features essential to the conservation of the species might include gravel of a particular size required for spawning, alkali soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or a particular level of nonnative species consistent with conservation needs of the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

In considering whether features are essential to the conservation of the species, we may consider an appropriate quality, quantity, and spatial and temporal arrangement of habitat characteristics in the context of the life-history needs, condition, and status of the species. These characteristics include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing (or development) of offspring;

and habitats that are protected from disturbance.

The Upper Coosa River DPS is a population segment of the frecklebelly madtom and occurs in the upper Coosa River system in the Piedmont Upland physiographic province in Georgia and the Ridge and Valley physiographic province in Georgia and Tennessee. The primary habitat features that influence the resiliency of the Upper Coosa River DPS include flowing water, suitable water quality, substrate, cover, and habitat connectivity. These features are essential to the survival and reproduction of individuals at all life stages.

As stated above, the frecklebelly madtom occurs in small to large, swift-flowing rivers consisting of stable riffle-run pool complexes and with a substrate that consists of silt-free gravel, coarse sand, cobble, and boulders. The species needs unimpounded flowing water to successfully reproduce and maintain populations. In addition, streams must have an adequate flow to maintain instream habitats and connectivity of streams with the floodplain, which is important to allow nutrient and sediment exchange for habitat maintenance. Stream reaches with suitable habitat must be large enough and have connectivity to support enough frecklebelly madtoms to ensure individuals can find a mate and reproduce (Service 2020, p. 17). Cover is an important component of suitable habitat for the frecklebelly madtom and provides shelter from predators, space to forage, and space to nest. The species is often found in or near aquatic vegetation, such as river weed (*Podostemum* spp.), woody structures, and under large, flat rocks. In addition, nesting sites for madtoms are typically cavities under natural material (rocks, logs, empty mussel shells). Thus, small to large flowing rivers with appropriate substrate, cover, and connectivity are important for the growth, reproduction, and survival of the frecklebelly madtom.

The frecklebelly madtom, like other benthic species, is sensitive to poor water quality (Warren *et al.* 1997, p. 125) and needs clean, flowing water to survive. Changes in water chemistry and flow patterns, resulting in a decrease in water quality and quantity, have detrimental effects on madtom ecology, because they can render aquatic habitat unsuitable for occupancy. In addition, the frecklebelly madtom is intolerant of excessive sedimentation (Shepard 2004, p. 221). The minimum and maximum standards of water quality and quantity conditions that are conducive to the presence of frecklebelly madtom is not well known. However, muddy waterways, lentic streams (still water), and poor water quality conditions are not desirable for maintaining suitable habitat for the species. Therefore, appropriate water and sediment quality are necessary to sustain growth, reproduction, and viability of the frecklebelly madtom and are essential to the conservation of the species.

The species is an opportunistic insectivore feeding on a variety of aquatic insects and larvae, including caddisflies, mayflies, blackflies, and midges (Miller 1984, p. 9). Seasonal changes found in diet probably reflect differences in prey availability (Miller 1984, p. 11). Therefore, a diverse and available aquatic macroinvertebrate assemblage is important to the growth and survival of the frecklebelly madtom.

More detail of the habitat and life history needs are summarized above under Background, and a thorough review is available in the SSA report (Service 2020, entire; available on *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058). A summary of the resource needs of the Upper Coosa River DPS is provided below in table 3.

TABLE 3—RESOURCE NEEDS FOR THE UPPER COOSA RIVER DPS OF THE FRECKLEBELLY MADTOM TO COMPLETE EACH LIFE STAGE

Life stage	Resources needed
Fertilized eggs	Flowing water with good water quality; cavities for shelter; parental care.
Larvae	Flowing water with good water quality; low predation, disease, and environmental stress; adequate food availability.
Juveniles	Flowing water with good water quality; low predation, disease, and environmental stress; structure (vegetation, rock, substrate) for shelter and forage; adequate food availability.
Adults	Flowing water with adequate water quality; structure (vegetation, rock, substrate) for shelter, forage, and nesting; cavities for nesting; appropriate male to female demographics; adequate food availability.

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of Upper Coosa River DPS of the frecklebelly madtom from studies of the species' habitat, ecology, and life history as described above. Additional information can be found in the SSA report (Service 2020, entire; available on *http://www.regulations.gov* under Docket No. FWS–R4–ES–2020–0058). We have determined that the following physical or biological features are essential to the conservation of Upper Coosa River DPS of the frecklebelly madtom:

(1) Geomorphically stable, medium to large streams with:

(a) Stable stream channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation; and

(b) Banks with intact riparian cover to maintain stream morphology and reduce erosion and sediment inputs.

(2) Connected instream habitats that:

(a) Include stable riffle-run pool complexes;

(b) Consist of silt-free gravel, coarse sand, cobble, boulders, woody structure, and river weed (*Podostemum* spp.); and

(c) Have abundant cobble, boulders, woody structure, or other suitable cover used for nesting.

(3) Adequate flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain instream habitats and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the fish's habitat, food availability, and ample oxygenated flow for spawning and nesting habitat.

(4) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; ammonia; heavy metals; pesticides; animal waste products; and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(5) Diversity and availability of aquatic macroinvertebrate prey items, which include larval midges, mayflies, caddisflies, dragonflies, and beetles.

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the Upper Coosa River DPS may require special management considerations or protections to reduce the following threats: (1) Urbanization of the landscape, including (but not limited to) land conversion for urban and commercial use, infrastructure (roads, bridges, utilities), and urban water uses (water supply reservoirs, wastewater treatment); (2) nutrient pollution from agricultural activities that impact water quantity and quality; (3) significant alteration of water quality; (4) culvert and pipe installation that creates barriers to movement; (5) other watershed and floodplain disturbances that release sediments or nutrients into the water or fill suitable spawning habitat; and (6) creation of reservoirs that convert permanently flowing streams and/or streams that hold water into lake or pond-like (lentic) environments.

Management activities that could ameliorate these threats include, but are not limited to, use of best management practices (BMPs) designed to reduce sedimentation, erosion, and bank-side destruction; protection of riparian corridors and suitable spawning habitat; retention of sufficient canopy cover along banks; moderation of surface and ground water withdrawals to maintain natural flow regimes; increased use of stormwater management and reduction of stormwater flows into the stream systems; placement of culverts or bridges that accommodate fish passage; and reduction of other watershed and floodplain disturbances that release sediments, pollutants, or nutrients into the water.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat. To determine and select appropriate occupied areas that contain the physical or biological features essential to the conservation of the species or areas otherwise essential for the conservation of the Upper Coosa River DPS of the frecklebelly madtom, we developed a conservation strategy for the DPS. The goal of the conservation strategy for the Upper Coosa River DPS of the frecklebelly madtom is to recover the DPS to the point where the protections of the Act are no longer necessary. The role of critical habitat in achieving this conservation goal is to identify the specific areas within the Upper Coosa River DPS's range that provide essential physical or biological features, without which range-wide resiliency, redundancy, and representation could not be achieved. We anticipate that recovery will require continued protection of existing resilience units and habitats that contribute to the viability of the DPS, as well as ensuring there are adequate numbers of fish in stable units and that at least one viable unit occurs in each of the physiographic provinces (Piedmont Upland and Ridge and Valley). This will help to ensure that catastrophic events, such as floods, cannot simultaneously affect all known resilience units of the DPS. Recovery considerations, such as maintaining existing genetic diversity and striving for representation of both physiographic provinces in the DPS's current range, were considered in formulating this proposal.

In developing our conservation strategy for determining which areas to include as critical habitat for the Upper Coosa River DPS, we focused on the existing resilience units and habitats that are presently contributing to the viability or historical units in which resiliency can be improved such that they contribute to viability of the species. In summary, we identified streams and rivers that are both: (1) Currently occupied streams and rivers within the known historical range of the Upper Coosa River DPS, and (2) those areas that have retained the physical or biological features identified earlier that will allow for the maintenance and expansion of existing populations. For the purposes of the proposed critical habitat designation, and for areas within the geographic area occupied by the species at the time of listing, we determined a unit to be occupied if it contains a recent (*i.e.,* observed in the past 11 years (since 2009)) observation (collection) or eDNA record that supports the presence of the species. Within those areas, we delineated critical-habitat-unit boundaries using the following process:

We evaluated habitat suitability of stream and river channels within the geographical area occupied at the time of listing, and retained for further consideration those streams that contain one or more of the physical and biological features to support life-history functions essential to conservation of the Upper Coosa River DPS. We determined the end points of river units by evaluating the presence or absence of appropriate physical and biological features. Our upstream cutoff points for each stream are located approximately where the physiographic province that the frecklebelly madtom occupies begins (where the Conasauga River flows out of the Blue Ridge and into the Ridge and Valley physiographic province and where the Etowah River flows out of the Blue Ridge and into the Piedmont Upland physiographic province) and selected downstream cutoff points that omit areas where habitat conditions are less favorable for the species (*i.e.,* do not contain the physical or biological features essential to the conservation of the DPS).

Based on this analysis, the following rivers meet criteria for areas occupied by the species at the time of listing: Conasauga River, Coosawattee River, and Etowah River. These areas include the two rivers, Conasauga River and Etowah River, known to have been occupied by the DPS historically. Environmental DNA of the frecklebelly madtom was detected in the Conasauga River in 2017 and 2018, which meets the criteria for consideration as an area occupied by the species at the time of listing. In the Etowah River, occurrence data and eDNA records from 2018 are available. These two areas meet our conservation strategy for the frecklebelly madtom. Designating critical habitat of streams in these two occupied resilience units of the DPS, which occur in both physiographic provinces and currently contribute to (or are historical units in which resiliency can be improved to contribute to) the species' viability, will sufficiently lead to the protection, and eventual reduction in risk of extirpation, of the DPS. Improving the resiliency of the resilience units in these two currently occupied streams will likely increase viability to the point that the protections of the Act are no longer necessary.

The proposed designation does not include the Coosawattee River, which is not part of the known historical range of the species. Environmental DNA of the frecklebelly madtom was detected in the Coosawattee River in 2018, which meets

the criteria for consideration as an area occupied by the species at the time of listing. However, since the Coosawattee River is not part of the known historical range of the frecklebelly madtom, this area does not meet our conservation strategy for designating critical habitat for the species. The conservation strategy focused on areas within the historical known range of the species. In addition, since the species has never been directly observed in this river despite multiple surveys over time, using the best available information, we determined this area is not a historical unit in which resiliency can be improved to contribute to the species' viability. Lastly, we determined that sufficient areas (Conasauga River and Etowah River) already have been identified within this proposed designation. Should we receive information during the public comment period that supports designating as critical habitat areas not included in the proposed units (see Proposed Critical Habitat Designation, below), we will reevaluate our current proposal.

We are not currently proposing to designate any areas outside the geographical area occupied by the Upper Coosa River DPS, because we have not identified any unoccupied areas that are essential for the conservation of the species. The protection of the Conasauga River and Etowah River would sufficiently reduce the risk of extinction, and improving the resiliency of these currently occupied streams of the DPS would increase viability to the point that the protections of the Act are no longer necessary.

Sources of data for this proposed designation of critical habitat include multiple databases maintained by universities and State agencies in Tennessee and Georgia, as well as numerous survey reports on streams throughout the DPS's range. Other sources of available information on habitat requirements for this species include studies conducted at occupied sites and published in peer-reviewed articles, agency reports, and data collected during monitoring efforts (Shepard *et al.* 1997, entire; Bennet *et al.* 2008, entire; Bennet and Kuhajda 2010, entire; Albanese *et al.* 2018, entire; Service 2020, entire). Observation and eDNA records were compiled and provided to us by State partners during the SSA analysis.

When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the Upper Coosa River DPS. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We propose to designate as critical habitat lands that we have determined are occupied at the time of listing (*i.e.,* currently occupied) and that contain one or more of the physical or biological features that are essential to support life-history processes of the species. Units are proposed for designation based on one or more of the physical or biological features being present to support the Upper Coosa River DPS's life-history processes. Some units contain all of the identified physical or biological features and support multiple life-history processes. Unit 1 contains only some of the physical or biological features necessary to support the Upper Coosa River DPS's particular use of that habitat. Unit 2 contains all of the identified physical or biological features and supports multiple life-history processes.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on *http://www.regulations.gov* at Docket No. FWS–R4–ES–2020–0058 and on our internet site at *https://www.fws.gov/southeast/.*

Proposed Critical Habitat Designation

We are proposing to designate approximately 134 river miles (mi) (216 river kilometers (km)) in two units as critical habitat for the Upper Coosa River DPS of the frecklebelly madtom. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for the Upper Coosa River DPS. The two units are: (1) Conasauga River Unit and (2) Etowah River Unit. Table 4, below, shows the proposed critical habitat units, land ownership, and the approximate river miles of each unit. Per State regulations (Tennessee Code Annotated section 69–1–101 and Georgia Code section 52–1–31), navigable waters are considered public rights-of-way. Lands beneath the navigable waters included in this proposed rule are owned by the States of Tennessee or Georgia. Ownership of lands beneath nonnavigable waters included in this rule are determined by riparian land ownership. The riparian land adjacent to the proposed critical habitat is 85 percent private, 6 percent local, 5 percent State, and 4 percent Federal lands.

TABLE 4—PROPOSED CRITICAL HABITAT UNITS FOR THE UPPER COOSA RIVER DPS OF THE FRECKLEBELLY MADTOM

Critical habitat unit	Riparian ownership surrounding units	River miles (kilometers)
1. Conasauga River	Private, State, Federal	51.5 (83)
2. Etowah River	Private, Local, State	82.5 (133)
Total		134 (216)

Note: Lengths may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the Upper Coosa River DPS, below.

Unit 1: Conasauga River

Unit 1 consists of approximately 51.5 river mi (83 km) of the Conasauga River beginning at the mouth of Coahulla Creek in Whitfield and Murray Counties, Georgia, and continuing upstream through Bradley County, Tennessee, to the mouth of Graham Branch in Polk County, Tennessee. Unit 1 includes river habitat up to bank full height. Frecklebelly madtom occupies all river reaches in this unit. Unit 1 contains some of the physical or biological features necessary for the conservation of the DPS. Unit 1 possesses those characteristics, as described above under *Summary of Essential Physical or Biological Features,* of essential physical or biological features (1), (2), (3), and (5). Essential physical or biological feature (4) is degraded in this unit, but with appropriate management and restoration actions, this physical or biological feature can be restored.

Special management considerations or protection may be required within Unit 1 to alleviate impacts from stressors that have led to the degradation of the habitat, including sedimentation, pollutant input, excess nutrient input, development, and unstable stream banks. Surrounding land-use practices, including agricultural runoff, agricultural ditching, and erosion have led to high levels of sedimentation, siltation, contamination, and nutrient-loading, as well as destabilized stream banks. Special management considerations related to agricultural and developed areas that will benefit the habitat in this unit include, but are not limited to, riparian buffer restoration, reduced surface and groundwater withdrawals, increased open space in the watershed, and treating wastewater to the highest level practicable.

Unit 2: Etowah River

Unit 2 consists of approximately 82.5 river mi (133 km) of the Etowah River beginning at its confluence with Shoal Creek in Cherokee County, Georgia, and continuing upstream through Forsyth and Dawson Counties to approximately 0.5 miles upstream of the Jay Bridge Road crossing over the Etowah River in Lumpkin County, Georgia. Unit 2 includes river habitat up to bank full height. Frecklebelly madtom occupies all river reaches in this unit. Unit 2 contains all of the physical or biological features necessary for the conservation of the DPS.

Special management considerations or protection may be required within Unit 2 to alleviate impacts from stressors that are anticipated to amplify degradation of the habitat, including sedimentation, pollutant input, excess nutrient input, development, and unstable stream banks. Increased development, including urban development and runoff, dam construction and use, and paved and unpaved roads, in the surrounding watershed and riparian area have led to higher levels of sedimentation, siltation, contamination, and nutrient-loading, as well as destabilized stream banks. Special management considerations related to agricultural and developed areas that will benefit the habitat in this unit include, but are not limited to, riparian buffer restoration, reduced surface and groundwater withdrawals, increased open space in the watershed, and implementing highest levels of treatment of wastewater practicable.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, 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, 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 proposed critical habitat.

We published a final rule revising the definition of destruction or adverse modification on August 27, 2019 (84 FR 44976). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are 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 Clean Water Act (33 U.S.C. 1251 *et seq.*) 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 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.

Compliance with the requirements of section 7(a)(2) is documented through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define ''reasonable and prudent alternatives'' (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Service Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinitiate formal consultation on previously reviewed actions. These requirements apply when the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law) and, subsequent to the previous consultation, we have listed a new

species or designated critical habitat that may be affected by the Federal action, or the action has been modified in a manner that affects the species or critical habitat in a way not considered in the previous consultation. In such situations, Federal agencies sometimes may need to request reinitiation of consultation with us, but the regulations also specify some exceptions to the requirement to reinitiate consultation on specific land management plans after subsequently listing a new species or designating new critical habitat. See the regulations for a description of those exceptions.

Application of the ''Destruction or Adverse Modification'' Standard

The key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As discussed above, the role of critical habitat is to support physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may violate section 7(a)(2) of the Act by destroying or adversely modifying such habitat, or that may be affected by such designation.

Activities that the Service may, during a consultation under section 7(a)(2) of the Act, find are likely to destroy or adversely modify critical habitat include, but are not limited to:

(1) Actions that would alter the minimum flow or existing flow regime. Such activities could include, but are not limited to, impoundment, channelization, water diversion, water withdrawal, hydropower generation, and flood control. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the Upper Coosa River DPS by altering flows to levels that would adversely affect the Upper Coosa River DPS's ability to complete its life cycle.

(2) Actions that would significantly alter water chemistry or quality. Such activities could include, but are not limited to, release of chemicals or biological pollutants into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions to levels that are beyond the tolerances of the Upper Coosa River DPS and result in direct or cumulative adverse effects to individuals and their life cycles.

(3) Actions that would significantly increase sediment deposition within the stream channel. Such activities could include, but are not limited to, excessive sedimentation from livestock grazing, road construction, channel alteration, and other watershed and floodplain disturbances. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the Upper Coosa River DPS by increasing the sediment deposition to levels that would adversely affect the DPS's ability to complete its life cycle.

(4) Actions that would significantly increase eutrophication (the addition of excessive nutrients that are typically limited in aquatic environments, such as nitrogen and phosphorus that cause phytoplankton to proliferate). Such activities could include, but are not limited to, release of excessive nutrients into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could result in excessive nutrients and algae filling streams and reducing habitat, degrading water quality from excessive nutrients and algae decay, and decreasing oxygen levels below the tolerances of the DPS.

(5) Actions that would significantly alter channel morphology or geometry, or decrease connectivity. Such activities could include, but are not limited to, channelization, impoundment, road and bridge construction, mining, dredging, and destruction of riparian vegetation. These activities may lead to changes in water flows and levels that would degrade or eliminate the Upper Coosa River DPS and its habitats. These actions could also lead to increased sedimentation and degradation in water quality to levels beyond the tolerances of the DPS.

(6) Actions that result in the introduction, spread, or augmentation of nonnative aquatic species in occupied stream segments, or in stream segments that are hydrologically connected to occupied stream segments, or introduction of other species that compete with or prey on the Upper Coosa River DPS. Possible actions could include, but are not limited to, stocking of nonnative fishes and crayfishes, or other related actions. These activities could introduce parasites or disease; result in direct predation or direct competition; or affect the growth, reproduction, and survival of the DPS.

Exemptions

Application of Section 4(a)(3) of the Act

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. There are no Department of Defense (DoD) lands within the proposed critical habitat designation.

Consideration of Impacts Under Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making the determination to exclude a particular area, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor.

The first sentence in section 4(b)(2) of the Act requires that we take into consideration the economic, national security, or other relevant impacts of designating any particular area as critical habitat. We describe below the process that we undertook for taking into consideration each category of impacts and our analyses of the relevant impacts.

Consideration of Economic Impacts

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific

critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a proposed critical habitat designation is analyzed by comparing scenarios both ''with critical habitat'' and ''without critical habitat.''

The ''without critical habitat'' scenario represents the baseline for the analysis, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (*e.g.,* under the Federal listing as well as other Federal, State, and local regulations). The baseline, therefore, represents the costs of all efforts attributable to the listing of the species under the Act (*i.e.,* conservation of the species and its habitat incurred regardless of whether critical habitat is designated). The ''with critical habitat'' scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts would not be expected without the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat, above and beyond the baseline costs. These are the costs we use when evaluating the benefits of inclusion and exclusion of particular areas from the final designation of critical habitat should we choose to conduct a discretionary 4(b)(2) exclusion analysis.

For this designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from the proposed designation. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation (IEc 2020, entire). The purpose of the screening analysis is to filter out particular geographic areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (*i.e.,* absent critical habitat designation) and includes probable economic impacts where land and water use may be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the Upper Coosa River DPS. Ultimately, the screening analysis allows us to focus on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. This screening analysis, combined with the information contained in our IEM, comprises our draft economic analysis (DEA) of the proposed critical habitat designation for the Upper Coosa River DPS of the frecklebelly madtom; our DEA is summarized in the narrative below.

Executive Orders (E.O.s) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas likely affected by the critical habitat designation. In our evaluation of the probable incremental economic impacts that may result from the proposed designation of critical habitat for the Upper Coosa River DPS, first we identified, in the IEM dated June 23, 2020, probable incremental economic impacts associated with the following categories of activities: (1) Federal lands management (U.S. Forest Service and U.S. Army Corps of Engineers); (2) agriculture; (3) development; (4) roadway and bridgeway construction; (5) dredging, dams, and diversions; (6) flood control and hydropower; (7) wastewater and chemical discharge; (8) pesticide use; (9) recreation; (10) conservation and restoration; and (11) transportation and utilities. We considered each industry or category individually. Additionally, we considered whether these activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat only affects activities conducted, funded, permitted, or authorized by Federal agencies. In areas where individuals from the Upper Coosa River DPS are found, Federal agencies already are required to ensure that their actions are not likely to jeopardize the continued existence of the DPS under section 7 consultation procedures. If we finalize this proposed critical habitat designation, consultations to avoid the destruction or adverse modification of critical habitat would be incorporated into the existing consultation process.

In our IEM, we attempted to clarify the distinction between the effects that will result from the species being listed and those attributable to the critical habitat designation (*i.e.,* difference between the jeopardy and adverse modification standards) for the Upper Coosa River DPS's critical habitat. Because the designation of critical habitat for the Upper Coosa River DPS was proposed concurrently with the listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would result in sufficient harm or harassment to constitute jeopardy to the Upper Coosa River DPS would also likely adversely affect the essential physical or biological features of critical habitat. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the Upper Coosa River DPS totals approximately 134 river miles (mi) (216 river kilometers (km)) in two occupied units in Georgia and Tennessee. In these areas, any actions that may affect the species would also affect proposed critical habitat because all designated habitat is occupied. Thus, it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the Upper Coosa River DPS. Therefore, the only additional costs that are expected in all of the proposed critical habitat designation are administrative costs. These costs are due to additional consultation analysis requiring time and resources by both the Federal action agency and the Service. However, these costs are not expected to

reach the threshold of ''significant'' under E.O. 12866. We anticipate a maximum of 10 section 7 consultations annually at a total incremental cost of less than $11,000 per year.

We are soliciting data and comments from the public on the DEA discussed above, as well as all aspects of this proposed rule and our required determinations. During the development of a final designation, we will consider the information presented in the DEA and any additional information on economic impacts received during the public comment period to determine whether any specific areas should be excluded from the final critical habitat designation under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19. In particular, we may exclude an area from critical habitat if we determine that the benefits of excluding the area outweigh the benefits of including the area, provided the exclusion will not result in the extinction of this species.

The final decision on whether to exclude any areas will be based on the best scientific data available at the time of the final designation, including information we obtain during the public comment period and information about the economic impact of designation. Accordingly, we have prepared a draft economic analysis concerning the proposed critical habitat designation, which is available for review and comment (see **ADDRESSES**).

Consideration of National Security Impacts

In preparing this proposal, we have determined that the lands within the proposed designation of critical habitat for the Upper Coosa River DPS are not owned, managed, or used by the DoD or DHS where a national security or homeland security impact might exist, and, therefore, we anticipate no impact on national security or homeland security. However, during the development of a final designation, we will consider any additional information received through the public comment period on the impacts of the proposed designation on national security or homeland security to determine whether any specific areas should be excluded from the final critical habitat designation under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19.

Consideration of Other Relevant Impacts

We consider a number of factors, including whether there are permitted conservation plans covering the species in the area such as HCPs, safe harbor agreements (SHAs), or candidate conservation agreements with assurances (CCAAs), or whether there are non-permitted conservation agreements and partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at the existence of Tribal conservation plans and partnerships and consider the government-to-government relationship of the United States with Tribal entities. We also consider any social impacts that might occur because of the designation.

In preparing this proposal, we have determined that there are currently no draft or final HCPs or other management plans for the Upper Coosa River DPS, and the proposed designation does not include any Tribal lands or trust resources.

As discussed above, we anticipate no impacts on national security, economic, or any other relevant impacts as a result of this designation. Accordingly, at this time, we do not propose to exclude any particular areas from the critical habitat designation. However, during the development of a final designation, we will consider any additional information we receive through the public comment period regarding other relevant impacts to determine whether any specific areas should be excluded from the final critical habitat designation under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 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.

Regulatory Planning and Review (Executive Orders 12866 and 13563)

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget will review all significant rules. OIRA has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this proposed rule in a manner consistent with these requirements.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 *et seq.*), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.,* small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500

employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine whether potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

Under the RFA, as amended, and as understood in the light of recent court decisions, Federal agencies are required to evaluate the potential incremental impacts of rulemaking only on those entities directly regulated by the rulemaking itself and, therefore, are not required to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried out by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies would be directly regulated if we adopt the proposed critical habitat designation. There is no requirement under the RFA to evaluate the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities would be directly regulated by this rulemaking, the Service certifies that, if made final as proposed, the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the proposed designation would result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we certify that, if made final, the proposed critical habitat designation will not have a significant economic impact on a substantial number of small business entities. Therefore, an initial regulatory flexibility analysis is not required.

Executive Order 13771

This proposed rule is not a regulatory action subject to Executive Order (E.O.) 13771 (''Reducing Regulation and Controlling Regulatory Costs'') (82 FR 9339, February 3, 2017) regulatory action because this rule is not significant under E.O. 12866.

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. The Office of Management and Budget (OMB) provides guidance for implementing this Executive Order, outlining nine outcomes (criteria) that may constitute ''a significant adverse effect'' when compared with the regulatory action under consideration. The economic analysis finds that none of these criteria are relevant to this analysis, and therefore, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following finding:

(1) This proposed rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or Tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule would significantly or uniquely affect small governments, because it will not produce a Federal mandate of $100 million or greater in any year, that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments and, as such, a Small Government Agency Plan is not required.

Takings—Executive Order 12630

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for Upper Coosa River DPS in a takings

implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed for the proposed designation of critical habitat for Upper Coosa River DPS, and it concludes that, if adopted, this designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have substantial direct effects either on the States, or on the relationship between the national government and the States, or on the distribution of powers and responsibilities among the various levels of government. The proposed designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform—Executive Order 12988

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule would not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this proposed rule identifies the elements of physical or biological features essential to the conservation of the species. The proposed areas of designated critical habitat are presented on maps, and the proposed rule provides several options for the interested public to obtain more detailed location information, if desired.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain information collection requirements, and a submission to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*) is not required. We may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

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

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA), need not be prepared in connection with listing a species as an endangered or threatened species under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

It is also our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the NEPA in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

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), Executive Order 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 recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial 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 identified no Tribal interests that would be affected by this proposed listing. We have also determined that no Tribal lands fall within the boundaries of the proposed critical habitat for the Upper Coosa River DPS, 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 *http://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, Reporting and

recordkeeping requirements, Transportation.

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. Amend § 17.11(h) by adding an entry for ''Madtom, frecklebelly [Upper Coosa River DPS]'' to the List of Endangered and Threatened Wildlife in alphabetical order under FISHES to read as set forth below:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	*
FISHES				
*	*	*	*	*
Madtom, frecklebelly [Upper Coosa River DPS].	*Noturus munitus*	Upper Coosa River Basin (GA, TN).	T	[**Federal Register** citation when published as a final rule]; 50 CFR 17.44(ee); [4d] 50 CFR 17.95(e).[CH]
*	*	*	*	*

■ 3. Amend § 17.44 by reserving paragraphs (cc) and (dd), and by adding a paragraph (ee) to read as set forth below:

§ 17.44 Special rules—fishes.

* * * * *

(cc) [Reserved]

(dd) [Reserved]

(ee) Upper Coosa River DPS of the frecklebelly madtom (*Noturus munitus*).

(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the Upper Coosa River DPS. Except as provided under paragraph (ee)(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 DPS:

(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 specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of a 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 DPS, 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) 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* spp.).

(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 DPS. Stream banks may be stabilized using live stakes (live, vegetative cuttings inserted or tamped into the ground in a manner that allows the stake to take root and grow), live fascines (live branch cuttings, usually willows, bound together into long, cigar-shaped bundles), or 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 (rip-rap) or the use of rock baskets or gabion structures.

(C) Projects carried out in the DPS's range under the Working Lands for Wildlife program of the Natural Resources Conservation Service, U.S. Department of Agriculture, or similar projects conducted by the U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program or the Environmental Protection Agency's 319 Grant Program, that are implemented with a primary objective of improving environmental conditions to support the native, aquatic biodiversity of flowing water habitats.

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

* * * * *

■ 4. Amend § 17.95(e) by adding an entry for ''Frecklebelly Madtom [Upper Coosa River DPS] (*Noturus munitus*)'', in the same alphabetical order that it appears in the table at § 17.11(h), to read as set forth below:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(e) *Fishes.*

* * * * *

Frecklebelly Madtom [Upper Coosa River DPS] (*Noturus munitus*)

(1) Critical habitat units are depicted for Bradley and Polk Counties, Tennessee, and Cherokee, Dawson, Forsyth, Lumpkin, Murray, and Whitfield Counties, Georgia, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the Upper Coosa River distinct population segment (DPS) consist of the following components:

(i) Geomorphically stable, medium to large streams with:

(A) Stable stream channels that maintain lateral dimensions, longitudinal profiles, and sinuosity

patterns over time without an aggrading or degrading bed elevation; and

(B) Banks with intact riparian cover to maintain stream morphology and reduce erosion and sediment inputs.

(ii) Connected instream habitats that:

(A) Include stable riffle-run-pool complexes;

(B) Consist of silt-free gravel, coarse sand, cobble, boulders, woody structure, and river weed (*Podostemum* spp.); and

(C) Have abundant cobble, boulders, woody structure, or other suitable cover used for nesting.

(iii) Adequate flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain instream habitats and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the fish's habitat, food availability, and ample oxygenated flow for spawning and nesting habitat.

(iv) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; ammonia; heavy metals; pesticides; animal waste products; and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(v) Diversity and availability of aquatic macroinvertebrate prey items, which include larval midges, mayflies, caddisflies, dragonflies, and beetles.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on the effective date of the rule.

(4) *Critical habitat map units.* Data layers defining map units were selected from the U.S. Geological Survey National Hydrological Dataset—High Resolution (1:24,000 scale; Geographic Coordinate System North American 1983 coordinates) using mapping software. The selected river reaches were informed by species occurrence data. All layers use Universal Transverse Mercator (UTM) Zone 16N coordinates. We also used the mapping software to calculate the length of the units. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points on which each map is based are available to the public at the Service's internet site at *https://www.fws.gov/southeast/,* at *http://www.regulations.gov* at Docket No. FWS–R4–ES–2020–0058, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) *Note:* Index map follows:

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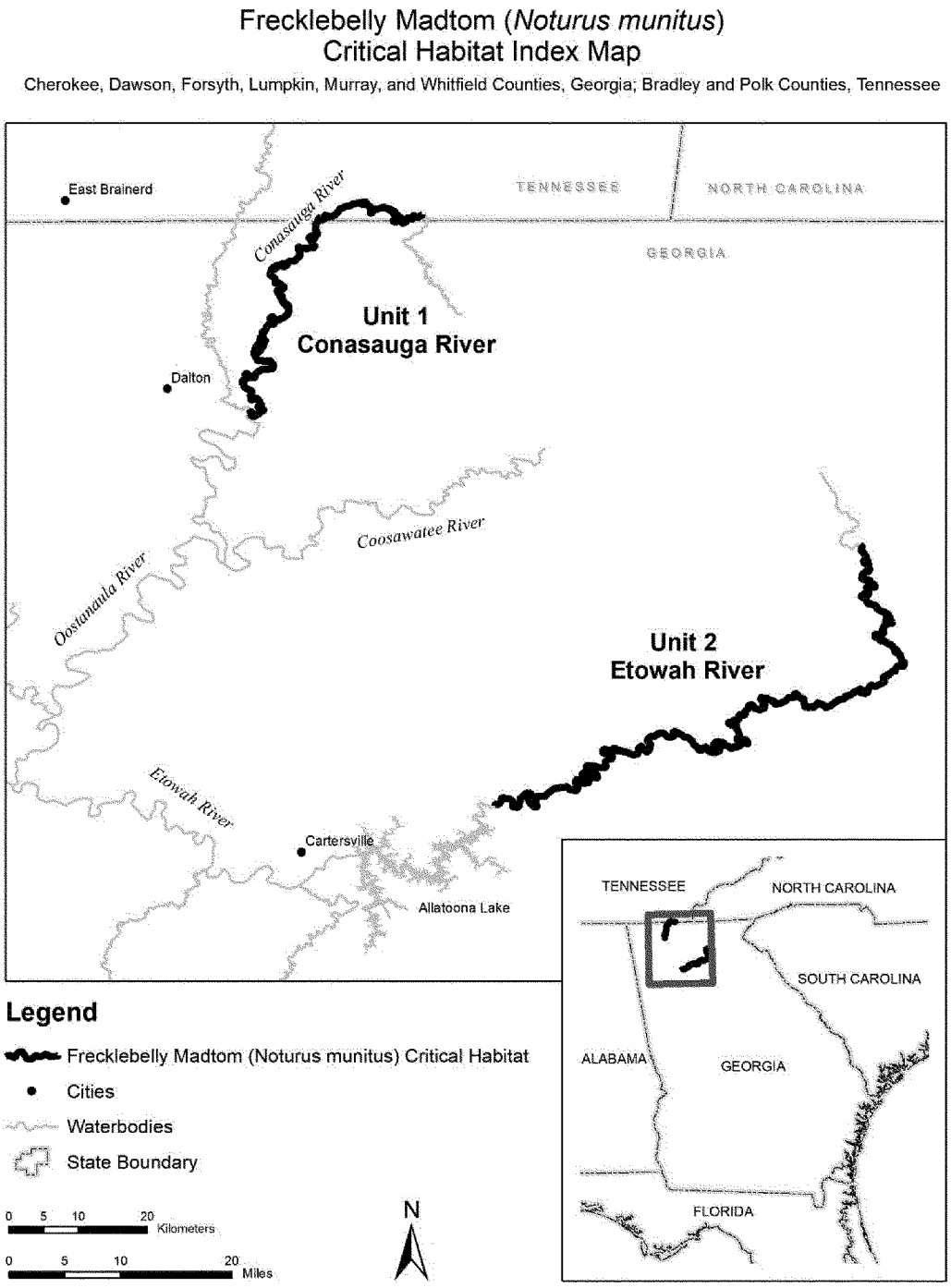
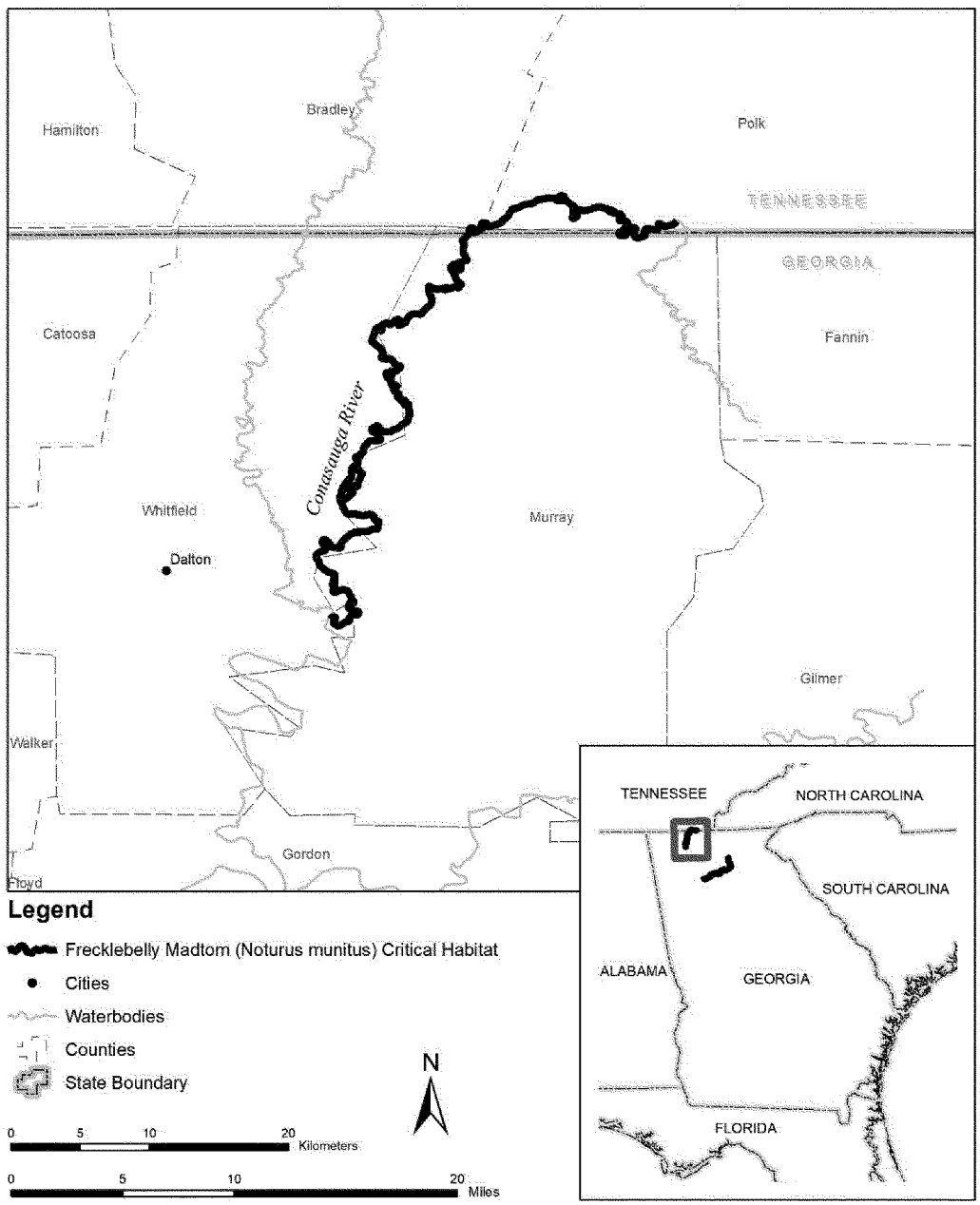


(6) Unit 1: Conasauga River; Bradley and Polk Counties, Tennessee, and Murray and Whitfield Counties, Georgia.

(i) *General description:* Unit 1 consists of 51.5 river miles (83 kilometers) of the Conasauga River beginning at the mouth of Coahulla Creek in Murray and Whitfield Counties, Georgia, and continuing upstream through Bradley County, Tennessee, to the mouth of Graham Branch in Polk County, Tennessee. Unit 1 includes river habitat up to bank full height.

(ii) Map of Unit 1 follows:

Frecklebelly Madtom (*Noturus munitus*)
Critical Habitat Unit 1: Conasauga River
Murray and Whitfield Counties, Georgia; Bradley and Polk Counties, Tennessee

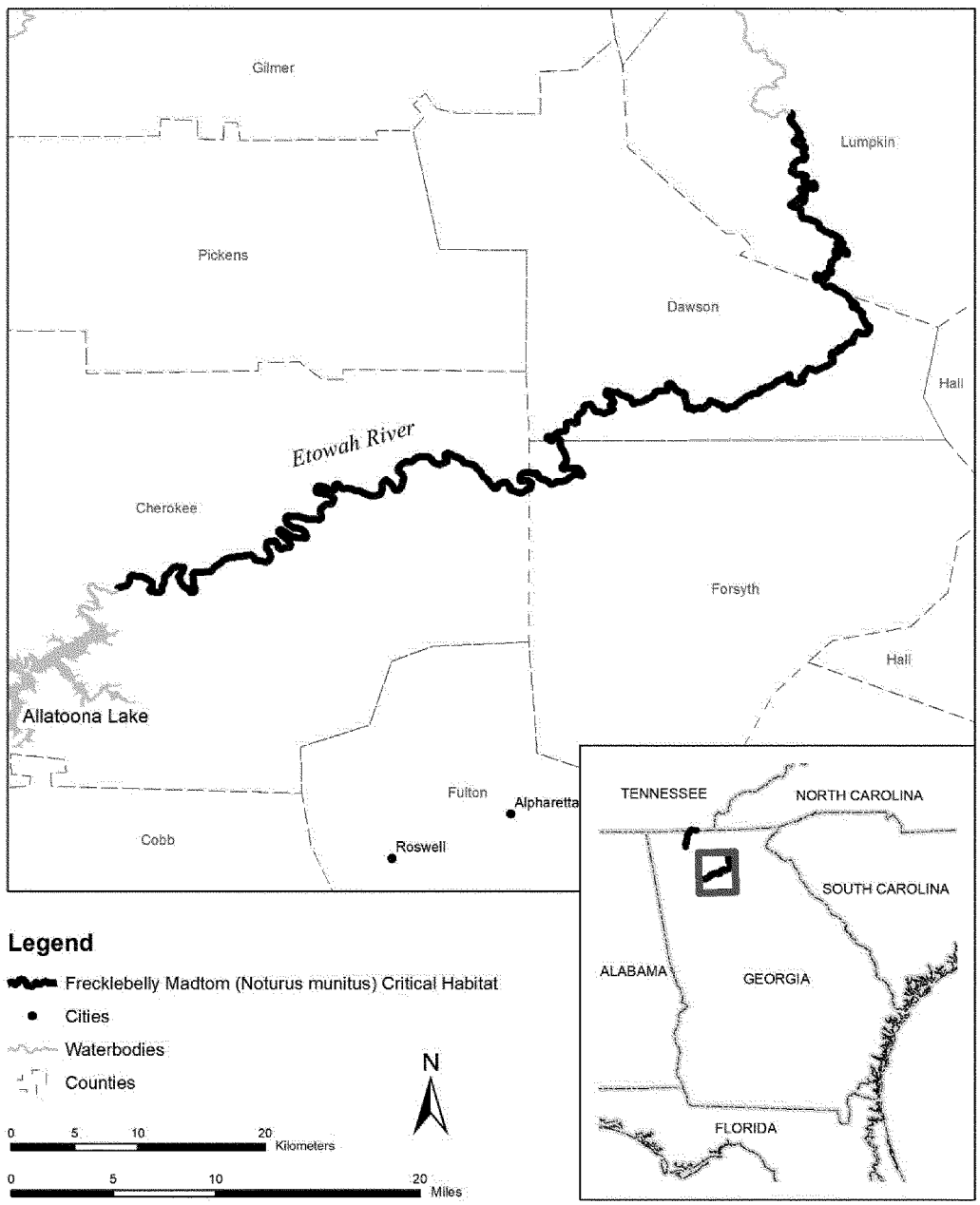


(7) Unit 2: Etowah River, Cherokee, Dawson, Forsyth, and Lumpkin Counties, Georgia.

(i) *General description:* Unit 2 consists of 82.5 river miles (133 kilometers) of the Etowah River beginning at its confluence with Shoal Creek in Cherokee County, Georgia, and continuing upstream through Forsyth and Dawson Counties to approximately 0.5 miles upstream of the Jay Bridge Road crossing over the Etowah River in Lumpkin County, Georgia. Unit 2 includes river habitat up to bank full height.

(ii) Map of Unit 2 follows:

Frecklebelly Madtom (*Noturus munitus*)
Critical Habitat Unit 2: Etowah River
Cherokee, Dawson, Forsyth, and Lumpkin Counties, Georgia



* * * * *

Aurelia Skipwith
Director, U.S. Fish and Wildlife Service.
[FR Doc. 2020–24208 Filed 11–18–20; 8:45 am]
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