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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2018–0069; 4500030113]

RIN 1018-BD36

Endangered and Threatened Wildlife and Plants; Threatened Species Status with Section 4(d) Rule and Critical Habitat Designation for Slenderclaw Crayfish

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule and 12-month finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the slenderclaw crayfish (*Cambarus cracens*) as an endangered or threatened species under the Endangered Species Act of 1973 (Act), as amended. The slenderclaw crayfish is a relatively small, cryptic freshwater crustacean that is endemic to streams on Sand Mountain within the Tennessee River Basin in DeKalb and Marshall Counties, Alabama. After review of the best available scientific and commercial information, we find that listing the slenderclaw crayfish is warranted. Accordingly, we propose to list it as a threatened species. If we finalize this rule as proposed, it would extend the Act's protections to this species and, accordingly, add this species to the List of Endangered and Threatened Wildlife. We also propose a rule under the authority of section 4(d) of the Act that provides measures that are necessary and advisable to provide for the conservation of the slenderclaw crayfish. In addition, we propose to designate approximately 78 river miles (126 river kilometers) in Alabama as critical habitat for the species under the Act. We announce the availability of a draft economic analysis of the proposed

designation of critical habitat.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: *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–2018–0069, 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, click on 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 or hand-delivery to: Public Comments Processing, Attn: FWS–R4–ES–2018–0069, U.S. Fish and Wildlife Service, MS: BPHC, 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).

Supporting materials: The species status assessment (SSA) report and other materials relating to this listing 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–2018–0069.

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–2018–0069, and at the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we may develop for this 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*. In addition, the draft economic analysis of the proposed critical habitat designation is available at *https://www.fws.gov/southeast/*, at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069, and at the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

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 to list the species 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.

This rule proposes the listing of the slenderclaw crayfish (*Cambarus cracens*) as a threatened species, proposes a rule under the authority of section 4(d) of the Act that provides measures that are necessary and advisable to provide for the conservation of the slenderclaw crayfish, and proposes the designation of critical habitat for this species.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species based on 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 competition from a nonnative species (Factors A and E) and habitat degradation resulting from poor water quality (Factor A) pose the largest risk to the future viability of the slenderclaw crayfish.

Under section 4(a)(3) of the Act, we must, to the maximum extent prudent and determinable, designate critical habitat for the species concurrent with the listing determination. Section 4(b)(2) of the Act requires the Secretary of the Interior (Secretary) to designate critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat. 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 protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed if such areas are essential to the conservation of the species. In accordance with section 4(b)(2) of the Act, we prepared an analysis of the economic impacts of the proposed critical habitat designation.

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 six appropriate specialists regarding the species status assessment report, which informs this proposed rule. The purpose of peer review is to ensure that our listing determination, critical habitat determination, and 4(d) rule are based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in crayfish biology, habitat, and stressors to the species.

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. Because we will consider all comments and information we receive during the comment period, our final determinations may differ from this proposal. We particularly seek comments concerning:

(1) The slenderclaw crayfish's biology, range, abundance, and population trends, including:

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

(b) Genetics and taxonomy;

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

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

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

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

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

(4) Additional information concerning the historical and current status, range, distribution, and population size of this species, including the locations of any additional populations of this species.

(5) Additional information concerning the nonnative virile crayfish (*Faxonius virilis*), including:

(a) Distribution, rate of spread, and effects of the virile crayfish on the slenderclaw crayfish; and

(b) Biological techniques or methods to control and manage the virile crayfish.

(6) Information on activities which might warrant consideration in the rule issued under section 4(d) of the Act (16 U.S.C. 1531 *et seq*.), including:

(a) Whether the provision in the proposed 4(d) rule related to streambank stabilization activities should be revised to include additional restrictions; and

(b) Additional provisions the Service may wish to consider for a 4(d) rule in order to conserve, recover, and manage the slenderclaw crayfish, such as the management of invasive species.

(7) The reasons why designation of habitat as "critical habitat" under section 4 of the Act is or is not prudent, including whether there are threats to the species from human activity and/or a lack of benefits of designating critical habitat.

(8) Specific information on:

(a) The amount and distribution of slenderclaw crayfish habitat;

(b) What areas, that were occupied at the time of listing and that contain the physical or biological features essential to the conservation of the species, should be included in the designation and why;

(c) 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

(d) What areas not occupied at the time of listing are essential for the conservation of the species and why.

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

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

(11) 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.

(12) 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.

(13) 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.

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**.

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. All comments submitted electronically via *http://www.regulations.gov* will be presented on the website in their entirety as submitted. For comments submitted via hardcopy, we will post your entire comment—including your personal identifying information—on *http://www.regulations.gov*. You may request at the top of your document that we withhold personal information such as your street address, phone number, or e-mail address from public review; however, we cannot guarantee that we will be able to do so.

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*, or by appointment, during normal business hours, at the U.S. Fish

and Wildlife Service, Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Please note that submissions merely stating support for or opposition to the listing 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 threatened species must be made "solely on the basis of the best scientific and commercial data available." We also invite additional comments from peer reviewers during the public comment period.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests for a public hearing must be received by the date specified in **DATES** at 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 that hearing, as well as how to obtain reasonable accommodations, in the *Federal Register* and local newspapers at least 15 days before the hearing.

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 slenderclaw crayfish, 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 slenderclaw crayfish. On June 17, 2014, the Center for Biological Diversity filed a complaint against the Service for failure to complete a 12-month finding for the slenderclaw crayfish in

accordance with statutory deadlines. On September 22, 2014, 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 slenderclaw crayfish no later than September 30, 2018 (*Center for Biological Diversity* v. *Jewell*, case 1:14–CV–01021–EGS/JMF). We have conducted the species status assessment (SSA) for the species, and this document constitutes our concurrent 12-month warranted petition finding, proposed listing rule, and proposed critical habitat rule.

Species Status Assessment Report

An SSA team prepared an SSA report for the slenderclaw crayfish. 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 SSA report underwent independent peer review by scientists with expertise in crayfish biology, habitat management, and stressors (factors negatively affecting the species) to the slenderclaw crayfish. The 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–2018–0069.

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the slenderclaw crayfish is presented in the SSA report (Service 2018, entire; available at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069).

Species Description

The slenderclaw crayfish is a relatively small, cryptic freshwater crustacean that is endemic to streams on Sand Mountain within the Tennessee River Basin in DeKalb and Marshall Counties, Alabama. This species is a stream-dwelling crayfish and is considered a tertiary burrower (Bearden 2017, pers. comm.). The slenderclaw crayfish was described in 1976, from collections from Short Creek in Marshall County, Alabama (Bouchard and Hobbs 1976, p. 7). The largest individual collected was a female with a carapace length of 1.56 inches (in) (39.7 millimeters (mm)), and reproductively-active males have ranged from 1.09 in (27.7 mm) to 1.47 in (37.3 mm) in carapace length (Bouchard and Hobbs, pp. 7–8). The slenderclaw crayfish is likely sexually mature at 1 year of age and has a lifespan of 2 to 3 years (Schuster 2017, pers. comm.).

Distribution

The slenderclaw crayfish is known to occupy streams in two adjacent watersheds, Short Creek and Town Creek, leading into Guntersville Lake on the Tennessee River in Alabama. The historical (1970–1974) range of the slenderclaw crayfish included four small streams or tributaries within the two watersheds, and the species was known from five sites: one site in Short Creek, one site in Shoal Creek, and two sites in Scarham Creek within the Short Creek population; and one site in Bengis Creek within the Town Creek population (Bouchard and Hobbs 1976, p. 7). The slenderclaw crayfish is currently extant at five sites: three sites in Shoal Creek within the Short Creek population, and two sites (one in Bengis Creek and one in Town Creek) within the Town Creek population. The species is presumed extirpated from four historically occupied sites, including the type locality within the Short Creek population.

Habitat

The slenderclaw crayfish occupies small to medium flowing streams (typically 20 feet (ft) (6.1 meters (m)) wide or smaller, with depths of 2.3 ft (0.7 m) or shallower), intact riparian cover, and boulder/cobble structure (Bouchard and Hobbs 1976, p. 8; Bearden 2017, pers. comm.). The stream habitat consists of predominately large boulders and fractured bedrock in sites from the Short Creek watershed (Bouchard and Hobbs 1976, p. 8; Bearden 2017, pers. comm.) and streams dominated by smaller substrate types with a mix of gravel and cobble in sites from the Town Creek watershed (Bearden 2017, pers. comm.). The species needs abundant interstitial space within each habitat type for sheltering (Schuster 2017, pers. comm.; Taylor 2017, pers. comm.) and adequate seasonal water flows to maintain benthic habitats and maintain connectivity of streams. During low stream flow periods, slenderclaw crayfish appear to use any available water, so during the low water flow events, individuals have been found in pool habitats or near undercut banks (Bearden 2017, pers. comm.). Slenderclaw crayfish likely feed upon aquatic macroinvertebrates in the juvenile stage and shift toward omnivory in the adult stage (Schuster 2017, pers. comm.).

Summary of Biological Status and Threats

Section 4(a)(1) of the Act directs us to determine whether any species is an endangered species or a threatened species because of one or more of five factors affecting its continued existence: (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 SSA report documents the results of our comprehensive biological status review for the slenderclaw crayfish, including an assessment of these potential stressors to the species (factors). It does not represent a decision by the Service on whether the species should be proposed for listing as an endangered or a threatened species under the Act. It does, however,

provide the scientific basis that informs our regulatory decision, which involves 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.

To assess slenderclaw crayfish viability, we used the three conservation biology principles of resiliency, representation, and redundancy (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency refers to the ability of a species to withstand environmental and demographic stochasticity (for example, wet or dry years, flood events); representation refers to the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes); and redundancy refers to the ability of the species to withstand catastrophic events (for example, droughts). In general, the more redundant and resilient 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 factors, both beneficial and risk, influencing the species' viability.

The SSA process can be divided into three sequential stages. During the first stage, we evaluated the life-history needs of individual slenderclaw crayfish, assessed the historical and current distribution of the species, and delineated populations. During the next stage, we assessed the current condition of the species' demographics and habitat characteristics, including explaining how it arrived at its current condition. In the final stage, we made predictions about the species' responses to positive and negative environmental and anthropogenic influences. This process used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We utilized this information to inform our regulatory decision in this finding.

To evaluate the current and future viability of the slenderclaw crayfish, we assessed a range of conditions to allow us to consider the species' resiliency, representation, and redundancy. Populations were delineated using the U.S. Geological Survey Hydrological Unit Code (HUC) 12 watershed boundaries and tributaries leading to the Tennessee River, which species experts identified as the most appropriate unit for assessing population-level resiliency; this delineation aligned with the two watersheds, Short and Town Creeks, that slenderclaw crayfish historically occupied.

To assess resiliency, we qualitatively analyzed data related to two demographic factors (abundance and evidence of reproduction) and two habitat factors (presence of virile crayfish and water quality). Overall population condition rankings were determined by combining the demographic and habitat factors.

Finally, we described representation for the slenderclaw crayfish in terms of habitat variability (known from two slightly different habitat types) and morphometric variability (as described above under *Species Description*). We assessed slenderclaw crayfish redundancy by evaluating the number and distribution of resilient populations throughout the species' range.

Current Condition of Slenderclaw Crayfish

The historical range of the slenderclaw crayfish included two known populations, Short and Town Creeks, in watersheds leading into the Tennessee River in Alabama. Within the Short Creek population, 90 total slenderclaw crayfish, with 56 of those being juveniles, were collected from 1970–1974 (Bouchard and Hobbs 1976, entire; Schuster 2017, unpublished data). Only one crayfish was historically collected in the Town Creek population from 1970–1974 (Bouchard and Hobbs 1976, entire; Schuster 2017, unpublished data). Surveys conducted from 2009–2017 have documented the slenderclaw crayfish within the same two populations, Short Creek (three

sites in Shoal Creek) and Town Creek (one site in Bengis Creek and one site in Town Creek) (Kilburn *et al.* 2014, pp. 116–117; Bearden *et al.* 2017, pp. 17–18; Schuster 2017, unpublished data; Taylor 2017, unpublished data). Of the five historical sites, the slenderclaw crayfish is no longer found and is presumed extirpated at four sites (one site in Short Creek, two sites in Scarham Creek, and one site in Bengis Creek) despite repeated survey efforts (Kilburn *et al.* 2014, pp. 116–117; Bearden *et al.* 2017, pp. 17–18; Schuster 2017, unpublished data; Taylor 2017, unpublished data). Across current survey efforts from 2009–2017, 28 slenderclaw crayfish, including 2 juveniles, were collected within the Short Creek population, and 2 adult and 2 juvenile slenderclaw crayfish were collected from the Town Creek population. It should be noted that there are no actual historical or current population estimates for slenderclaw crayfish, and the abundance numbers (total number collected) reported are not population estimates.

At the population level, the overall current condition in terms of resiliency was estimated to be low for both Short Creek and Town Creek populations. We estimated that the slenderclaw crayfish currently has some adaptive potential (i.e., representation) due to the habitat variability features occurring in the Short Creek and Town Creek populations. The Short Creek population occurs in streams with predominantly large boulders and fractured bedrock, broader stream widths, and greater depths, and the Town Creek population occurs in streams with larger amounts of gravel and cobble, narrower stream widths, and shallower depths (Bearden 2017, pers. comm.). At present, the slenderclaw crayfish has two populations in low condition (resiliency) with habitat types that vary between populations. Therefore, given the variable habitat in which the slenderclaw crayfish occurs, the species may have some level of adaptive capacity, given the low resiliency of both populations of the slenderclaw crayfish, current representation is reduced.

The slenderclaw crayfish exhibits limited redundancy given its narrow range and that four out of five sites within the species' historical range are presumed extirpated. In addition, connectivity between the Short Creek and Town Creek populations is likely low, because both Short and Town Creek streams flow downstream into, and thus are separated by, Guntersville Lake. To date, no slenderclaw crayfish have been documented in impounded areas including Guntersville Lake. Multiple sites in the same population could allow recolonization following a catastrophic event (*e.g.*, chemical spill) that may affect a large proportion of a population; however, given the species' limited redundancy and current low resiliency of both populations, it might be difficult to re-establish an entire population affected by a catastrophic event, as the connectivity between the two populations is low. Further, the currently occupied sites in the Short Creek population are in a single tributary, and one catastrophic event could impact this entire population.

Risk Factors for Slenderclaw Crayfish

We reviewed the potential risk factors (see discussion of section 4(a)(1) of the Act, above) that are affecting the slenderclaw crayfish now and are expected to affect it into the future. We have determined that competition from a nonnative species (Factors A and E) and habitat degradation resulting from poor water quality (Factor A) pose the largest risk to the future viability of the slenderclaw crayfish. Other potential stressors to the species are hydrological variation and alteration (Factors A and E), land use (Factor A), low abundance (Factor E), and scientific collection (Factor B). There are currently no existing regulatory mechanisms that adequately address these threats to the slenderclaw crayfish such that it does not warrant listing under the Act (Factor D). We find the species does not face significant threats from disease or predation (Factor C). We also reviewed the conservation efforts being

undertaken for the habitat in which the slenderclaw crayfish occurs. A brief summary of relevant stressors is presented below; for a full description, refer to chapter 3 of the SSA report.

Nonnative Species

The virile crayfish (*Faxonius virilis*), previously recognized as *Orconectes virilis* (Crandall and De Grave 2017, p. 5), is a crayfish native to the Missouri, upper Mississippi, lower Ohio, and the Great Lakes drainages (USFWS 2015, p. 1). The species has spread from its native range through dispersal as fishing bait, as pets, and through commercial (human) consumption (Schwartz *et al.* 1963, p. 267; USFWS 2015, p. 4). Virile crayfish inhabit a variety of watersheds in the United States, including those with very few to no native crayfish species, and have been documented in lake, wetland, and stream environments (Larson *et al.* 2010, p. 2; Loughman and Simon 2011, p. 50). Virile crayfish are generalists, able to withstand various conditions, and have the natural tendency to migrate (Loughman and Simon 2011, p. 50). This species has been documented to spread approximately 124 mi (200 km) over 15 years (B. Williams 2018, pers. comm.; Williams *et al.* 2011, entire).

Based on comparison of body size, average claw size, aggression levels, and growth rates, it appears that virile crayfish has an ecological advantage over several native crayfish species, including those in the *Cambarus* and *Procambarus* genera (Hale *et al.* 2016, p. 6). In addition, virile crayfish have been documented to displace native crayfish (Hubert 2010, p. 5).

Virile crayfish were first collected near the range of slenderclaw crayfish in 1967 (Schuster 2017, unpublished data). Since then, the virile crayfish has been documented in Guntersville Lake (a Tennessee Valley Authority reservoir constructed in 1939, on the Tennessee River mainstem) (Schuster 2017, unpublished data; Taylor 2017, unpublished data). In addition, the virile crayfish was found at the type locality (location where the species was first

described) for the slenderclaw crayfish in Short Creek (Short Creek population) in 2015, in which the slenderclaw crayfish no longer occurs (Schuster 2017, unpublished data; Taylor 2017, unpublished data). In 2016, the virile crayfish was found at two sites in Drum Creek within the Short Creek population boundary and at the confluence of Short Creek and Guntersville Lake (Schuster 2017, unpublished data; Taylor 2017, unpublished data). During 2017, 20 virile crayfish were found again at the location where slenderclaw crayfish was first described in Short Creek (Taylor 2017, unpublished data). Also during 2017, this nonnative crayfish was documented at four new sites in adjacent watersheds outside of the Short Creek population boundary. Juvenile virile crayfish have been collected in the Short Creek population, indicating that the species is established there (Taylor 2017, unpublished data). To date, no virile crayfish have been documented within the Town Creek population boundary (Schuster 2017, unpublished data; Taylor 2017, unpublished data).

The adaptive nature of the virile crayfish, the effects of this nonnative species on other crayfish species in their native ranges, and records of the virile crayfish's presence in the slenderclaw crayfish's historical and current range indicate that the virile crayfish is a factor that negatively influences the viability of the slenderclaw crayfish in the near term and future. Also, considering that the virile crayfish is a larger crayfish, is a strong competitor, and tends to migrate, while the slenderclaw crayfish has low abundance and is a smaller-bodied crayfish, it is reasonable to infer that once the virile crayfish is established at a site, it will out-compete slenderclaw crayfish.

Water Quality

Direct impacts of poor water quality on the slenderclaw crayfish are unknown; however, aquatic macroinvertebrates (*i.e.*, mayflies, caddisflies, stoneflies) are known to be negatively

affected by poor water quality, and this may indirectly impact the slenderclaw crayfish, which feeds on them. Degradation of water quality has been documented to impact aquatic macroinvertebrates and may even cause stress to individual crayfish (Arthur *et al.* 1987, p. 328; Devi and Fingerman 1995, p. 749; Rosewarne *et al.* 2014, p. 69). Although crayfish generally have a higher tolerance to ammonia than some aquatic species (*i.e.*, mussels), their food source, larval insects, is impacted by ammonia at lower concentrations (Arthur *et al.* 1987, p. 328). Juvenile slenderclaw crayfish likely feed exclusively on aquatic macroinvertebrates, which are impacted by elevated ammonia and poor water quality.

Within the range of the slenderclaw crayfish, Scarham Creek and Town Creek were identified as impaired waters by the Alabama Department of Environmental Management (ADEM), and were listed on Alabama's 303(d) list of impaired water bodies (list of waterbodies that do not meet established state water quality standards) in 1996 and 1998, respectively (ADEM 1996, p. 1; ADEM 2001, p. 11). Scarham Creek was placed on the 303(d) list for impacts from pesticides, siltation, ammonia, low dissolved oxygen/organic enrichment, and pathogens from agricultural sources; this section of Scarham Creek stretched 24 mi (39 km) upstream from its confluence with Short Creek to its source (ADEM 2013, p. 1). However, Scarham Creek was removed from Alabama's 303(d) list of impaired waters in 2004, after the total maximum daily loads (TMDLs; maximum amount of a pollutant or pollutants allowed in a water body while still meeting water quality standards) were developed in 2002 (ADEM 2002, p. 5; ADEM 2006, entire). Town Creek was previously listed on the 303(d) list for ammonia and organic enrichment/dissolved oxygen impairments. Although TMDLs have been in development for these issues (ADEM 1996, entire), all of Town Creek is currently on the 303(d) list for mercury contamination due to atmospheric deposition (ADEM 2016a, appendix C). One

identified source of wastewater discharge to Town Creek is Hudson Foods near Geraldine, Alabama (ADEM 1996, p. 1).

Pollution from nonpoint sources stemming from agriculture, animal production, and unimproved roads has been documented within the range of the slenderclaw crayfish (Bearden *et al.* 2017, p. 18). Alabama is ranked third in the United States for broiler (chicken) production (Alabama Poultry Producers 2017, unpaginated), and DeKalb and Marshall Counties are two of the four most active counties in Alabama for poultry farming (Conner 2008, unpaginated). Poultry farms and poultry litter (a mixture of chicken manure, feathers, spilled food, and bedding material that frequently is used to fertilize pastureland or row crops) have been documented to contain nutrients, pesticides, bacteria, heavy metals, and other pathogens (Bolan *et al.* 2010, pp. 676–683; Stolz *et al.* 2007, p. 821). A broiler house containing 20,000 birds will produce approximately 150 tons of litter a year (Ritz and Merka 2013, p. 2). Surface-spreading of litter allows runoff from heavy rains to carry nutrients from manure into nearby streams. Poultry litter spreading is a practice that occurs within the Short Creek watershed (Short Creek population of slenderclaw crayfish) (TARCOG 2015, p. 8).

During recent survey efforts for the slenderclaw crayfish, water quality analysis indicated that water quality was impaired due to nutrients and bacteria within the Short Creek population, and levels of atrazine may be of concern in the watershed (Bearden *et al.* 2017, p. 32). In Bengis Creek (Town Creek population), water quality analysis found lead measurements that exceeded the acute and chronic aquatic life criteria set by the U.S. Environmental Protection Agency and ADEM (Bearden *et al.* 2017, p. 32; ADEM 2017, p. 10-7). These criteria are based on levels developed by the U.S. Environmental Protection Agency and ADEM to protect fish and wildlife (ADEM 2017, entire), and exceedance of these values is likely to harm animal or plant life (U.S.

Environmental Protection Agency 2018b, unpaginated). Elevated ammonia concentrations in Town Creek were also documented and reflected nonpoint source pollution at low flow and high flow measurements (Bearden *et al.* 2017, p. 21). In late summer and fall surveys, potential eutrophication likely stemming from low water conditions, elevated nutrients, and low dissolved oxygen was documented within both Short and Town Creek watersheds (Bearden *et al.* 2017, p. 31).

Hydrological Alteration and Variation

Dams and reservoirs on the Tennessee River have reduced connectivity between slenderclaw crayfish populations by altering some of the habitat from a flowing stream to standing, impounded water. The Town Creek and Short Creek watersheds, each containing one of the two extant populations of the slenderclaw crayfish, drain into Guntersville Lake, a Tennessee Valley Authority reservoir constructed in 1939, on the Tennessee River. Despite survey efforts, no slenderclaw crayfish has been found in Guntersville Lake, and to date, the slenderclaw crayfish has not been documented in any impounded areas. Guntersville Lake likely poses a barrier between the two slenderclaw crayfish populations and prevents the exchange of genetic material (Schuster 2017, unpublished data). It should be noted that slenderclaw crayfish was first collected in 1970 (approximately 31 years after the completion of Guntersville Lake), and, therefore, the range of the slenderclaw crayfish prior to Guntersville Lake's creation is unknown, and the impacts of the lake's creation on the slenderclaw crayfish during that time are unknown.

Streams on Sand Mountain, which include streams in Short and Town Creek watersheds, are prone to seasonal low water conditions during the fall and early winter months before the winter wet season (USGS 2017, unpaginated), and the Pottsville aquifer is not a reliable source

of large amounts of groundwater for recharge of these streams (Kopaska-Merkel *et al.* 2008, p. 19). Therefore, these streams are vulnerable to changes in hydrology and water availability. In addition to the seasonal low water conditions, there is a high number of small impoundments on Sand Mountain (Holley 2017, pers. comm.) that further alter the hydrology and available surface water in these streams. In the future, if these streams have a further reduction in water availability due to hydrological alteration or natural variation, this could be a factor that negatively influences the viability of the slenderclaw crayfish.

Land Use

Within DeKalb and Marshall Counties, the amount of land area in farms (pastureland, poultry production, and row crop production) has decreased over time (Bearden *et al.* 2017, p. 27). Prior to the discovery of the slenderclaw crayfish, DeKalb and Marshall Counties' total acreage in farms in 1969 was 60 percent (299,316 acres (ac) (121,128 hectares (ha))) and 51 percent (205,105 ac (83,003 ha)), respectively, which included pastureland, poultry production, and row crop production (USDA 1972, p. 285). By 2012, the total acreage in farms had decreased to 46 percent (229,294 ac (92,792 ha)) and 41 percent (162,980 ac (65,956 ha)) in DeKalb and Marshall Counties, respectively (USDA 2014, pp. 230, 234). However, although the amount of area in farm land has decreased since 1969, water quality is still impacted by agricultural practices, as discussed above (Bearden *et al.* 2017, p. 18). In the future, land use is not expected to change drastically; however, a change from agriculture and poultry farming to urban uses could potentially impact the slenderclaw crayfish. The expansion of urban areas could reduce available habitat for the slenderclaw crayfish, as well as increase impervious surfaces and resultant runoff, which can reduce water quality.

Low Abundance and Scientific Collection

The current estimated low abundance (n=32), scientific collection, and genetic drift may negatively affect populations of the slenderclaw crayfish. In general, the fewer populations a species has or the smaller its population size, the greater the likelihood of extinction by chance alone (Shaffer and Stein 2000, p. 307). Genetic drift occurs in all species, but is more likely to negatively affect populations that have a smaller effective population size (Caughley 1994, pp. 219–220; Huey *et al.* 2013, p. 10). There are only two populations of the slenderclaw crayfish with limited connectivity between those populations, which may have reduced genetic diversity. However, no testing for genetic drift has been conducted for the slenderclaw crayfish.

Due to its small size, slenderclaw crayfish are difficult to identify in the field during surveys. Therefore, experts have historically collected individuals for later identification, resulting in removal of individuals from the populations. These vouchered specimens are important for identification and documentation purposes; however, if collection is removing breeding adults from the population, then it could make the overall population unsustainable as individual populations may decline. With the current estimated low number of individuals (n=32), as evidenced by low capture rates, collection, and particularly repeated collection (for example, in multiple subsequent years), could further deplete the number of breeding adults.

Synergistic Effects

In addition to impacting the species individually, it is likely that several of the above summarized risk factors are acting synergistically or additively on the species. The combined impact of multiple stressors is likely more harmful than a single stressor acting alone. For example, in the Town Creek watershed, Town Creek was previously listed as an impaired stream due to ammonia and organic enrichment/dissolved oxygen impairments, and recent surveys documented eutrophic conditions of elevated nutrients and low dissolved oxygen. In addition,

hydrologic variation and alteration has occurred within the Town Creek watershed. Low water conditions naturally occur in streams where the slenderclaw crayfish occurs, and alteration causing prolonged low water periods could have a negative impact on the reproductive success of the slenderclaw crayfish. Further, connectivity between Town Creek and Short Creek watersheds is likely low due to Guntersville Lake. The combination of all of these stressors on the sensitive aquatic species in this habitat has probably impacted slenderclaw crayfish, in that only four individuals have been recorded here since 2009.

Conservation Actions

TMDLs have been developed in Scarham Creek for siltation, ammonia, pathogens, organic enrichment/low dissolved oxygen, and pesticides (ADEM 2002, p. 5). Town Creek is currently on the 303(d) list for mercury contamination due to atmospheric deposition (ADEM 2016a, appendix C). However, a TMDL for organic enrichment/dissolved oxygen has been developed for Town Creek (ADEM 1996, entire). Through the 303(d) program, ADEM provides section 319 funding targeting the watersheds to improve water quality. In 2014, the Upper Scarham Creek Watershed was selected as a priority by ADEM for the development of a watershed management plan. In Fiscal Year 2016, the DeKalb County Soil and Water Conservation District contracted with ADEM to implement the Upper Scarham Creek Watershed Project using section 319 funding (ADEM 2016b, p. 39).

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) National Water Quality Initiative program identified the Guntersville Lake/Upper Scarham Creek in DeKalb County as an Alabama Priority Watershed in 2015 (NRCS 2017, unpaginated). This watershed is within the historical range of the slenderclaw crayfish. It is recognized as in need of conservation practices, as it was listed on the Alabama 303(d) list as impaired due to

organic enrichment/low dissolved oxygen and ammonia as nitrogen (ADEM 2002, p. 4). The National Water Quality Initiative helps farmers, ranchers, and forest landowners improve water quality and aquatic habitats in impaired streams through conservation and management practices. Such practices include controlling and trapping nutrient and manure runoff, and installation of cover crops, filter strips, and terraces.

Future Scenarios

For the purpose of this assessment, we define viability as the ability of the species to sustain populations in the wild over time. To help address uncertainty associated with the degree and extent of potential future stressors and their impacts on the needs of the species, the concepts of resiliency, redundancy, and representation were applied using three plausible future scenarios. We devised these scenarios by identifying information on the following primary stressors that are anticipated to affect the species in the future: nonnative virile crayfish, hydrological variation (precipitation and water quantity), land-use change, and water quality.

Our three scenarios reflected differing levels of impacts on hydrological variation (precipitation change), land-use change, and nonnative virile crayfish spread. In the future, the virile crayfish will expand farther and is anticipated to occupy both the Short Creek and Town Creek watersheds where slenderclaw crayfish is known to occur. Water quality may improve on Sand Mountain; however, the presence of virile crayfish is expected to be a more powerful driver in the future condition of the slenderclaw crayfish. In addition, the effect of the other factors identified to be impacting the species is expected to reduce available habitat through time.

To understand how precipitation will change in the future and apply this to our future scenarios, we used the U.S. Geological Survey's National Climate Change Viewer (Alder and Hostetler 2013, entire) to predict change in precipitation through 2040. We used the Slope, Land

use, Excluded, Urban, Transportation and Hillshade (SLEUTH-3r) urban-growth model to explore potential land-use change and urbanization on Sand Mountain and the surrounding area through 2040 (Belyea and Terando 2013, entire; Terando et al. 2014, entire). Regarding spread of virile crayfish, there is uncertainty regarding the rate at which the virile crayfish is expected to expand, and it has been documented to spread at a rate of approximately 124 mi (200 km) over 15 years (3,609 ft per month (1,100 m per month)) (Williams 2018, pers. comm.; Williams *et al.* 2011, entire). However, we applied the approximate natural rate of spread (1,640 ft per month (500 m per month)) (Wong 2014, p. 4) to known virile crayfish locations to estimate virile crayfish occupation of known slenderclaw crayfish sites. Then, we projected how these stressors would change over time and developed future scenarios at three time periods: 2020, 2030, and 2040. Given the documented rate of virile crayfish spread of 124 mi (200 km) over 15 years (Williams 2018, pers. comm.) and that the virile crayfish was found at the type locality for the slenderclaw crayfish in 2015 (Schuster 2017, unpublished data), we chose a first time-step of 2020 to assess the earlier stages of virile crayfish spread, and we chose an ending time step of 2040 because we were reasonably certain we could forecast the virile crayfish's spread, as well as precipitation and land-use change, to this time period. However, the time period for our projections begins in 2017, as this was the end of our current condition timeframe. Brief descriptions of the three scenarios are below; for more detailed information on these scenarios and projections used to inform these scenarios, please see the SSA report (Service 2018, chapter 5).

In Scenario 1, we projected continuation of the current rate of seasonal low water events, continued impact from land-use on water quality, low level of urban sprawl, and continued rate of virile crayfish spread to 2040. Current impacts to the landscape due to farming practices are

expected to continue as evident in the water quality conditions, and low water events during the late summer to winter season will also continue. We expect the virile crayfish to spread farther into the Short Creek population, specifically into the currently occupied Shoal Creek sites, and to occupy the Town Creek population and its known slenderclaw crayfish sites. This Shoal Creek site is currently considered the most abundant slenderclaw crayfish location (n=26) (Schuster 2017, unpublished data; Bearden *et al.* 2017, p. 17); we expect that abundance of this population will be reduced, and the population will be in low to extirpated condition by 2040. We expect that by 2040, the Short Creek population of the slenderclaw crayfish will be extirpated and all currently known sites will be occupied by the virile crayfish. By 2040, in the Town Creek population, we expect that the virile crayfish will occupy the slenderclaw crayfish's sites on Bengis and Town creeks, but the slenderclaw crayfish will still be present, though in very low abundance.

In Scenario 2, we projected a continuation of the current rate of seasonal low water events, but with additional conservation measures to improve and protect water quality, a reduced level of urban sprawl, and a slower rate of virile crayfish spread to 2040. We projected that best management practices and conservation programs would improve conditions on farm land, and, therefore, water quality conditions gradually improve. Low water events during the late summer to winter season will continue, but will not become longer than the current average. Although this scenario projected a lower rate of spread than Scenario 1, the virile crayfish is still expected to spread farther into the Short Creek population and will occupy the lower reaches of the Town Creek mainstem in the Town Creek population by 2040. Despite improved water quality conditions for the slenderclaw crayfish and aquatic macroinvertebrates, we expect that

the presence of virile crayfish will still cause the extirpation of the slenderclaw crayfish in the Short Creek population, and keep the Town Creek population in low condition, by 2040.

In Scenario 3, we projected an increased frequency and extended rate of seasonal low water events, reduction in water quality from poor land management practices, a moderate to high rate of urban sprawl, and a faster rate of virile crayfish spread to 2040. We expect that poor land management practices will result in degraded water quality and negative impacts to the macroinvertebrate community. We expect that longer and more frequent low water events during the late summer to winter season will impact critical life stages of the slenderclaw crayfish. In addition, we projected virile crayfish to spread more rapidly than in the other two scenarios. With the faster rate of spread, we expect the virile crayfish to be present at all currently known locations of the slenderclaw crayfish in the Short Creek population by 2020, and this population extirpated by 2030. By the year 2040, we expect that the virile crayfish will occupy all currently known sites in the Town Creek slenderclaw crayfish population, and, therefore, we expect this population to be extirpated as well.

In summary, the resiliency of the Short Creek population is expected to remain low under Scenarios 1 and 2 in the year 2020, and the resiliency of the Town Creek population is expected to remain low under all three scenarios in the year 2020. By the year 2030, we expect the Short Creek population to become extirpated under Scenario 1 and under Scenario 3. By 2030, we expect the resiliency of the Town Creek population to remain low under Scenarios 1 and 2 and to be reduced to very low condition under Scenario 3. By the year 2040, we expect the Short Creek population to become extirpated under all three scenarios, and the Town Creek population to become extirpated under Scenario 3, remain in low resiliency under Scenario 2, and reduced to very low resiliency under Scenario 1.

We evaluated future representation by assessing the habitat variability and morphological variation of the slenderclaw crayfish. With the expected extirpation of the Short Creek population under all of the above scenarios by 2040, we expect habitat variability to be lost to the slenderclaw crayfish. The Short Creek population occurs in the large boulder, wider stream habitat type, and, therefore, this population is adapted to this habitat type, which is expected to be lost, as well as the morphological variation of the species encountered in the Short Creek population. Thus, representation will be further reduced.

We anticipate a reduction in the occupied range of the species (redundancy) through the loss of the Short Creek population, and, at a minimum, the species' range within the Town Creek population will be highly restricted to the headwaters due to the expansion of virile crayfish. Therefore, the slenderclaw crayfish is expected to have very limited redundancy in the future. The recolonization of sites (or one of the populations) following a catastrophic event would be very difficult given the loss of additional sites (and one or both populations) and reduced habitat available to the remaining population.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the slenderclaw crayfish. The Act defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species that "is likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

We considered whether the slenderclaw crayfish is presently in danger of extinction and determined that proposing endangered status is not appropriate. Our review of the best available information indicates that there are currently two populations of slenderclaw crayfish occurring

across the species' historical range in Alabama. Although there is some evidence of reduced abundance and presumed extirpation at four historical sites, the species has also been identified at three new sites as reflected by recent increased survey efforts. In addition, the best available information does not suggest that this species occurred in much greater numbers than it does today. While there are potentially several sources of indirect water quality impacts, no direct water quality-related impacts to the slenderclaw crayfish are known at this time, and crayfish generally have a higher tolerance to poor water quality conditions compared to other aquatic species such as mussels. However, water quality was identified as a potential factor that may indirectly affect the viability of the slenderclaw crayfish. Currently, the primary threat to the slenderclaw crayfish is the nonnative virile crayfish, which is expanding into the slenderclaw crayfish's range. At present, the virile crayfish has been reported as occurring at only one site, the type locality, where the slenderclaw crayfish was known to occur. The slenderclaw crayfish no longer occurs at this site, but we do not know whether the virile crayfish is the cause. At this time, the virile crayfish occupies a few sites approximately 7 mi (11 km) downstream of current slenderclaw crayfish sites in one (Short Creek) of the two watersheds. There are currently no records of the virile crayfish in the Town Creek population. Therefore, we expect the slenderclaw crayfish to continue to persist in this watershed, as long as the virile crayfish does not expand its range. In addition, given that the species occurs in two different watersheds, a single catastrophic event (*e.g.*, a chemical spill) is not likely to impact both populations at the same time. Therefore, we determine that the slenderclaw crayfish is not currently in danger of extinction throughout all of its range.

However, we expect that resiliency, redundancy, and representation for the slenderclaw crayfish will be reduced from its current condition. The nonnative virile crayfish is the primary

threat to the slenderclaw crayfish in the foreseeable future. The term foreseeable future extends only so far as the Services can reasonably rely on predictions about the future in making determinations about the future conservation status of the species. Those predictions can be in the form of extrapolation of population or threat trends, analysis of how threats will affect the status of the species, or assessment of future events that will have a significant new impact on the species. The foreseeable future described here, uses the best available data and takes into account considerations such as the species' life history characteristics, threat projection timeframes, and environmental variability, which may affect the reliability of projections. We also considered the time frames applicable to the relevant threats and to the species' likely responses to those threats in view of its life history characteristics. The foreseeable future for a particular status determination extends only so far as predictions about the future are reliable.

In cases where the available data allow for projections, the time horizon for such analyses does not necessarily dictate what constitutes the "foreseeable future" or set the specific threshold for determining when a species may be in danger of extinction. Rather, the foreseeable future can only extend as far as the Service can reasonably explain reliance on the available data to formulate a reliable prediction and avoid reliance on assumption, speculation, or preconception. Regardless of the type of data available underlying the Service's analysis, the key to any analysis is a clear articulation of the facts, the rationale, and conclusions regarding foreseeability.

We determined the foreseeable future for the slenderclaw crayfish to be 10 to 20 years from present. The SSA's future scenarios modeled and projected both precipitation and land-use change, and the threat and rate of the virile crayfish's expansion, out to 2040, and we determined that we can rely on the range of 10 to 20 years as presented in the scenarios and predict how those threats will affect the slenderclaw crayfish within that time range. Given the projected rate

of virile crayfish spread of 1,640 ft per month (500 m per month) (Wong 2014, p. 4) and documented behavior and current locations of the virile crayfish, we can reliably predict within the next 10 to 20 years that the virile crayfish will expand further into the slenderclaw crayfish's range and likely outcompete the slenderclaw crayfish. In addition, 10 to 20 years represents 10 to 20 generations, which would allow population-level impacts from threats to be detected.

There is uncertainty regarding the rate at which virile crayfish may extend into the range of the slenderclaw crayfish and the effects on slenderclaw crayfish populations should the virile crayfish become established. We acknowledge this uncertainty, and we are specifically seeking additional information from the public to better inform our final determination (see **Information Requested**, above). However, based on the documented past expansion of the virile crayfish, future invasion and expansion into the slenderclaw crayfish's range is expected to occur within the foreseeable future. As discussed above and based on the scenarios, we expect the Short Creek population to be extirpated and the Town Creek population to have lower resiliency or become extirpated within the foreseeable future. We expect the remaining population of the slenderclaw crayfish to become more vulnerable to extirpation, as evidenced by concurrent losses in representation and redundancy. Primarily due to this nonnative species invasion reducing or extirpating most, if not all, of the sites and both populations, we expect the species to be in danger of extinction in the foreseeable future. Accordingly, we find that the slenderclaw crayfish is likely to become in danger of extinction within the foreseeable future throughout its range.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that the slenderclaw crayfish is likely to become an endangered species within the

foreseeable future throughout its range, we find it unnecessary to proceed to an evaluation of potentially significant portions of the range. Where the best available information allows the Services to determine a status for the species rangewide, that determination should be given conclusive weight because a rangewide determination of status more accurately reflects the species' degree of imperilment and better promotes the purposes of the statute. Under this reading, we should first consider whether listing is appropriate based on a rangewide analysis and proceed to conduct a "significant portion of its range" analysis if, and only if, a species does not qualify for listing as either endangered or threatened according to the "all" language. We note that the court in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), did not address this issue, and our conclusion is therefore consistent with the opinion in that case.

Therefore, on the basis of the best available scientific and commercial information, we propose to list the slenderclaw crayfish as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

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. 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.

Subsection 4(f) of the Act requires 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 includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. 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 (such as "downlisting" from endangered to threatened) or removal from the Federal Lists of Endangered and Threatened Wildlife and Plants ("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 we list the slenderclaw crayfish, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Alabama would be eligible for Federal funds to implement management actions that promote the protection or recovery of the slenderclaw crayfish. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Although the slenderclaw crayfish 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**).

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

Background

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to threatened wildlife. Under section 4(d) of the Act, the Service has discretion to issue regulations that we find necessary and advisable to provide for the conservation of threatened species. The Secretary also has the discretion to prohibit, by regulation with respect to any threatened species of fish or wildlife, any act prohibited under section 9(a)(1) of the Act. The same prohibitions of section 9(a)(1) of the Act, as applied to threatened wildlife and codified at 50 CFR 17.31, make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) threatened wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally.

In accordance with section 4(d) of the Act, the regulations implementing the Act include a provision that generally applies to threatened wildlife the same prohibitions that apply to endangered wildlife (50 CFR 17.31(a)). However, for any threatened species, the Service may instead develop a protective regulation that is specific to the conservation needs of that species. Such a regulation would contain all of the protections applicable to that species (50 CFR 17.31(c)); this may include some of the general prohibitions and exceptions under 50 CFR 17.31 and 17.32, but would also include species-specific protections that may be more or less restrictive than the general provisions at 50 CFR 17.31.

For the slenderclaw crayfish, the Service has developed a proposed 4(d) rule that is tailored to the specific threats and conservation needs of this species. The proposed 4(d) rule will not remove or alter in any way the consultation requirements under section 7 of the Act.

Proposed 4(d) Rule for Slenderclaw Crayfish

Under this proposed 4(d) rule, the following prohibitions apply to the slenderclaw crayfish except as otherwise noted:

Take

Protecting the slenderclaw crayfish 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 species. Therefore, we propose to prohibit intentional take of slenderclaw crayfish, including, but not limited to, capturing, handling, trapping, collecting, or other activities. In addition, we propose to prohibit the import, export, possession, sale, offer for sale, delivery, carry, transport, or shipment, by any means whatsoever, any slenderclaw crayfish.

Protecting the slenderclaw crayfish from indirect forms of take, such as harm that results from habitat degradation, will likewise help preserve the species' populations and also decrease negative effects from other stressors impeding recovery of the species. We determined that the primary threat to the slenderclaw crayfish is the nonnative virile crayfish, which is expanding farther into the slenderclaw crayfish's range. Therefore, any intentional or incidental introduction of nonnative species, such as the virile crayfish, that compete with, prey upon, or destroy the habitat of the slenderclaw crayfish would further impact the species and its habitat. Also, destruction or 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, will impact the habitat for the slenderclaw

crayfish, and therefore potentially harm the slenderclaw crayfish. In addition, a further reduction in streamwater availability due to hydrological alteration from modification of water flow of any stream in which the slenderclaw crayfish is known to occur could harm the crayfish as it resides in flowing streams, not impounded waters. Finally, water quality impacts have been documented to occur in both watersheds in which the slenderclaw crayfish occurs, and any discharge of chemicals or fill material into these watersheds will further impact the habitat of the slenderclaw crayfish. Therefore, we propose to prohibit actions that result in the incidental take of slenderclaw crayfish by altering or degrading the habitat.

Exceptions from Prohibitions

The proposed 4(d) rule includes the following exceptions from the above-stated prohibitions:

Permitted Activities

We may issue permits to carry out otherwise prohibited activities, including those described above, involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act. 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 may allow take of the slenderclaw crayfish 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. In addition, Federal and State law enforcement officers may possess, deliver, carry, transport, or ship slenderclaw crayfish taken in violation of the Act as necessary.

Streambank Stabilization

Streambank stabilization is used as a habitat restoration technique to restore degraded and eroded streambanks back to vegetated, stable streambanks. When done correctly, these projects reduce bank erosion and instream sedimentation, resulting in improved habitat conditions for aquatic species. However, given the slenderclaw crayfish's current low abundance, any take from streambank stabilization projects using equipment instream would be harmful to the 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), or brush layering (cuttings or branches of easily rooted tree species layered between successive lifts of soil fill). 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. In addition, to reduce streambank erosion and sedimentation into the stream, we would require that work using these bioengineering methods would be performed at base-flow or low water conditions and when significant rainfall is not predicted. Further, streambank stabilization projects must keep all equipment out of the stream channels and water.

This provision of the proposed 4(d) rule for streambank stabilization would promote conservation of the slenderclaw crayfish by excepting from prohibitions activities that would improve habitat conditions by reducing bank erosion and instream sedimentation.

Finding

The terms "conserve", "conserving", and "conservation" as defined by the Act, mean to use and 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 this Act are no longer necessary. Due to threats acting on the slenderclaw crayfish and the projected impacts to the species and its habitat in the foreseeable future, its viability is expected to decline. The encroachment of the virile crayfish along with reduced water quality leave the species vulnerable to becoming in danger of extinction within the foreseeable future. The species has historically continued to persist in two populations despite its narrow endemic nature; however, the viability is expected to decline due to the virile crayfish and the conditions of the habitat. Prohibiting intentional take as described above as well as incidental take by altering or degrading the habitat will be beneficial in order to protect the slenderclaw crayfish from activities that negatively affect the species and further exacerbate population declines.

For the reasons discussed above, we find that this rule under section 4(d) of the Act is necessary and advisable to provide for the conservation of the slenderclaw crayfish. We do, however, seek public comment on whether there are additional activities that should be considered under the 4(d) provision for the slenderclaw crayfish (see **Information Requested**, above). This proposal will not be made final until we have reviewed comments from the public and peer reviewers.

III. Proposed Critical Habitat Designation

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. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to 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 within an area, we focus on the specific features that 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. We will determine whether unoccupied areas are essential for the conservation of the species by considering the life-history, status, and conservation needs of the species. This will be further informed by any generalized conservation strategy, criteria, or outline that may have been developed for the species to provide a substantive foundation for identifying which features and specific areas are essential to the conservation of the species and, as a result, the development of the critical habitat designation. For example, an area currently occupied by the species but that was not occupied at the time of listing may be essential to the conservation of the species and may be included in the critical habitat designation.

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, 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 the Secretary shall designate critical habitat at the time the species is determined to be an endangered or threatened species to the maximum extent prudent and determinable. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following situations exist:

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

(2) Such designation of critical habitat would not be beneficial to the species. In determining whether a designation would not be beneficial, the factors the Service may consider include, but are not limited to, whether the present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or whether any areas meet the definition of "critical habitat."

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 the absence of finding that the designation of critical habitat would increase threats to a species, we next determine whether such designation of critical habitat would not be beneficial to the species. In the information provided above on threats to the species, we determined that there are habitat-based threats to the slenderclaw crayfish identified under Factor A; therefore, we cannot say that the designation of critical habitat would not be beneficial to the species. Rather, we determine that critical habitat would

be beneficial to the species through the application of section 7 of the Act to actions that affect habitat as well as those that affect the species.

Because we have determined that the designation of critical habitat will not likely increase the degree of threat to the species and would be beneficial, we find that designation of critical habitat is prudent for the slenderclaw crayfish.

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 slenderclaw crayfish 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."

We reviewed the available information pertaining to the biological needs of the species and habitat characteristics where the species is located. We find that this information is sufficient for us to conduct both the biological and economic analyses required for the critical habitat determination. Therefore, we conclude that the designation of critical habitat is determinable for the slenderclaw crayfish.

Physical or Biological Features

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features that are essential to the conservation of the species and which may require special management

considerations or protection. These include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic needed to support the life history of the species. In considering whether features are essential to the conservation of the species, the Service 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.

We derive the specific physical or biological features essential for slenderclaw crayfish from studies of this species' and similar crayfish species' habitat, ecology, and life history. The primary habitat elements that influence resiliency of the slenderclaw crayfish include water quantity, water quality, substrate, interstitial space, and habitat connectivity. More detail of the habitat and resource needs are summarized above under *Habitat*. We use the ADEM water quality standards for fish and wildlife criteria to determine the minimum standards of water quality necessary for the slenderclaw crayfish. A full description of the needs of individuals, populations, and the species is available from the SSA report; the resource needs of individuals are summarized below in Table 1.

Table 1. Resource Needs for Slenderclaw Crayfish to Complete each Life Stage.

Life Stage	Resources Needed
Fertilized Eggs	• Female to carry eggs • Water to oxygenate eggs • Female to fan eggs to prevent sediment buildup and oxygenate water as needed • Female to shelter in boulder/cobble substrate and available interstitial space
Juveniles	• Female to carry juveniles in early stage • Water • Food (likely aquatic macroinvertebrates) • Boulder/cobble substrate and available interstitial space for shelter
Adults	• Water • Food (likely omnivorous, opportunistic, and generalist feeders) • Boulder/cobble substrate and available interstitial space for shelter

Summary of Essential Physical or Biological Features

In summary, we derive the specific physical or biological features essential to the conservation of the slenderclaw crayfish from studies of this species' and similar crayfish species' habitat, ecology, and life history, as described above. Additional information can be found in the SSA report (Service 2018, entire) available on *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069. We have determined that the following physical or biological features are essential to the conservation of the slenderclaw crayfish:

(1) Geomorphically stable, small to medium, flowing streams:

(a) That are typically 19.8 feet (ft) (6 meters (m)) wide or smaller;

(b) With attributes ranging from:

(i) Streams with predominantly large boulders and fractured bedrock, with widths from 16.4 to 19.7 ft (5 to 6 m), low to no turbidity, and depths up to 2.3 ft (0.7 m), to

(ii) Streams dominated by small substrate types with a mix of cobble, gravel, and sand, with widths of approximately 9.8 feet (3 m), low to no turbidity, and depths up to 0.5 feet (0.15 m);

(c) With substrate consisting of boulder and cobble containing abundant interstitial spaces for sheltering and breeding; and

(d) With intact riparian cover to maintain stream morphology and to reduce erosion and sediment inputs.

(2) Seasonal water flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the crayfish's habitat and food availability.

(3) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; and minimal levels of 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.

(4) Prey base of aquatic macroinvertebrates and detritus. Prey items may include, but are not limited to, insect larvae, snails and their eggs, fish and their eggs, and plant and animal detritus.

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 slenderclaw crayfish may require special management considerations or protections to reduce the following threats: (1) Impacts from invasive species, including the nonnative virile crayfish; (2) nutrient pollution from agricultural activities that impact water quantity and quality; (3) significant alteration of water quality and water quantity, including conversion of streams to impounded areas; (4) culvert and pipe installation that creates barriers to movement; and (5) other watershed and floodplain disturbances that release sediments or nutrients into the water.

Management activities that could ameliorate these threats include, but are not limited to: Control and removal of introduced invasive species; limiting the spreading of poultry litter to time periods of dry, stable weather conditions; use of best management practices designed to reduce sedimentation, erosion, and bank side destruction; protection of riparian corridors and retention of sufficient canopy cover along banks; moderation of surface and ground water withdrawals to maintain natural flow regimes; 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.

The current distribution of the slenderclaw crayfish is much reduced from its historical distribution in one (Short Creek watershed) of the two populations. The currently occupied sites

in the Short Creek watershed occur in a single tributary (Shoal Creek), and one catastrophic event could impact this entire population. In addition, the nonnative virile crayfish occupies sites within the Short Creek watershed, including the type locality for the slenderclaw crayfish in Short Creek in which the slenderclaw crayfish no longer occurs. We anticipate that recovery will require continued protection of existing populations and habitat, as well as establishing sites in additional streams that more closely approximate its historical distribution in order to ensure there are adequate numbers of crayfish in stable populations and that these populations have multiple sites occurring in at least two streams within each watershed. This will help ensure that catastrophic events, such as a chemical spill, cannot simultaneously affect all known populations.

Sources of data for this proposed critical habitat designation include numerous survey reports on streams throughout the species' range and databases maintained by crayfish experts and universities (Bouchard and Hobbs 1976, entire; Bearden 2017, unpublished data; Schuster 2017, unpublished data; Taylor 2017, unpublished data; Service 2018, entire). We have also reviewed available information that pertains to the habitat requirements of this species. Sources of information on habitat requirements include surveys conducted at occupied sites and published in agency reports, and data collected during monitoring efforts.

Areas Occupied at the Time of Listing

For locations within the geographic area occupied by the species at the time of listing, we identified stream channels that currently support populations of the slenderclaw crayfish. We defined "current" as stream channels with observations of the species from 2009 to the present. Due to the recent breadth and intensity of survey efforts for the slenderclaw crayfish throughout the historical range of the species, it is reasonable to assume that streams with no positive

surveys since 2009 should not be considered occupied for the purpose of our analysis. Within these areas, we delineated critical habitat unit boundaries using the following process:

We evaluated habitat suitability of stream 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 species. We refined the starting and ending points of units by evaluating the presence or absence of appropriate physical and biological features. We selected the headwaters as upstream cutoff points for each stream and downstream cutoff points that omit areas that are not suitable habitat. For example, the Guntersville Lake Tennessee Valley Authority project boundary was selected as an endpoint for one unit, as there was a change to unsuitable parameters (*e.g.*, impounded waters).

Based on this analysis, the following streams meet criteria for areas occupied by the species at the time of listing: Bengis Creek, Scarham Creek, Shoal Creek, Short Creek, Town Creek, and Whippoorwill Creek (see *Unit Descriptions*, below). The proposed critical habitat designation does not include all stream segments known to have been occupied by the species historically; rather, it includes only the occupied stream segments within the historical range that have also retained one or more of the physical or biological features that will allow for the maintenance and expansion of existing populations.

Areas Outside the Geographical Area Occupied at the Time of Listing

To consider for designation areas not occupied by the species at the time of listing, we must demonstrate that these areas are essential for the conservation of the species. To determine if these areas are essential for the conservation of the slenderclaw crayfish, we considered the life history, status, and conservation needs of the species such as: (1) The importance of the stream to

the overall status of the species, the importance of the stream to the prevention of extinction, and the stream's contribution to future recovery of the slenderclaw crayfish; (2) whether the area could be maintained or restored to contain the necessary habitat to support the slenderclaw crayfish; (3) whether the site provides connectivity between occupied sites for genetic exchange; (4) whether a population of the species could be reestablished in the location; and (5) whether the virile crayfish is currently present in the stream.

For areas outside the geographical area occupied by the species at the time of listing, we delineated critical habitat unit boundaries by evaluating stream segments not known to have been occupied at listing (*i.e.*, outside of the geographical area occupied by the species) but that are within the historical range of the species to determine if they are essential for the survival and recovery of the species. Essential areas are those that:

(a) Expand the geographical distribution within areas not occupied at the time of listing across the historical range of the species; and

(b) Are connected to other occupied areas, which will enhance genetic exchange between populations.

General Information on the Maps of the Proposed Critical Habitat Designation

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 slenderclaw crayfish. 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 under the Act 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.

The proposed 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 proposed critical habitat designation in the discussion of individual units below. 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* under Docket No. FWS–R4–ES–2018–0069, and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT**, above).

Proposed Critical Habitat Designation

We are proposing to designate approximately 78 river miles (mi) (126 river kilometers (km)) in two units as critical habitat for the slenderclaw crayfish. These proposed critical habitat areas, described below, constitute our current best assessment of areas that meet the definition of critical habitat for the slenderclaw crayfish. The two units proposed as critical habitat are: (1) Town Creek Unit, and (2) Short Creek Unit. Unit 2 is subdivided into two subunits: (2a) Shoal Creek and Short Creek subunit, and (2b) Scarham-Laurel Creek subunit. Table 2 shows the name, occupancy of the unit, land ownership of the riparian areas surrounding the units, and approximate river miles of the proposed designated units for the slenderclaw crayfish.

Table 2. Proposed Critical Habitat Units for the Slenderclaw Crayfish.

Stream(s)	**Occupied at the Time of Listing**	**Ownership**	**Length of Unit in River Miles (Kilometers)**

Unit 1—Town Creek			
Bengis and Town creeks	Yes	Private	42 (67)
Unit 2—Short Creek			
Subunit 2a—Shoal Creek and Short Creek			
Scarham, Shoal, Short, and Whippoorwill creeks	Yes	Private	10 (17)
Subunit 2b—Scarham-Laurel Creek			
Scarham-Laurel Creek	No	Private	26 (42)
Total			78 (126)

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all proposed units, and reasons why they meet the definition of critical habitat for the slenderclaw crayfish, below.

Unit 1: Town Creek

Unit 1 consists of 41.8 river mi (67.2 river km) of Bengis and Town creeks in DeKalb County, Alabama. Unit 1 includes stream habitat up to bank full height, consisting of the headwaters of Bengis Creek to its confluence with Town Creek and upstream to the headwaters of Town Creek. Stream channels in and lands adjacent to Unit 1 are privately owned except for bridge crossings and road easements, which are owned by the State and County. The slenderclaw crayfish occupies all stream reaches in this unit, and the unit currently supports all breeding, feeding, and sheltering needs essential to the conservation of the slenderclaw crayfish.

Special management considerations or protection may be required for control and removal of introduced invasive species, including the nonnative virile crayfish, which occupies the boulder and cobble habitats and interstitial spaces within these habitats that the slenderclaw crayfish needs. At present, the virile crayfish is not present in this unit, although it has been documented just outside the watershed boundary. However, based on future projections in the

SSA report, the virile crayfish is expected to be present in the Town Creek watershed within the next 2 years.

In addition, special management considerations or protection may be required to address water withdrawals and drought as well as excess nutrients, sediment, and pollutants that enter the streams and serve as indicators of other forms of pollution, such as bacteria and toxins. A primary source of these types of pollution is agricultural runoff. However, during recent survey efforts for the slenderclaw crayfish, water quality analysis found lead measurements in Bengis Creek that exceeded the acute and chronic aquatic life criteria set by U.S. Environmental Protection Agency and ADEM, and elevated ammonia concentrations in Town Creek. Special management or protection may include moderating surface and ground water withdrawals, using best management practices to reduce sedimentation, and reducing watershed and floodplain disturbances that release pollutants and nutrients into the water.

Unit 2: Short Creek

Subunit 2a – Shoal Creek and Short Creek: Subunit 2a consists of 10.3 river mi (16.6 river km) of Scarham, Shoal, Short, and Whippoorwill creeks in DeKalb and Marshall Counties, Alabama. Subunit 2a includes stream habitat up to bank full height, consisting of the headwaters of Shoal Creek to its confluence with Whippoorwill Creek, Whippoorwill Creek to its confluence with Scarham Creek, Scarham Creek to its confluence with Short Creek, and Short Creek downstream to the Guntersville Lake Tennessee Valley Authority project boundary. Stream channels in and lands adjacent to subunit 2a are privately owned except for bridge crossings and road easements, which are owned by the State and Counties. The slenderclaw crayfish occupies all stream reaches in this unit, and the unit currently supports all breeding, feeding, and sheltering needs essential to the conservation of the slenderclaw crayfish.

Special management considerations or protection may be required for control and removal of introduced invasive species, including the virile crayfish (see Unit 1 discussion, above). At present, the virile crayfish is present at sites in Short Creek and Drum Creek within the Short Creek watershed and just outside of the unit boundary in Guntersville Lake. Based on future projections in the SSA report, the virile crayfish is expected to be present in more tributaries within the Short Creek watershed within the next 2 to 5 years.

In addition, special management considerations or protection may be required to address water withdrawals and drought as well as excess nutrients, sediment, and pollutants that enter the streams and serve as indicators of other forms of pollution such as bacteria and toxins. A primary source of these types of pollution is agricultural runoff. During recent survey efforts for the slenderclaw crayfish, water quality analysis indicated that impaired water quality due to nutrients, bacteria, and levels of atrazine may be of concern in the Short Creek watershed. Special management or protection may include moderating surface and ground water withdrawals, using best management practices to reduce sedimentation, and reducing watershed and floodplain disturbances that release pollutants and nutrients into the water.

Subunit 2b – Scarham-Laurel Creek: Subunit 2b consists of 25.9 river mi (41.7 river km) of Scarham-Laurel Creek in DeKalb and Marshall Counties, Alabama. Subunit 2b includes stream habitat up to bank full height, consisting of the headwaters of Scarham-Laurel Creek to its confluence with Short Creek. Stream channels in and lands adjacent to Subunit 2b are privately owned except for bridge crossings and road easements, which are owned by the State and Counties.

This unoccupied subunit is considered to be essential for the conservation of the species. Scarham-Laurel Creek is within the historical range of the slenderclaw crayfish but is not within

the geographical range currently occupied by the species at the time of listing. The slenderclaw crayfish has not been documented at sites in Scarham-Laurel Creek in over 40 years. We presume these sites to be extirpated. Scarham-Laurel Creek is in restorable condition and is currently devoid of the virile crayfish. Water quality concerns have been documented within Scarham-Laurel Creek, with it listed on Alabama's 303(d) list of impaired waters for impacts from pesticides, siltation, ammonia, low dissolved oxygen/organic enrichment, and pathogens from agricultural sources in 1998 (ADEM 1996, p. 1). However, in 2004, Scarham Creek was removed from the 303(d) list after TMDLs were established (ADEM 2002, p. 5). Recent water quality analysis indicated that water quality was impaired within the Short Creek watershed in which Scarham-Laurel Creek is located (Bearden *et al*. 2017, p. 32). However, when the water quality of Scarham-Laurel Creek is restored, the stream could be an area for population expansion within the Short Creek watershed, and thereby provide redundancy needed to support the species' recovery. Therefore, we conclude that this stream is essential for the conservation of the slenderclaw crayfish.

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 lands with a completed INRMP within the proposed critical habitat designation.

Exclusions

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

Section 4(b)(2) of the Act states that the Secretary shall designate 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 that determination, 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.

As discussed below, we are not proposing to exclude any areas from critical habitat. However, 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 obtained during the 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 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 whether a specific critical habitat designation may restrict or modify such 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. 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 socioeconomic 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 proposed designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the slenderclaw crayfish (IEc 2018, entire). The purpose of the screening analysis is to filter out the geographic

areas in which the critical habitat designation is unlikely to result in probable 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 species. The screening analysis filters out particular areas of critical habitat that would be subject to such protections and are, therefore, unlikely to incur incremental economic impacts. Ultimately, the screening analysis allows us to focus our analysis on 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, constitutes our draft economic analysis of the proposed critical habitat designation for the slenderclaw crayfish, and 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 proposed critical habitat designation. In our June 6, 2018, IEM, we first identified probable incremental economic impacts associated with each of the following categories of activities: (1) Agriculture and poultry farming; (2) development; (3) recreation; (4) restoration activities; (5) flood control; and (6) transportation and utilities. Additionally, we

considered whether their 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. If we list the species, as proposed in this document, in areas where the slenderclaw crayfish is present, under section 7 of the Act, Federal agencies would be required to consult with the Service on activities they fund, permit, or implement that may affect the species. If we finalize this proposed critical habitat designation, consultations to avoid the destruction or adverse modification of critical habitat would be incorporated into the consultation process.

In our IEM, we attempted to clarify the distinction between the effects that would 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 slenderclaw crayfish's critical habitat. Because the designation of critical habitat is being 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 would 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 slenderclaw crayfish 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 slenderclaw crayfish totals approximately 78 river mi (126 river km), which includes both occupied and unoccupied streams. Within the occupied streams, any actions that may affect the species would likely also affect proposed critical habitat, and it is unlikely that any additional conservation efforts would be required to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the species. Within the unoccupied streams, the Service will consult with Federal agencies on any projects that occur within the watershed boundaries containing unoccupied critical habitat due to overlap with the ranges of other listed species such as Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), harperella (*Ptilimnium nodosum*), and green pitcher-plant (*Sarracenia oreophila*) in these areas. In addition, all of the watershed boundaries containing unoccupied habitat are within the range of the slenderclaw crayfish. Therefore, any section 7 consultation would consider effects to the slenderclaw crayfish, even in the absence of designated critical habitat. Thus, no incremental project modifications resulting solely from the presence of unoccupied critical habitat are anticipated. Therefore, the only additional costs that are expected in all of the proposed critical habitat designation are administrative costs, due to the fact that this additional analysis will require time and resources by both the Federal action agency and the Service. We anticipate a maximum of three informal section 7 consultations and five technical assistance efforts annually at a total incremental cost of less than $10,000 per year.

As we stated earlier, we are soliciting data and comments from the public on the draft economic analysis, as well as all aspects of this proposed rule and our required determinations.

See **ADDRESSES**, above, for information on where to send comments. We may revise the proposed rule or supporting documents to incorporate or address information we receive during the public comment period.

Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. As discussed above, we prepared an analysis of the probable economic impacts of the proposed critical habitat designation and related factors. The Secretary does not propose to exercise his discretion to exclude any areas from the final designation based on economic impacts.

Exclusions Based on National Security Impacts or Homeland Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense or Department of Homeland Security where a national security impact might exist. In preparing this proposal, we have determined that no lands within the proposed designation of critical habitat for slenderclaw crayfish are owned or managed by the Department of Defense or Department of Homeland Security, and, therefore, we anticipate no impact on national security. Consequently, the Secretary is not intending to exercise his discretion to exclude any areas from the final designation based on impacts on national security.

Exclusions Based on Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security. We consider a number of factors including whether there are permitted conservation plans covering the species in the area, such as habitat conservation plans, safe harbor agreements, or candidate conservation agreements with assurances, 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 habitat conservation plans or other management plans for the slenderclaw crayfish, and the proposed critical habitat does not include any tribal lands or trust resources. We anticipate no impact on tribal lands, partnerships, or habitat conservation plans from this proposed critical habitat designation. Accordingly, the Secretary does not intend to exercise his discretion to exclude any areas from the final designation based on other relevant impacts.

During the development of a final designation, we will consider any additional information we receive during the public comment period, including, but not limited to, economic impact information, which may result in areas being excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

Effects of Critical Habitat Designation

Section 7 Consultation

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)(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 regulation with a new definition of destruction or adverse modification on February 11, 2016 (81 FR 7214). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.

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 or that involve some other Federal action. Federal agency actions within the species' habitat that may require conference or consultation or both include management and any other landscape-altering activities on private lands seeking funding by Federal agencies, which may include, but are not limited to, the U.S. Department of Agriculture (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. Federal actions not affecting listed species or

critical habitat, and actions on State, tribal, local, or private lands that are not federally funded or authorized, do not require section 7 consultation.

As a result of section 7 consultation, we document compliance with the requirements of section 7(a)(2) 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" (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 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have newly listed a species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies sometimes may need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Application of the "Adverse Modification" Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that result in a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of the slenderclaw crayfish. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of the species or that preclude or significantly delay development of such features. 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 destroy or adversely modify such habitat, or that may be affected by such designation. Activities that may affect critical habitat, when carried out, funded, or authorized by a Federal agency, should result in consultation for the slenderclaw crayfish These activities include, but are not limited to:

(1) Actions that would alter the minimum flow or the existing flow regime. Such activities could include, but are not limited to, impoundment, channelization, water diversion, and water withdrawal. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the slenderclaw crayfish by decreasing or altering seasonal flows to levels that would adversely affect the species' 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 (including pharmaceuticals, metals, and salts) 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 slenderclaw crayfish and result in direct or cumulative adverse effects to these 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, timber harvest, off-road vehicle use, and other watershed and floodplain disturbances. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the slenderclaw crayfish by increasing the

sediment deposition to levels that would adversely affect the species' ability to complete its life cycle.

(4) Actions that would significantly increase eutrophic conditions. Such activities could include, but are not limited to, release of nutrients into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities can result in excessive nutrients and algae filling streams and reducing habitat for the slenderclaw crayfish, degrading water quality from excessive nutrients and during algae decay, and decreasing oxygen levels to levels below the tolerances of the slenderclaw crayfish.

(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 slenderclaw crayfish and its habitats. These actions can also lead to increased sedimentation and degradation in water quality to levels that are beyond the tolerances of the slenderclaw crayfish.

(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 slenderclaw crayfish. Possible actions could include, but are not limited to, stocking of nonnative crayfishes and fishes, stocking of sport fish, or other related actions. These activities can introduce parasites or disease; result in direct predation or direct competition; or affect the growth, reproduction, and survival of the slenderclaw crayfish.

IV. 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.

Executive Order 13771

This rule is not an 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.

Regulatory Planning and Review (Executive Orders 12866 and 13563)

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant rules. The Office of Information and Regulatory Affairs 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 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 if 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.

The Service's current understanding of the requirements under the RFA, as amended, and following recent court decisions, is that Federal agencies are only required to evaluate the potential incremental impacts of rulemaking 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 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

promulgated, 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 promulgated, 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.

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. In our economic analysis, we did not find that the designation of this proposed critical habitat will 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 findings:

(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 proposed rule would significantly or uniquely affect small governments because the lands within and adjacent to the streams being proposed for critical habitat designation are owned by private landowners. These government entities do not fit the definition of "small governmental jurisdiction." Therefore, 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 slenderclaw crayfish 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 and concludes that, if adopted, this designation of critical habitat for slenderclaw crayfish 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, the appropriate State resource agency in Alabama. 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 State, or on the relationship between the national government and the State, 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 to 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 these local governments in long-range planning (because these local governments 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) 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 does 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 proposed rule does not contain any new collections of information that require approval by the Office of Management and Budget under the Paperwork Reduction Act of 1995. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is 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 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 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 will be affected by this proposed rulemaking.

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 U.S. Fish and Wildlife Service Species Assessment Team and 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 "Crayfish, slenderclaw" to the List of Endangered and Threatened Wildlife in alphabetical order under CRUSTACEANS 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
* * * * * * *				
CRUSTACEANS				
* * * * * * *				
Crayfish, slenderclaw	*Cambarus cracens*	Wherever found	T	[*Federal Register* citation when published as a final rule] 50 CFR 17.46(b)[4d]; 50 CFR 17.95(h)[CH].

* * * * * * *

3. Amend § 17.46 by revising paragraph (b) to read as set forth below:

§17.46 Special rules—crustaceans.

* * * * *

(b) Slenderclaw crayfish (*Cambarus cracens*). --(1) *Prohibitions.* The following prohibitions apply to the slenderclaw crayfish:

(i) *Take*. Except as provided under paragraph (b)(2) of this section, it is unlawful to take the slenderclaw crayfish within the United States. Take includes:

(A) Intentional take of slenderclaw crayfish, including capture, handling, or other activities, and

(B) Actions that result in the incidental take of slenderclaw crayfish by altering or degrading the habitat.

(ii) *Possession and other acts with unlawfully taken slenderclaw crayfish*. It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any slenderclaw crayfish that was taken in violation of this section or State laws.

(iii) *Import and export*. It is unlawful to import or to export the slenderclaw crayfish. Any shipment in transit through the United States is an importation and an exportation, whether or not it has entered the country for customs purposes.

(iv) *Interstate or foreign commerce*. It is unlawful to deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, and in the course of a commercial activity, any slenderclaw crayfish.

(v) *Sale or offer for sale*. (A) It is unlawful to sell or to offer for sale in interstate or foreign commerce any slenderclaw crayfish.

(B) An advertisement for the sale of slenderclaw crayfish that carries a warning to the effect that no sale may be consummated until a permit has been obtained from the Service shall not be considered an offer for sale within the meaning of this section.

(2) *Exceptions from prohibitions.* The following exceptions from prohibitions apply to the slenderclaw crayfish:

(i) All of the provisions of §17.32 apply to the slenderclaw crayfish.

(ii) Any employee or agent of the Service or a State conservation agency, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take the slenderclaw crayfish without a permit if such action is necessary to:

(A) Aid a sick, injured or orphaned specimen;

(B) Dispose of a dead specimen; or

(C) Salvage a dead specimen which may be useful for scientific study.

(iii) Any take under paragraph (b)(2)(ii) of this section must be reported in writing to the U.S. Fish and Wildlife Service, Office of Law Enforcement, 5275 Leesburg Pike, Falls Church, VA 22041, within 5 days of the taking. The specimen may only be retained, disposed of, or salvaged under directions from the Office of Law Enforcement.

(iv) Streambank stabilization projects that replace pre-existing bare, eroding streambanks with vegetated, stable streambanks are allowed in accordance with the provisions of this paragraph, thereby reducing current and future bank erosion and instream sedimentation, and improving habitat conditions for the slenderclaw crayfish.

(A) Streambanks 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).

(B) The methods of streambank stabilization described in paragraph (b)(2)(iv)(A) must not include the sole use of quarried rock (rip-rap) or the use of rock baskets or gabion structures; however, rip-rap, rock baskets, or gabion structures may be used in conjunction with the methods of streambank stabilization described in paragraph (b)(2)(iv)(A).

(C) Streambank stabilization projects must be performed at base-flow or low water conditions and when significant rainfall is not predicted.

(D) Streambank stabilization projects must keep all equipment out of the stream channels and water.

(v) Federal and State law enforcement officers may possess, deliver, carry, transport or ship slenderclaw crayfish taken in violation of the Act as necessary in performing their official duties.

4. Amend § 17.95(h) by adding, in alphabetical order, an entry for "Slenderclaw Crayfish (*Cambarus cracens*)" to read as set forth below:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(h) *Crustaceans.*

* * * * *

Slenderclaw Crayfish (*Cambarus cracens*)

(1) Critical habitat units are depicted for DeKalb and Marshall Counties, Alabama, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the slenderclaw crayfish consist of the following components:

(i) Geomorphically stable, small to medium, flowing streams:

(A) That are typically 19.8 feet (ft) (6 meters (m)) wide or smaller;

(B) With attributes ranging from:

(*1*) Streams with predominantly large boulders and fractured bedrock, with widths from 16.4 to 19.7 ft (5 to 6 m), low to no turbidity, and depths up to 2.3 ft (0.7 m), to

(*2*) Streams dominated by small substrate types with a mix of cobble, gravel, and sand, with widths of approximately 9.8 feet (3 m), low to no turbidity, and depths up to 0.5 feet (0.15 m);

(C) With substrate consisting of boulder and cobble containing abundant interstitial spaces for sheltering and breeding; and

(D) With intact riparian cover to maintain stream morphology and to reduce erosion and sediment inputs.

(ii) Seasonal water flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the crayfish's habitat and food availability.

(iii) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; and minimal levels of 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.

(iv) Prey base of aquatic macroinvertebrates and detritus. Prey items may include, but are not limited to, insect larvae, snails and their eggs, fish and their eggs, and plant and animal detritus.

(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 this rule.

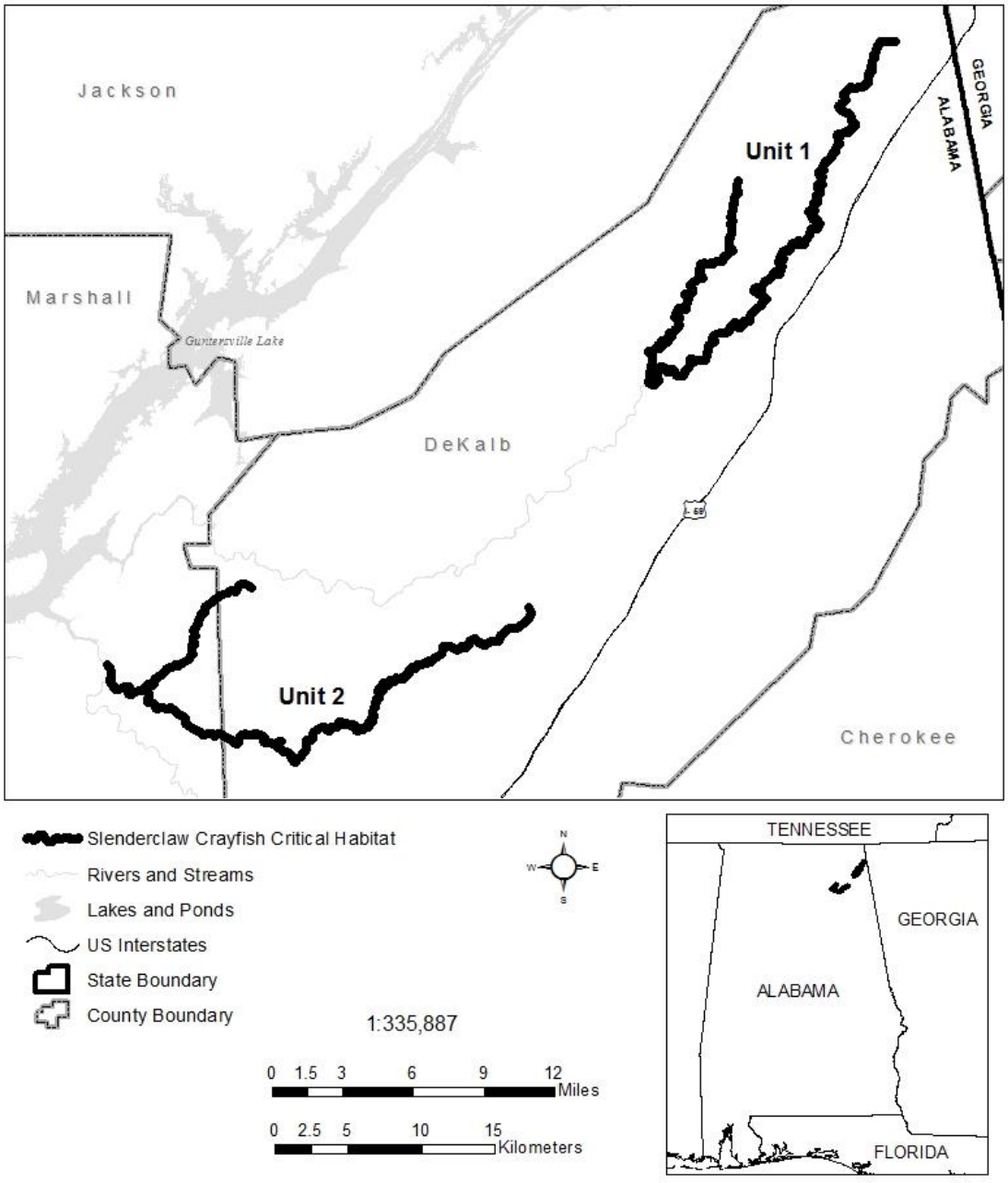
(4) *Critical habitat map units*. Data layers defining map units were created using Universal Transverse Mercator (UTM) Zone 16N coordinates and species' occurrence data. The hydrologic data used in the maps were extracted from U.S. Geological Survey National Hydrography Dataset High Resolution (1:24,000 scale) using Geographic Coordinate System North American 1983 coordinates. 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 or both on which each map is based are available to the public at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069 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) Index map follows:

Slenderclaw Crawfish (*Cambarus cracens*)

Critical Habitat Index Map

Marshall and DeKalb Counties, Alabama

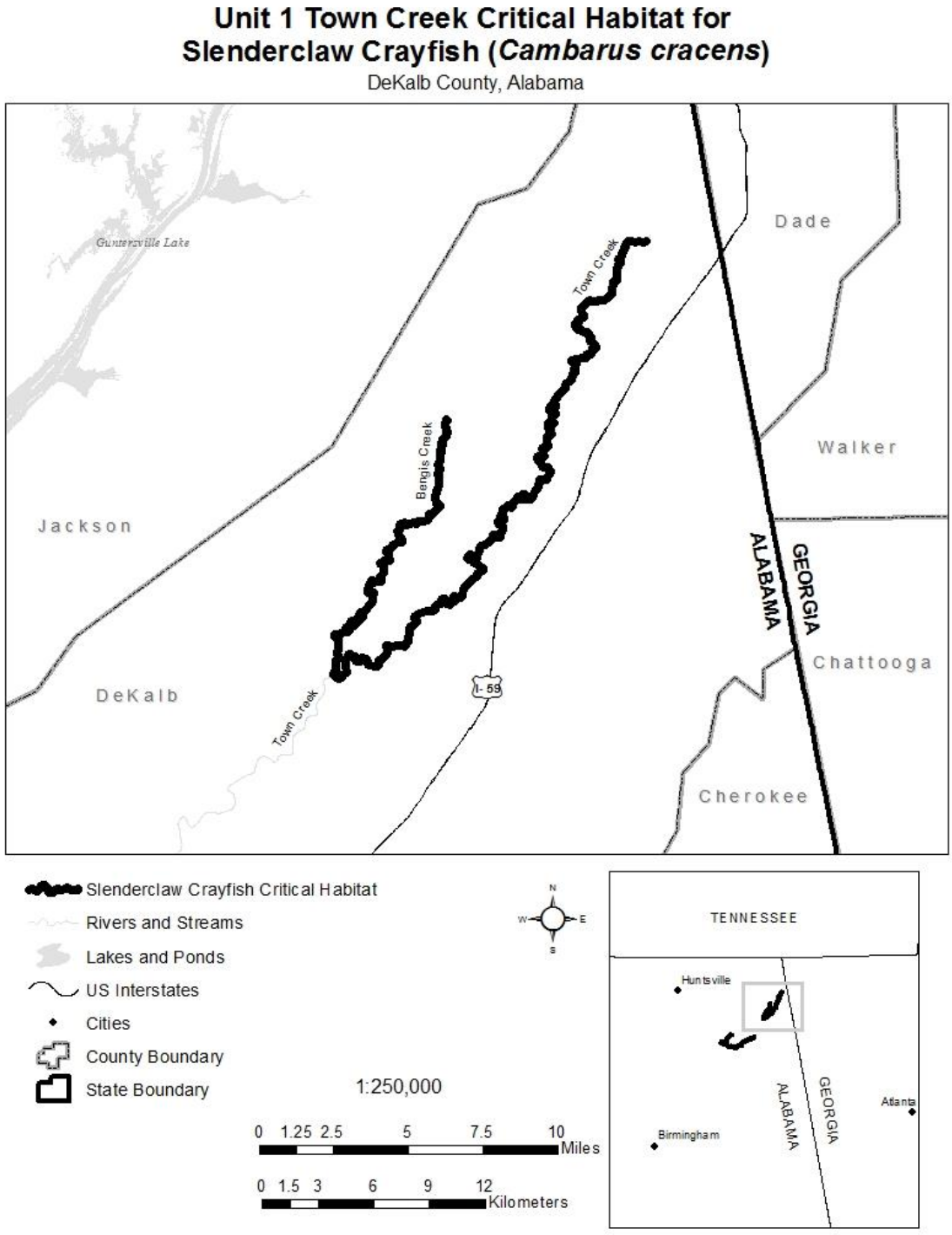


(6) Unit 1: Town Creek, DeKalb County, Alabama.

(i) This unit consists of 41.8 river miles (67.2 river kilometers) of occupied habitat in Bengis and Town creeks. Unit 1 includes stream habitat up to bank full height consisting of the

headwaters of Bengis Creek to its confluence with Town Creek and upstream to the headwaters of Town Creek.

(ii) Map of Unit 1 follows:



(7) Unit 2: Short Creek, DeKalb and Marshall Counties, Alabama.

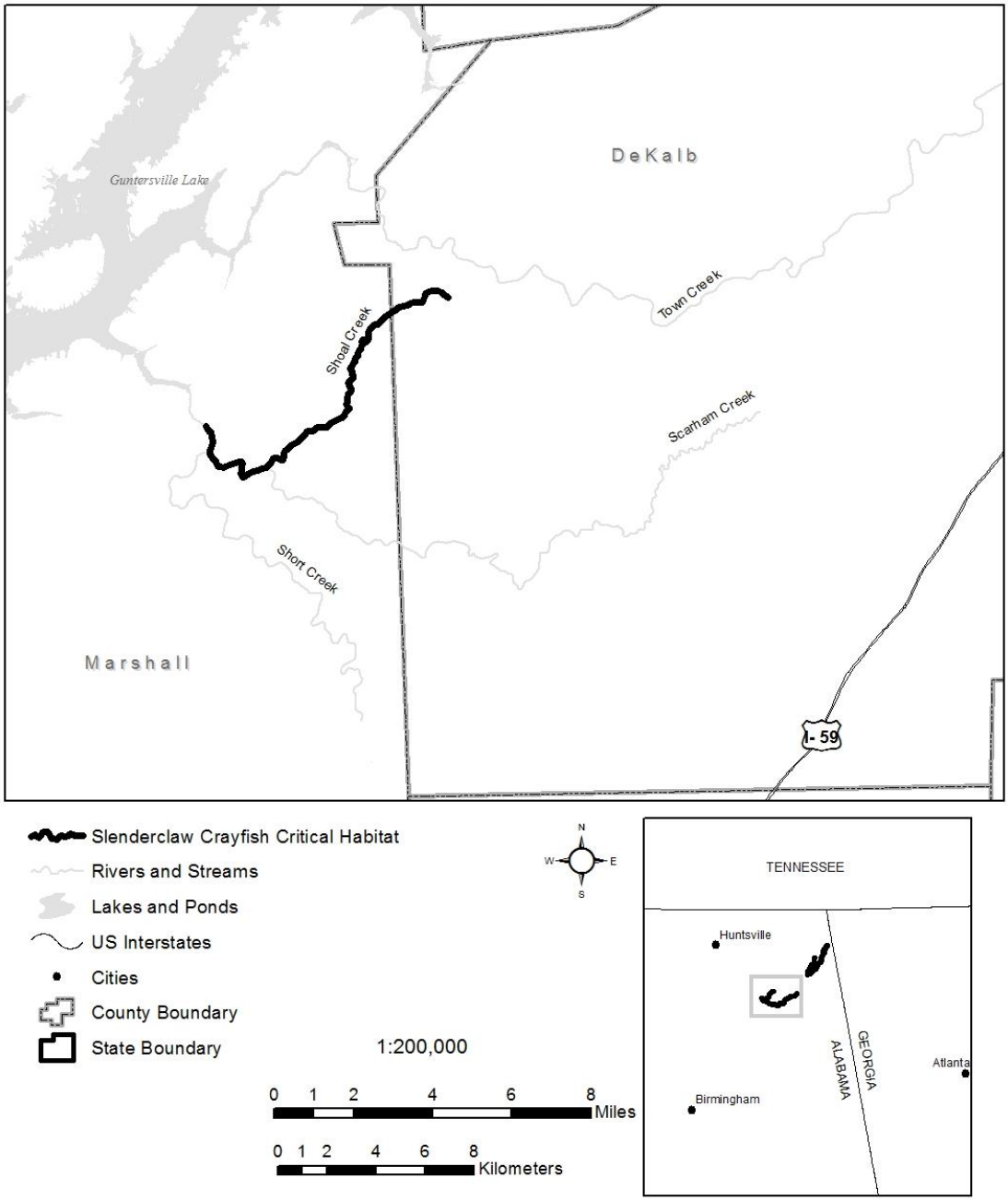
(i) Subunit 2a: Shoal Creek and Short Creek, DeKalb and Marshall Counties, Alabama.

(A) This subunit consists of 10.3 river miles (16.6 river kilometers) of occupied habitat in Scarham, Shoal, Short, and Whippoorwill Creeks. Subunit 2a includes stream habitat up to bank full height consisting of the headwaters of Shoal Creek to its confluence with Whippoorwill Creek, Whippoorwill Creek to its confluence with Scarham Creek, Scarham Creek to its confluence with Short Creek, and Short Creek to its downstream extent to the Guntersville Lake Tennessee Valley Authority project boundary.

(B) Map of Subunit 2a follows:

Subunit 2a: Shoal Creek and Short Creek Critical Habitat for Slenderclaw Crayfish (*Cambarus cracens*)

DeKalb and Marshall Counties, Alabama



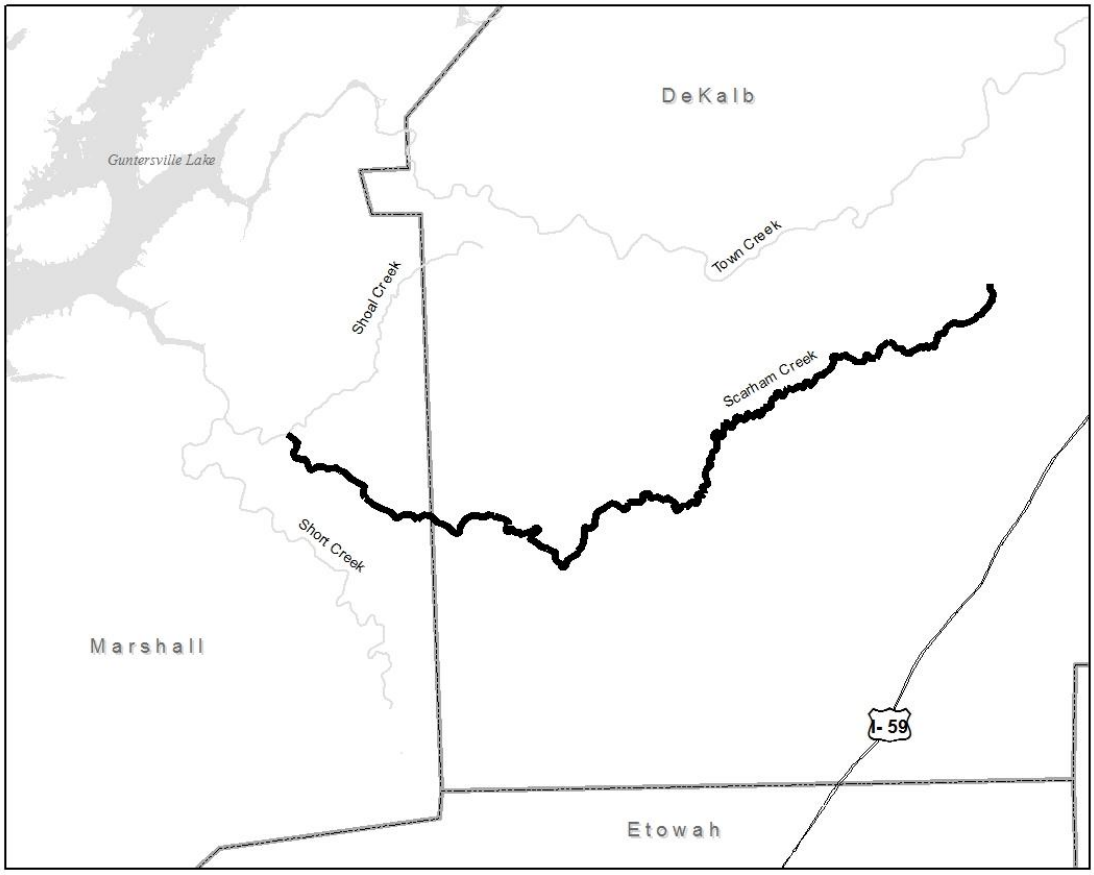
(ii) Subunit 2b: Scarham-Laurel Creek, DeKalb and Marshall Counties, Alabama.

(A) This subunit consists of 25.9 river miles (41.7 river kilometers) of unoccupied habitat in Scarham-Laurel Creek. Subunit 2b includes stream habitat up to bank full height consisting of the headwaters of Scarham-Laurel Creek to its confluence with Whippoorwill Creek.

(B) Map of Subunit 2b follows:

Subunit 2b: Scarham-Laurel Creek Critical Habitat for Slenderclaw Crayfish (*Cambarus cracens*)

DeKalb and Marshall Counties, Alabama



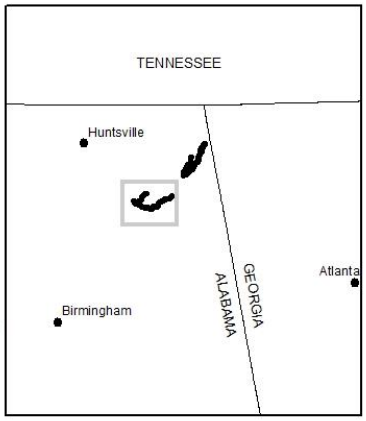
Slenderclaw Crayfish Critical Habitat
Rivers and Streams
Lakes and Ponds
US Interstates
Cities
County Boundary
State Boundary

N
W
E
S

1:200,000

0 1 2 4 6 8 Miles

0 1 2 4 6 8 Kilometers



* * * * *

Dated: September 20, 2018

Signed: **James W. Kurth,**

Deputy Director,
U.S. Fish and Wildlife Service,
Exercising the Authority of the Director,
U.S. Fish and Wildlife Service.

[FR Doc. 2018-21797 Filed: 10/5/2018 8:45 am; Publication Date: 10/9/2018]