

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17**

[Docket Nos. FWS–R4–ES–2017–0061 and FWS–R4–ES–2020–0137; FF09E2100 FXES1111090FEDR 223]

RIN 1018–BC14; 1018–BD50

Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for Panama City Crayfish and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), list the Panama City crayfish (*Procambarus econfinae*), a terrestrial crayfish species native to Bay County, Florida, as a threatened species with a rule issued under section 4(d) of the Endangered Species Act of 1973 (Act), as amended. We also designate critical habitat for the species under the Act. In total, approximately 4,138 acres (1,675 hectares (ha)) in Bay County, Florida, fall within eight units of critical habitat. This rule extends the Act's protections to the species and its designated critical habitat.

DATES: This rule is effective February 4, 2022.

ADDRESSES: This final rule is available on the internet at <https://www.regulations.gov>. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at <https://www.regulations.gov> at Docket Nos. FWS–R4–ES–2017–0061 and FWS–R4–ES–2020–0137.

The coordinates or plot points or both from which the maps are generated are included in the decision file for this critical habitat designation and are available at <https://www.regulations.gov> at Docket No. FWS–R4–ES–2020–0137 and at the Florida Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**, below). The critical habitat shapefile is available on the Service's Environmental Conservation Online System (ECOS) portal at <https://www.ecos.fws.gov>.

FOR FURTHER INFORMATION CONTACT: Lourdes Mena, Classification and Recovery Division Manager, Florida Ecological Services Field Office, U.S. Fish and Wildlife Service, 7915 Baymeadows Way, Suite 200, Jacksonville, FL 32256; telephone 904–

731–3134. 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, a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become endangered in the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the Panama City crayfish meets the definition of a threatened species; therefore, we are listing it as such and finalizing a designation of its critical habitat. Listing a species as an endangered or threatened species and designation of critical habitat can be completed only by issuing a rule.

What this document does. This rule lists the Panama City crayfish (*Procambarus econfinae*) as a threatened species with a rule issued under section 4(d) of the Act (a "4(d) rule") and designates critical habitat in eight units totaling approximately 4,138 acres (1,675 ha) in Bay County, Florida.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that habitat loss and fragmentation from development (Factor A) is the primary threat to the Panama City crayfish.

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary) to designate critical habitat concurrent with listing to the maximum extent prudent and determinable. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical

area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Economic analysis. In accordance with section 4(b)(2) of the Act, we prepared an economic analysis of the impacts of designating critical habitat. On April 15, 2021, we published an announcement of, and solicited public comments on, the draft economic analysis (86 FR 19838). We received general comments that the designation would harm the local economy, but we received no specific or substantial information that would require altering the draft economic analysis. Therefore, we have adopted the draft economic analysis as final. As noted below in Summary of Changes from Proposed Rule, we revised the critical habitat designation and removed 3,039 acres (1,230 hectares (ha)) from the proposed designation. Accordingly, the estimated costs presented in the draft economic analysis will likely be reduced as a result of a smaller final designation of critical habitat.

Peer review and public comment. Prior to our development of our January 3, 2018, and April 15, 2021, proposed rules (83 FR 330 and 86 FR 19838, respectively), we received peer reviews of the Species Status Assessment (SSA) report from eight experts, which informed our assessment that we used for this rulemaking. We also considered all comments and information we received from the public during the two public comment periods for the proposed rules.

Previous Federal Actions

Please refer to the Panama City crayfish proposed listing rule (83 FR 330) published on January 3, 2018, and the reopening of the comment period for the proposed listing rule with a proposed 4(d) rule and critical habitat designation (86 FR 19838) published on April 15, 2021, for detailed descriptions of previous Federal actions concerning this species.

Supporting Documents

A species status assessment (SSA) team prepared an SSA report for the Panama City 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.

Summary of Changes From the Proposed Rule

This final rule incorporates several changes to our proposed 4(d) rule and critical habitat designation (86 FR 19838; April 15, 2021).

For the 4(d) rule, we removed the incidental take exception for conservation and restoration efforts by the Service or State wildlife agencies because the provisions of 50 CFR 17.31(b), which amount to the same or similar allowances, apply to the Panama City crayfish. In addition, based on comments we received, we clarified the incidental take exception for maintenance activities associated with rights-of-way to include mowing, use of herbicides, and mechanical side trimming, and we added the replacement of critical structural components, such as crossarms, insulators, conductors, etc., to this take exception in the 4(d) rule.

For the critical habitat designation, we made changes based on updated aerial photography, new information about permitted developments, and more recent information about Panama City crayfish habitat use in secondary soils. By using 2020 aerial photography (Bay County Property Appraiser 2020, unpaginated), we removed unsuitable or developed parcels, resulting in removal of approximately 473 acres (191 ha) from the critical habitat designation. The new aerial photography also revealed an additional 1.9 acres (0.8 ha) of habitat, confirmed by the occurrence of hydric soils, suitable grasses, and a high concentration of Panama City crayfish, which we added to Unit 1 (19th Street). We also revised our critical habitat delineation protocol based on new information with respect to how Panama City crayfish uses secondary soils. In the April 15, 2021, proposed rule, we used a 100-meter (m) (328-foot) buffer from the core soils into the secondary soils, but our more recent analysis uses a 15-m (50-foot) buffer from the core soils into the secondary soils, capturing 71 percent of all Panama City crayfish occurrences, and reducing the amount of designated critical habitat by 2,566 acres (1,038 ha). We have determined that the 50-foot buffer provides a better method to focus protection on lands that are likely occupied more consistently than those that may be occupied only during seasons or years with high rainfall

events. Therefore, in this rule, we use the refined 50-foot buffer boundary to capture lands likely used by the Panama City crayfish all of the time versus land used only during a shorter portion of the crayfish's life cycle when rainfall is high. This approach better represents the habitat containing the primary biological features and supporting the Panama City crayfish a majority of the time. Given current information, Panama City crayfish are not likely to persist during drought years. Activities authorized, funded, or carried out by a Federal agency that may affect areas occupied by the species for part of its life cycle will still be subject to section 7 of the Act. As a result of these modifications, the final amount of designated critical habitat is 4,138 acres (1,675 ha), a decrease of 3,039 acres (1,230 ha) from the proposed designation.

I. Final Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the Panama City crayfish is presented in the SSA report, version 2.0 (Service 2019). The full SSA report can be found on the Service's Environmental Conservation Online System (ECOS) portal at <https://ecos.fws.gov/ecp/species/8915> and at <http://www.regulations.gov> under Docket Nos. FWS-R4-ES-2017-0061 and FWS-R4-ES-2020-0137.

Species Description

The Panama City crayfish is a small, semi-terrestrial crayfish that grows to about 2 inches (in) (50.8 millimeters (mm)) in length (minus claws), and is found in south-central Bay County, Florida. The species' color pattern consists of a medium dark-brown background color, lighter brown mid-dorsal stripe, and darker brown dorsolateral stripes (Florida Fish and Wildlife Conservation Commission (FWC) 2016, p. 1). The Panama City crayfish was first described by Hobbs in 1942, from Bay County, Panama City, Florida. The Panama City crayfish is classified in the family Cambaridae and is a recognized taxon by the scientific community (Taylor et al. 2007; Integrated Taxonomic Information System 2017).

The life history of the Panama City crayfish specifically is not well known. Cambarid crayfish may live about 2.5 to 3 years (Hobbs 2001, p. 977), with a generation period of 2 years. For this family of crayfish, the majority breed more than once, with mating among mature yearlings frequent; however, many individuals do not become

sexually active until late summer or fall. Females may produce between 30 and 160 eggs and have been found with eggs and/or young from March through September. Juveniles are most frequently found in the summer and have been observed through December, so juveniles appear to be produced from at least March through December. Juveniles can be carried overland by moving water during rainy periods, which aids in dispersal (Keppner and Keppner 2002, p. 11).

Eight crayfish species occur within the range of the Panama City crayfish, although only the hatchet crayfish and the jackknife crayfish are found in the same habitat as the Panama City crayfish and may co-occur with it (FWC 2017, p. 1). The Panama City crayfish is not known to hybridize with other species of crayfish.

Historically, the species inhabited natural and often temporary bodies of shallow fresh water within open pine flatwoods and wet prairie-marsh communities. However, most of these communities have been cleared for residential or commercial development or replaced with slash pine plantations. The Panama City crayfish currently inhabits the waters of grassy, gently sloped ditches and swales, slash pine plantations, utility rights-of-way, and a few remnant parcels protected under wetland and private easements (FWC 2016, p. 2).

The highest densities of Panama City crayfish have been recorded in areas with little to no shrub or tree cover (FWC 2016, p. 2). Suitable habitat is normally dominated by herbaceous vegetation. Lowest population densities have occurred in small, open sites where shrubs or trees were present, or in the furrows between bedding rows in some pine plantations (Keppner and Keppner 2005). When encountered in dense titi (*Cyrtilla racemiflora* and *Cliftonia monophylla*) swamps, the species was associated with temporarily inundated areas open to the sun with some herbaceous vegetation. Such sites may be considered secondary or suboptimal habitat for the species. On sites where mixed habitat features are present (e.g., partially wooded sites or sites with permanent, deep-water ponds), the Panama City crayfish appears to select favorable areas dominated by herbaceous vegetation, with shallow or fluctuating water levels (FWC 2016, p. 3; Keppner and Keppner 2005, p. 2).

The Panama City crayfish relies on particular soil types for burrow construction and supporting herbaceous vegetation; these soil types are categorized as core or secondary soils.

Core soils, or those that sustain long hydroperiod wetlands, provide the best substrate to support the species; secondary soils, or those that support short hydroperiod wetlands, are less ideal but still used (Service 2019, p. 23). Because they must have wet conditions for survival, Panama City crayfish rely on the dynamics of the flow of water and wetness of the soils for dispersal. These habitat restrictions and limited dispersal ability make the crayfish have low adaptive ability. The core and secondary soil types that support Panama City crayfish within the species' known range are described in more detail in the SSA report (Service 2019, pp. 23–24).

Panama City crayfish build burrows for shelter, which are normally in or adjacent to surface water when it is present in the hydric soils they inhabit (Hobbs 1981, entire). They construct burrows that contact the water table as the surface water of their habitat recedes, and they occupy burrows when surface water is absent or during periods of extreme water temperatures. They emerge from the burrows when surface water is present again or water temperatures are favorable. It appears

that they can survive significant periods of drought in their burrows when they can maintain contact with the water table. During these dry periods, the Panama City crayfish excavates and lives in unbranched burrows up to 3 feet long that extend down to the water table, thereby enabling the species to remain adequately hydrated to survive (FWC 2016, p. 3).

Little is known about the specific feeding habits of the Panama City crayfish. Observations of Panama City crayfish that were held in aquaria spanning 1.5 plus years (Keppner and Keppner 2014, entire) indicate that they are detritivores and herbivores. Specimens were offered dead animal material, but they avoided it in favor of processing the substrate for particles of prepared fish food and the fresh aquatic vegetation that were provided as primary food sources. Herbaceous vegetation likely serves as a food source for the Panama City crayfish.

The Panama City crayfish historically ranged throughout south-central Bay County, Florida, within a 56-square-mile area (14,504 ha; see figure, below). The historical range likely created one population connected by core and

secondary soils. As urban growth came to Panama City, the range of the Panama City crayfish became fragmented into isolated patches. Today, the species has 12 localized (*i.e.*, isolated) populations that can be divided into two groups, based on patterns in fragmentation from urban development: The western group and eastern group, using Transmitter Road as the primary division. Localized populations were delineated using a landscape genetic analysis based on a pattern of isolation-by-distance, where increasing geographic separation tends to reflect increasing genetic differentiation (Duncan et al. 2017, entire). A genetic analysis describes eight localized populations occurring in a western grouping and four localized populations occurring in an eastern grouping (Duncan et al. 2017, entire). The 12 populations are described in more detail in the SSA report (Service 2019, pp. 32–52), and are referred to as 19th Street, Old Airport, 390 West, Talkington, Minnesota, Edwards, Transmitter West, College Point, Deer Point, High Point, Star, and Transmitter East. Three of the populations are considered functionally extirpated (Old Airport, Minnesota, and College Point).

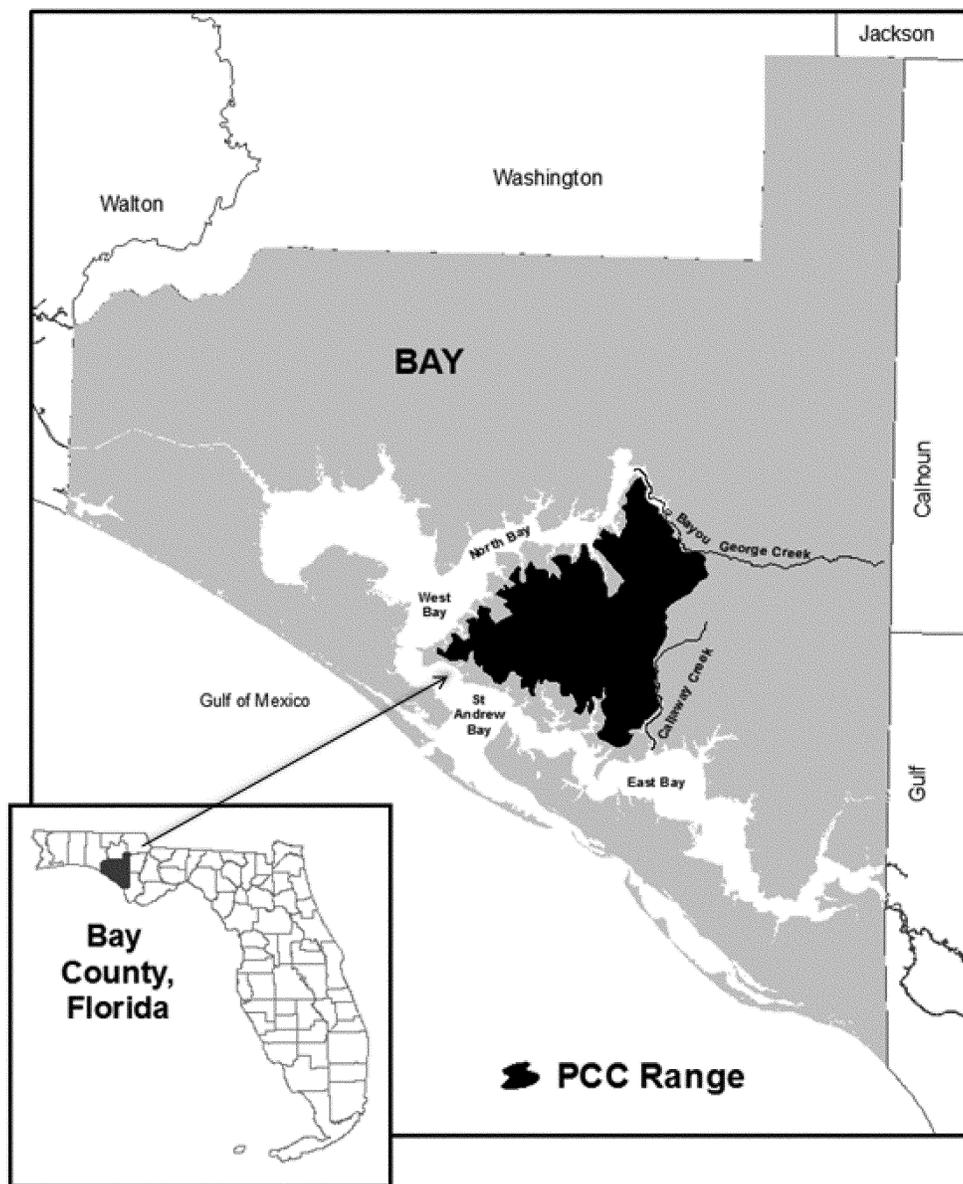


Figure: Range of the Panama City crayfish.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an “endangered species” or a “threatened species.” The Act defines an “endangered species” as a species that is in danger of extinction throughout all or a significant portion of its range, and a “threatened species” as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an “endangered species” or a “threatened

species” because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or
- (E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may

have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

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

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

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our January 3, 2018, proposed rule (83 FR 330) described “foreseeable future” for the Panama City crayfish as 20 to 30 years, which encompasses 10 to 15 generations, which we stated in that proposal is more than sufficient time to determine the species’ response to stressors. On August 27, 2019, the Service published a final rule (84 FR 45020) codifying its understanding of “foreseeable future” at 50 CFR 424.11(d). Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term “foreseeable future” extends only so far into the future as the Service can reasonably determine that both the future threats and the species’ responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those

threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

The regulations at 50 CFR 424.11(d) did not significantly modify the Service’s interpretation; rather, they codified a framework that sets forth how the Service will determine what constitutes the foreseeable future based on our long-standing practice. Accordingly, although the regulations at 50 CFR 424.11(d) do not apply to this final rule for the Panama City crayfish because the crayfish’s listing was proposed prior to the effective date of the August 27, 2019, final rule, application of the regulations at 50 CFR 424.11(d) would not change the Service’s assessment of foreseeable future for the Panama City crayfish as contained in our January 3, 2018, proposed rule and in this final rule.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent a decision by the Service on whether the species should be listed as an endangered or threatened species under the Act. It does, however, provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results and conclusions from the SSA report.

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

requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

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

Summary of Biological Status and Threats

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

The Panama City crayfish needs freshwater wetlands that support herbaceous vegetation, which is important to the Panama City crayfish for food, shelter, and detritus formation. The species needs core or secondary soils to provide the proper sediment structure for burrow construction and to support the herbaceous vegetation. The Panama City crayfish needs access to groundwater (through burrowing) or surface water to prevent desiccation of individuals and populations. The species needs both adequate water quality and quantity to fulfill its life history.

To evaluate the current and future viability of the Panama City crayfish, we assessed a range of conditions to allow us to consider the species’ resiliency, representation, and redundancy. For the Panama City crayfish to maintain viability, its populations or some portion thereof must be adequately resilient. To assess resiliency, we analyzed data related to two population factors (inbreeding rate and isolation) and three habitat factors (urbanization, protection/management, and suitable area) (see Table 1, below). Population condition rankings and habitat condition rankings were determined by combining these five factors, and then overall condition rankings were

categorized as high, medium, or low condition. High condition equates to a healthy condition with a high likelihood of persistence in the near term, low is declining condition with a low likelihood of persistence in the near term, and moderate condition is in between high and low (Service 2019, p. 60).

TABLE 1—POPULATION AND HABITAT FACTORS FOR PANAMA CITY CRAYFISH (PCC)
[Service 2019, p. 60]

PCC condition rankings	Population factors		Habitat factors		
	Inbreeding rate ¹	Population isolation	Urbanization ²	Protection and management ³	Suitable area ⁴
High	<or = 0	Large site with multiple sub-populations and shares a border with another habitat unit.	<33% developed and unsuitable.	Easements or rights-of-way (ROWs) with >15 acres in suitable habitat.	>1,000 acres.
Moderate ..	0–0.1	Small or moderately sized site that shares a border with another habitat unit.	33–66% developed and unsuitable.	Easements or ROWs with ≤15 acres in suitable habitat.	100–1,000 acres.
Low	>0.1	Small or moderately sized site that is not connected to another.	>66% developed and unsuitable.	No habitat protections	<100 acres.

¹ “Inbreeding Rate” refers to outbreeding and random mating result in a F_{IS} coefficient less than or equal to 0; a high rate of inbreeding is generally thought to be $F_{IS} > 0.1$.
² “Urbanization” is the percentage of developed and unsuitable acres within the area supporting each population.
³ “Protection and Management” considers whether the site has had any easements or rights-of-way (ROWs) in suitable habitat that are protected against development, and then the easements and ROWs are ranked by size.
⁴ “Suitable Area” means the acres of undeveloped core and secondary soils within the habitat unit.

We described representation for the Panama City crayfish in terms of a single meta-population with low adaptive ability that was once connected through core and secondary soils but is currently inhabiting “islands” of habitat due to fragmentation of habitat from urbanization, resulting in limited dispersal and low adaptive ability. We assessed Panama City crayfish redundancy in the context of the species’ historical range compared to its current range, and the relative risk of the distribution throughout the range to catastrophic events.

Factors Influencing Panama City Crayfish Viability

Freshwater aquatic systems face a multitude of natural and anthropogenic threats and stressors (Neves et al. 1997, p. 44). The FWC has identified multiple factors that have impacts on Panama City crayfish populations and habitats, most of which are related to human activities (FWC 2016, entire). Due to its persistence within a rapidly urbanizing landscape, the Panama City crayfish has adapted and is presently found in or near habitats that have been altered to varying degrees, which are no longer considered natural or wild. These include roadside ditches, rights-of-way, clearings in silvicultural land, and residential property. Potential threats to Panama City crayfish include further habitat loss and degradation, habitat fragmentation, and isolation. Other possible factors affecting survival include direct mortality related to construction activities, incompatible applications of chemicals or spills, off-road vehicle use, illegal harvest, and direct competition with indigenous and/or nonindigenous species.

Generally, these factors can fall into two categories: population-scale (localized) threats and rangewide stressors or systematic changes. Current and potential future effects, along with current distribution and abundance, help inform viability and, therefore, vulnerability to extinction. Below, we describe the primary stressors to the Panama City crayfish, which are habitat degradation, loss, and fragmentation; water quality; bait collection; climate change; and sea level rise. Other factors, such as direct mortality, disease, predation, competition, or impacts from off-road vehicle use, were not considered to have species-level impacts (see 83 FR 330, January 3, 2018), and therefore are not discussed further here.

Threats and Environmental Stressors

Habitat Degradation, Loss, and Fragmentation: Development projects and land conversion can result in direct loss of habitat, leading to fragmentation and isolation of populations. Historically, the Panama City crayfish inhabited natural and often temporary bodies of shallow fresh water within open pine flatwoods and wet prairie-marsh communities. The Panama City crayfish’s natural habitat (wet pine flatwoods) has been lost or degraded through residential, commercial, and industrial development, as well as conversion to intensive pine silviculture, and for ranching and farming uses. No unaltered natural pine flatwoods remain within the Panama City crayfish’s current range. Most known Panama City crayfish current occurrences are in human-altered habitats and are vulnerable to further loss or alteration. Although artificial habitats such as roadside ditches and

rights-of-way have allowed the Panama City crayfish to survive in areas from which they would otherwise likely have been extirpated, human activities can alter the hydrology and configuration of these sites, making them unsuitable for long-term Panama City crayfish survival. For example, roadside ditch maintenance and construction activities have resulted in the destruction of several crayfish sites.

Infrastructure development has impacted, or is anticipated to impact, several known crayfish sites. For example, several road construction or expansion projects, such as the widening of Star Avenue and Kern Avenue and the widening and hardening of Tram Road, may impact Panama City crayfish habitat in the future. Infrastructure development can eliminate suitable Panama City crayfish habitat by removing the required herbaceous vegetation and digging up the surrounding soils.

Silvicultural practices such as ditching and bedding, roller chopping, installing fire breaks, and constructing roads can alter the hydrology of Panama City crayfish sites, create physical barriers to crayfish movement, and destroy underground burrows. These activities may contribute to the isolation of Panama City crayfish populations. Fire suppression and high tree density on silvicultural sites can reduce herbaceous groundcover necessary for suitable crayfish habitat. Similarly, removal of tree canopy cover, changes in ground cover vegetation, and associated changes in water quality and surface water availability are all possible changes associated with the effects of conversion to farming and ranching practices, such as cattle grazing. These activities reduce the

suitability of the habitat for the Panama City crayfish. Although minimal changes to habitat in the future are expected to occur from farming and ranching practices, conversion from silviculture to grazing use has historically occurred on lands adjacent the crayfish's range.

Ditching and draining urban areas is a common practice in efforts to control local flooding events and reduce mosquito outbreaks but could have accidental impacts, especially to populations with small amounts of available habitat, by artificially draining or decreasing the amount of time that surface waters are available. The majority of known Panama City crayfish occurrences, particularly in the western part of the range, are in roadside ditches and swales and thus are vulnerable to impacts from ditching and draining activities. Additionally, nearly all populations are isolated from other Panama City crayfish populations by roads and development. Fragmentation and isolation can increase vulnerability to local extirpation due to adverse genetic, demographic, and environmental events. Further, when Panama City crayfish are extirpated from an area, lack of habitat connections between sites can prevent Panama City crayfish from recolonizing (FWC 2016, p. 10). Recent genetic work indicates the isolation throughout the range has resulted in inbreeding and drift (Duncan et al. 2017, p. 17).

Water Quality: Freshwater crayfish may be sensitive to declines in water quality, and these water quality declines have been identified as a threat to the Panama City crayfish. Water quality declines can range from oxygen-deficient conditions resulting from algal blooms or sewage spills to pollution originating from roadway runoff, pesticide applications, or chemical spills. Given the level of development throughout the range of the Panama City crayfish and the occurrences of Panama City crayfish adjacent to private properties, runoff from roads or incompatible application of chemicals, such as pesticides or fertilizers, negatively impacts water quality and has direct impacts on the species.

Mosquitocides are used within the range of the Panama City crayfish to treat both larval and adult mosquitos. The mosquitocides registered for use within the range of the Panama City crayfish do not pose known threats to water quality if applied per label directions (FWC 2016, p. 10). If incorrectly applied, however, the consequences to the Panama City crayfish can be fatal. Similarly, fertilizers, insecticides, and herbicides

may pose a risk to Panama City crayfish if applied inappropriately. Many substances commonly used around the home or business can be toxic to Panama City crayfish and other wildlife if used or disposed of improperly. Since Panama City crayfish often inhabit ditches and swales close or adjacent to private properties, they are at risk if landowners do not ensure that fertilizers, insecticides, and herbicides are applied and disposed of properly per label directions. Potentially toxic substances such as petroleum products and paint should be properly disposed of at hazardous waste disposal facilities. Accidental spills of large volumes of toxic substances such as petroleum products and acids occasionally occur in urban areas. If spills overflow into ditches, swales, or other areas inhabited by Panama City crayfish, substantial localized impacts to the population are possible.

Bait Collection: Collecting Panama City crayfish for fish bait or other uses may have long-term effects on populations if large numbers of adults are taken from a population. Several lines of evidence indicate that current occupied sites are used as sources for catching crayfish for fish bait. Although this activity is occurring, the magnitude of the impact of recreational harvest on the Panama City crayfish is unknown (Keppner and Keppner 2001, p. 14; Keppner and Keppner 2005, p. 11).

Systematic Changes

Climate Change and Sea Level Rise: The Panama City crayfish was included in a Statewide vulnerability assessment for approximately 1,000 species in Florida (Reece et al. 2013, entire; Hocter et al. 2014, entire) using a Standardized Index of Vulnerability and Value Assessment (SIVVA; Reece and Noss 2014, entire). Based on the data used in this assessment, little suitable habitat for Panama City crayfish will be affected by sea level rise under the A1B scenario (Hocter et al. 2014, p. 10). To further evaluate potential impacts from sea level rise, we used two products to map predicted future changes due to sea level rise in 2025, 2050, and 2075 under a low scenario (0.5 meter) and high scenario (2.0 meters) (Service 2019, pp. 71–74). We used the University of Florida digital elevation sea level rise model to predict habitat loss (Hocter et al. 2014, entire). This model predicts inundation changes based on elevation. We also used the Sea Level Rise Affecting Marshes Model (SLAMM) to predict changes in sea level rise that would affect habitat suitability inland from inundated areas (Clough et al. 2010, entire). Using a 5–30 meter pixel

size, SLAMM simulates the dominant process involved in wetland conversions and shoreline modifications during long-term sea level rise. We assumed these vegetation changes would adequately represent the water quality changes from saltwater intrusion that would affect crayfish survival in affected areas. We looked at overall changes in habitat rangewide as well as within the suitable habitat supporting each individual population.

Overall, little suitable habitat for Panama City crayfish will be directly affected by sea level rise, which confirms prior analyses (Hocter et al. 2014, p. 10). By the year 2075, suitable habitat (in terms of suitable acres of core and secondary soils) within the range of the Panama City crayfish is predicted to be reduced by 1.28 acres (0.01 percent) with 0.5-meter sea level rise and by 40.2 acres (0.26 percent) with 2.0-meter sea level rise (see table 4.1 in Service 2019, p. 73). However, two populations were affected by sea level rise, Deer Point and Old Airport, which respectively sustained loss of 21.02 and 5.89 acres of suitable habitat by the year 2075 with 2.0-meter sea level rise. Indirect effects of sea level rise on Panama City crayfish could be substantial, however. Saltwater intrusion into freshwater habitats will occur far beyond areas that are completely inundated, potentially changing the hydrology and vegetation in Panama City crayfish habitats that are outside the predicted direct sea level rise impact areas. Crayfish spend their entire life in fresh water. Research on crayfish report some levels of saltwater tolerance, but it is believed that their abilities to colonize in the estuarine environment may be restricted to areas of low salinity due to adverse effects of sea water on egg development and hatching (Susanto and Charmantier, 2000, in Yildiz et al. 2004, p. 1271).

Synergistic and Cumulative Effects

Synergistic interactions are possible between the effects of climate change and the effects of other potential threats, such as development. Increases in temperature and changes in precipitation are likely to affect water quality and vegetation, and the Panama City crayfish needs good water quality to survive and is closely associated with the presence of herbaceous vegetation. However, it is difficult to project how climate change will affect herbaceous vegetation because certain plant species may increase in cover, while other species may decrease. Uncertainty about how different plant species will respond to climate change, combined with uncertainty about how changes in plant species composition would affect

suitability of Panama City crayfish habitat, make projecting possible synergistic effects of climate change on the Panama City crayfish highly speculative.

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

Conservation Strategy

We developed a conservation strategy for Panama City crayfish to identify critical conservation needs (Service 2017b, entire). In this conservation strategy, we rely on the known survival

over time of small populations and a published meta-analysis (Traill 2007, entire) to estimate the amount of habitat needed to support population viability. The results of the analysis indicate that a minimum viable population size (MVP) for Panama City crayfish of 5,137 individuals and 2,200 acres of actively managed habitat across the range that is permanently protected and managed across at least seven population units should ensure the Panama City crayfish maintains viability for the foreseeable future. Currently, we have estimated population sizes at three sites (19th Street, Transmitter West, Talkington). Abundance ranges from 34 to 623 Panama City crayfish and 3 to 232 acres (1.2 to 93.9 ha) of suitable habitat, yielding 3 to 9 crayfish per acre. Applying these density values across the currently occupied range yields a rangewide population of 6,600 to 19,800 Panama City crayfish.

The Panama City crayfish needs multiple, adequately resilient populations spread across its range to avoid extinction. We currently estimate that 2,200 acres (890 ha) of permanently protected Panama City crayfish habitat would sustain the viability of multiple (two to four) populations depending on habitat quality. We estimate that protecting 3 to 4 large core habitat units with between 200 and 800 acres (81 and 324 ha), in addition to 3 smaller habitat units (less than 200 acres (81 ha) in

size), to be managed with fire or mowing every 2 to 3 years, along with a plan to restore existing conservation easements that have suitable soils for the crayfish will sustain the crayfish into the future (Service 2017b, entire). We determined the conservation goal of 2,200 acres (890 ha) secured with conservation easements or under public ownership would support Panama City crayfish for the foreseeable future. However, at this time, agreements are not in place to ensure the necessary protections.

Current Conditions of the Panama City Crayfish

The Panama City crayfish historically ranged throughout south-central Bay County, Florida, as one population connected by core and secondary soils. Today, the species has 12 localized populations divided into a western group with 8 populations and an eastern group with 4 populations. While the Panama City crayfish continues to occur within its historical range, only 42 percent of core soils and 43 percent of secondary soils remain undeveloped from historical levels, indicating a loss of 57 percent of historical habitat (Service 2019, p. 58). Population resiliency was estimated as high for 2 populations, moderate for 2 populations, low for 5 populations, and functionally extirpated for three populations (see Table 2).

TABLE 2—SUMMARY OF CURRENT RESILIENCY CONDITION FOR 12 POPULATIONS OF PANAMA CITY CRAYFISH [Service 2019, p. 61]

Habitat area	Inbreeding rate condition	Population isolation	Urbanization	Habitat protection	Suitable habitat area	Overall current resiliency condition
19th Street	Low	Low	Moderate	Moderate	Low	Low.
Old Airport	Low	Low	Moderate	Moderate	Low	Extirpated.
390 West	Low	Low	Low	Moderate	Low	Low.
Talkington	Low	Low	Moderate	Moderate	Low	Low.
Minnesota	Low	Low	High	Moderate	Low	Extirpated.
Edwards	Low	Low	Low	Low	Low	Low.
Transmitter West	Low	Low	High	High	Moderate	Moderate.
College Point	Low	Low	Low	Low	Low	Extirpated.
High Point	Low	Low	High	Moderate	Low	Low.
Deer Point	Low	Low	High	High	Moderate	Moderate.
Star	Low	High	High	High	High	High.
Transmitter East	Low	High	High	High	High	High.

The representation, or adaptive capacity, of the Panama City crayfish has been diminished. Historically, it was one population and now has been fragmented and genetically isolated into 9 extant localized populations (and 3 functionally extirpated populations). The genetic differences across the range correspond to patterns in fragmentation from urban development, resulting in

small crayfish population sizes and poor dispersal ability. Consequently, genetic variation is low, gene flow is limited, and inbreeding is high across the range. Additionally, genetic isolation coupled with presumably low abundance poses risk of further reductions in genetic diversity through genetic drift (random chance by removing rare genotypes completely when some individuals die

without reproducing). Without intervention, the combined effects of prolonged inbreeding and genetic drift can consign a population to a genetic “extinction vortex,” in which lethal mutations and infertility occur in a positive feedback loop, potentially resulting in localized extirpation regardless of other factors.

Redundancy for the Panama City crayfish is low. The current fragmented landscape poses a vulnerability to potential catastrophic hurricanes, sea level rise, salt water intrusion, and large-scale droughts. Panama City crayfish populations are now isolated; thus, recolonization or demographic rescue is unlikely following population-level disturbances. Additionally, the Panama City crayfish occupies an increasing smaller area, thereby increasing the risk of a single event, or series of events, affecting a large portion of extant populations.

Future Conditions of Panama City Crayfish

For the purpose of this assessment, we define viability as the ability of the species to sustain populations in the wild over time. This discussion explains how the stressors associated with habitat loss, fragmentation, and degradation from residential and commercial development will influence resiliency, redundancy, and representation for the Panama City crayfish throughout its current known range using a series of plausible scenarios out to 2030, 2050, and 2070. We predicted both future population factors (inbreeding and population isolation) and habitat factors (urbanization, protections from development, and suitable habitat) and evaluated these to inform our future conditions.

To predict potential future changes related to urban growth, we used layers from the Southeast Regional Assessment Project (SERAP, from the Biodiversity and Spatial Analysis Center at North Carolina State University; 60m resolution), a modification of the SLEUTH Projected Urban Growth model (Jantz et al. 2010, entire; Terando et al.

2014, entire). SERAP identifies the parameters in global and regional models that are most likely to affect the Southeast region’s climate and local landscape dynamics, with the goal of providing decision makers with information about low-probability, high-impact climate extremes through downscaled models and threats analysis. This tool helps inform where the biggest threats from climate change will be on the landscape and, accordingly, identifies high-risk areas for conservation lands and development. We then used these products to map future predicted changes in urbanization in 2030, 2050, and 2070. The uncertainty associated with the SLEUTH model increases over time, and as a result, the species’ response to the dynamic nature of the variables becomes less predictive. There is a greater confidence in predicting potential development and the species’ response to changes in the landscape in the near future rather than the distant future.

To adequately capture uncertainty associated with the degree and extent of potential future stressors and their impacts on species’ requisites, resiliency, redundancy, and representation were assessed using three scenarios: Status quo development (*i.e.*, minimum degree of urbanization that has a high probability of occurring), intermediate development (*i.e.*, moderate degree of urbanization that has a low probability of occurring), and high development (*i.e.*, high degree of urbanization that has a very low probability of occurring). The scenarios included projecting possible future development using the SERAP model (Jantz et al. 2010, entire; Terando et al. 2014, entire). They also describe the predicted effects of the development on

loss and fragmentation of suitable habitat rangewide and on each of 12 known populations, and draw inferences about population health (Duncan et al. 2017, entire). We excluded three populations (College Point, Old Airport, and Minnesota) from our scenario analysis because Panama City crayfish are currently extirpated at these sites and they will not be able to maintain viability in these locations in the future without deliberate introduction or translocation efforts. Although we provide all three scenarios, initial changes in patterns of development following Hurricane Michael (2018) indicate that the high development scenario is more likely than we previously thought because of the housing damage and subsequent shortage caused by this Category 5 storm. Please refer to the SSA report for the full analysis of the future scenarios (Service 2019, pp. 79–92).

Under the range of plausible future development scenarios, habitat loss ranges from 1,401 to 6,130 acres of habitat rangewide as developed land increases from 20,221 to 28,899 acres between 2030 and 2070. Under all three scenarios, the loss and degradation (fragmentation) of habitat reduce the number of sufficiently resilient populations in high or moderate condition from four to three by 2030. This loss of resiliency comes from both a reduction in habitat elements as well as the effects of isolation and genetic drift for all 12 populations. Under each of the three future scenarios, all western populations are categorized as low condition by 2030 (see Table 3, below), resulting in a near total loss of redundancy and representation. In the eastern group, three of four populations are projected to maintain moderate or high resiliency through 2070.

TABLE 3—FUTURE CONDITION SUMMARY OF PANAMA CITY CRAYFISH

[Populations above the double line are in the western group; populations below the double line are in the eastern group.]

Population name	Current	Year	Status quo	Intermediate development	High development
19th Street	Low	2030	Low	Low	Low.
		2050	Low	Low	Low.
		2070	Low	Low	Low.
Old Airport	Extirpated	2030	Extirpated	Extirpated	Extirpated.
		2050	Extirpated	Extirpated	Extirpated.
		2070	Extirpated	Extirpated	Extirpated.
390 West	Low	2030	Low	Low	Low.
		2050	Low	Low	Low.
		2070	Low	Low	Low.
Talkington	Low	2030	Low	Low	Low.
		2050	Low	Low	Low.
		2070	Low	Low	Low.
Minnesota	Extirpated	2030	Extirpated	Extirpated	Extirpated.
		2050	Extirpated	Extirpated	Extirpated.
		2070	Extirpated	Extirpated	Extirpated.
Edwards	Low	2030	Low	Low	Low.

TABLE 3—FUTURE CONDITION SUMMARY OF PANAMA CITY CRAYFISH—Continued
 [Populations above the double line are in the western group; populations below the double line are in the eastern group.]

Population name	Current	Year	Status quo	Intermediate development	High development
Transmitter West	Moderate	2050	Low	Low	Low.
		2070	Low	Low	Low.
		2030	Low	Low	Low.
		2050	Low	Low	Low.
College Point	Extirpated	2070	Low	Low	Low.
		2030	Extirpated	Extirpated	Extirpated.
		2050	Extirpated	Extirpated	Extirpated.
		2070	Extirpated	Extirpated	Extirpated.
High Point	Low	2030	Low	Low	Low.
		2050	Low	Low	Low.
		2070	Low	Low	Low.
		2030	Moderate	Moderate	Moderate.
Deer Point	Moderate	2050	Moderate	Moderate	Moderate.
		2070	Moderate	Moderate	Moderate.
		2030	High	High	High.
		2050	High	High	High.
Star	High	2070	High	High	High.
		2030	High	High	High.
		2050	High	High	High.
		2070	High	High	High.
Transmitter East	High	2030	High	High	High.
		2050	High	High	High.
		2070	High	High	High.
		2030	High	High	High.

We also evaluated a “conservation scenario,” which is based on a conservation strategy that includes permanent protection and management of approximately 2,200 acres (890 ha) of habitat across seven populations (Service 2017b, entire). The predicted outcomes of the conservation scenario are straightforward, with populations with higher resiliency continuing to maintain or have improved resiliency in the future as land management efforts improve. Although anticipated habitat protection and habitat management will not immediately change any of the overall current condition ranks, it should, when coupled with the population management measures agreed to by FWC and the Service, ensure that populations with high resiliency will remain so regardless of future development, which is the primary threat to the Panama City crayfish. Additionally, population management measures (e.g., translocation) detailed in this scenario should improve the genetic health and population size of several managed populations. Finally, improved monitoring and applied research agreed to by the Service and FWC should also improve our knowledge of the status of each population to better adjust management actions as needed in the future. However, at this time, agreements are not in place to ensure the necessary protections, and we do not have certainty about whether and where, or in what configuration, those protections may occur on the landscape.

All plausible future scenarios had similar outcomes for the species. Our

overall estimate of the Panama City crayfish’s current viability is low across the majority of its geographic range, particularly in the urbanized western portion. Ongoing and future development will likely result in low resiliency across 70 percent of the species’ range by as soon as 2030. If the remainder (30 percent) of its range is protected from development and conservation efforts are focused in this less developed area, we project the species will maintain resiliency in three populations for the foreseeable future.

As Panama City crayfish are endemic to a small area with limited variation in local conditions prior to modern urbanization, a large-scale disturbance will impact all habitats and populations similarly, putting the species at risk of extinction due to a single event larger than the 10 linear miles its range covers. As such, its redundancy will never be high relative to more widely distributed species. Historical trends in the area have further reduced redundancy for Panama City crayfish, as its geographic extent and habitat area have both been shrunk by development, further decreasing the likelihood that a single population of Panama City crayfish will find refuge during a catastrophe and survive.

Due to small, isolated populations with low genetic diversity and high rates of inbreeding, we estimate that the Panama City crayfish currently has low adaptive potential across its small range. As inbreeding can drive a population to extinction regardless of other variables, we should consider the possibility that some Panama City crayfish populations

are already in an extinction vortex due to an ongoing loss of genetic diversity.

Summary of Comments and Recommendations

In the January 3, 2018, and April 15, 2021, proposed rules (83 FR 330 and 86 FR 19838, respectively), we requested that all interested parties submit written comments. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposed rules. Newspaper notices inviting general public comment were published in the legal notice section of The News Herald on December 31, 2017, and April 24, 2021. On February 22, 2018, we held a public meeting for the proposed listing, and on May 4, 2021, we held a virtual public informational meeting and public hearing for the reopening of the comment period on the January 3, 2018, proposed listing, as well as the proposed 4(d) rule and critical habitat designation. All substantive information received during both comment periods has either been incorporated directly into this final determination or is addressed below.

Peer Reviewer Comments

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 review from nine experts regarding version 1.1 of the SSA report, and four experts regarding version 2.0 of

the SSA report. We received responses from four experts for each version (total of eight peer reviews).

We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the information contained in the SSA report. The peer reviewers generally concurred with our methods and conclusions, and they provided additional information, clarifications, and suggestions to improve the SSA report. Peer reviewer comments are addressed in the following summary and were incorporated into the SSA report as appropriate.

(1) *Comment:* Peer reviewers of version 1.1 of the SSA report recommended modifications to the habitat ranking analysis, suggested dropping the use of crayfish counts as a proxy for relative abundance, and suggested adding genetics information.

Our response: Version 2.0 of the SSA report reflects changes suggested by peer reviewers (summarized in Appendix IV of the SSA report (Service 2019, p. 112)). We replaced abundance as a population factor with a principal components analysis (*i.e.*, an exploratory data analysis used for making predictive models) from the genetics study (Duncan et al. 2017, entire; Service 2019, p. 63).

Comments From States

(2) *Comment:* The Florida Fish and Wildlife Conservation Commission (FWC) provided several comments, suggesting revisions to version 1.0 of the SSA report. Specifically, similar to the peer review comment about crayfish counts as proxy for relative abundance, FWC emphasized that the surveys conducted by FWC were intended to determine Panama City crayfish presence at a site and not a population size, and suggested that catch per unit of survey effort would yield better comparative information between populations. In addition, FWC recommended the Service clarify that, with the exception of the infiltration into a small portion of the Panama City crayfish's range by the hatchet crayfish (*Procambarus kilbyi*) and the jackknife crayfish (*P. hubbelli*), the most frequent crayfish species found co-occurring in the same habitat (and within the water column) with the Panama City crayfish is the stud crayfish (*P. pycnogonopodus*). FWC also pointed out some minor errors regarding generation time calculations and suggested edits to the presentation of the 2030 scenario in Tables 5.3, 5.4, and 5.5 (Service 2017a, pp. 87–94).

Our response: The SSA report was revised (Service 2019, version 2.0) to

reflect these suggested changes. We did not intend to confuse population presence with that of relative abundance but believed that abundance numbers could be used as an indicator of the resiliency of populations. In the revised SSA report (Service 2019, version 2.0), we removed abundance as a criterion used to rank resiliency of the crayfish populations. Further, using the Act's section 6 funds and a staff position provided by FWC, we have attempted to gather mark-recapture data in the field to estimate population size and the factors that affect detection probability. We continue to work with FWC biologists to develop a monitoring plan that accurately assesses population trends or estimates.

(3) *Comment:* FWC staff concurred with the proposed take exceptions described in our proposed 4(d) rule, but they also recommended that we consider an exception to the take prohibitions for emergency actions to relieve flooding.

Our response: The 4(d) rule for the Panama City crayfish that we are adopting in this final rule excepts incidental take associated with ditch mowing and maintenance actions that may be necessary to relieve flooding when following best management practices (BMPs) that have been coordinated with the Service.

Public Comments

(4) *Comment:* Several commenters state that listing the Panama City crayfish will hurt the local economy by delaying the growth and development of infrastructure that is needed for the community. These commenters are therefore opposed to listing the Panama City crayfish. They stated we have not adequately addressed the economic impacts of listing the Panama City crayfish as required by Florida law.

Our response: Determinations of whether a species is placed on the Federal List of Endangered and Threatened Wildlife and Plants are based on whether the species meets the definition of “endangered species” or of “threatened species” in the Act (16 U.S.C. 1531 *et seq.*). The Act directs the Service to make these determinations solely on the basis of the best scientific and commercial data available. Therefore, we may not consider economic impacts when determining the status of a species. We do consider economic impacts when designating critical habitat (see *Consideration of Economic Impacts*, below).

Additionally, infrastructure and growth are not prohibited by this rule. The Service developed a 4(d) rule for the Panama City crayfish to streamline

the permitting process by excepting certain actions from the take prohibitions. For example, residents who want to install sheds, driveways, or pools likely will not need a permit from the Service. The 4(d) rule allows streamlining of project reviews to focus on those activities that are expected to have the most potential impact to the Panama City crayfish or its habitat, thus reducing staff workload by eliminating the need to review *de minimus* impact projects and enabling more focus on targeted conservation efforts that are expected to have the most benefit to the species.

(5) *Comment:* One commenter suggested that protecting and managing 2,200 acres in perpetuity, with 3-year rotational prescribed burns and other management activities, will cost approximately \$20 million and is not feasible. They questioned the overall conservation strategy and expressed concern about whether perpetual maintenance would be required in conservation areas and how that maintenance would be funded.

Our response: The conservation strategy identifies goals that may need to be met in order to ensure recovery of the Panama City crayfish and states that a minimum viable population size (MVP) for Panama City crayfish of 5,137 individuals and 2,200 acres of actively managed habitat across the range that is permanently protected and managed across at least seven population units should ensure the Panama City crayfish maintains viability for the future. In order to accomplish this goal, Bay County staff worked with the Florida Department of Environmental Protection (FDEP) to place optimal lands on the Florida Forever Land acquisition list. Placement on the Florida Forever list will allow future expenditures of State funds to purchase lands important for the protection of the Panama City crayfish when funds and ranking priorities are aligned, and will place them in permanent conservation or into State of Florida ownership to enable perpetual maintenance for the species. Federal grants are also available via the Recovery and Land Acquisition grants program. Lastly, minimization and mitigation through the Act's section 7 process provide another mechanism to achieve conservation actions such as habitat protection.

(6) *Comment:* One commenter expressed concerns that all known techniques to measure Panama City crayfish populations are harmful to the crayfish and will invariably lead to population extirpations. Another commenter stated that the crayfish

cannot be positively identified without a postmortem examination.

Our response: The FWC and Service biologists regularly collect samples of the Panama City crayfish to confirm presence and for genetic testing. We conduct crayfish captures by use of a dip net or by placement of funnel traps. Each time, crayfish are captured, they are counted, measured, and released alive. Rarely are they injured, and more rarely are they killed with either trapping method used. Crayfish can easily be identified by trained biologists from their physical characteristics and location of collection. At newly discovered sites, a voucher specimen of a male in breeding phase is confirmed by a species expert and preserved for future reference.

(7) *Comment:* One commenter requested that any final rule promulgated by the Service clarify that the total habitat available to the Panama City crayfish is the 56 square-mile area identified in Figure 1 of the January 3, 2018, proposed rule (see 83 FR 333) and that Callaway Creek and Bayou George Creek form an absolute barrier to any eastward expansion by the crayfish.

Our response: The Service has taken the range description from the SSA report and used it in this final rule. We, with assistance from the FWC, have projected boundaries based on existing survey data. To our knowledge, Callaway Creek and Bayou George Creek form barriers and restrict access by the Panama City crayfish on opposite creek or stream banks. However, the northeastern portion of the species' range is not bordered by any well-defined water body, and the current delineator is only defined by the locations of the Panama City crayfish identified during surveys where access was allowed by the landowner. Thus, some uncertainty remains with respect to the boundaries in the northeastern-most habitats. Accordingly, we cannot state Callaway Creek and Bayou George are absolute barriers to eastward expansion.

(8) *Comment:* One commenter claimed that the eastern side of the Panama City crayfish's range has been surveyed more than the western side of the range. Another commenter stated that we have insufficient data regarding the Panama City crayfish to prove a decline in the species. Both commenters encouraged the Service to conduct more surveys within the western portion of the range.

Our response: Survey effort varies across the species' range. Survey access is limited by landowner permission, so the majority of surveys occur only where we received landowner

permission to access their land or along public rights-of-way. We agree that additional surveys within the western range of the species would assist with our understanding of the species' distribution. As access is allowed, we will continue to fill in survey gaps. Despite these potential survey gaps, the Act requires us to make a listing determination based on the best available information. Using current data and our knowledge of the Panama City crayfish's habitat use, we are able to define where populations of the species may occur. Overlaying these areas with land use layers, we used Geographic Information System (GIS) mapping to refine areas that remain suitable for the species and compared it to past habitat availability. From this analysis, we found that approximately 50 percent of the remaining habitat is potentially suitable for the species. Because of the known relationship between the crayfish and its habitat, we can make inferences that declines of the crayfish have occurred based on loss of habitat to development.

(9) *Comment:* One commenter expressed concern that the Service may allow destruction of mature hardwood swamp vegetation and mature baygall communities as a method to create new habitat for the Panama City crayfish.

Our response: On lands that may be secured for Panama City crayfish protection, we do not intend to alter natural communities such as mature hardwood swamps or baygall communities to benefit the Panama City crayfish. Fire historically sculpted the ecosystem boundaries of the species, but with limitations in developing city boundaries on where prescribed fires may be implemented, the ecotones between differing habitat types may not be as clear as they were historically when wildfires burned unimpeded. There are often differing viewpoints among ecologists on what habitat type a specific area historically was intended to function as; however, we consult with habitat experts and review literature before removal of certain plant species to encourage growth of other plant species.

(10) *Comment:* One commenter stated that it has yet to be determined whether Panama City crayfish is a native species.

Our response: Based on the best available data, the species is considered to be a valid species native to Bay County, Florida (Taylor et al. 2007; Integrated Taxonomic Information System 2017; Service 2019, p. 12).

(11) *Comment:* One commenter questioned whether critical habitat should be extended to the remaining 30 percent of the lands that do not contain

the preferred hydric soils, because there is evidence that juvenile crayfish are transported overland by sheet flow rains. Any alteration in the upland landscape (driveway, building) could create an impediment to this sheet flow and therefore create an impediment to crayfish survival.

Our response: We agree that crayfish are likely dispersed via sheet flow during heavy rain events. However, because these areas are not used consistently either on a per-event basis or by a specific lifestage, and do not provide features (such as core, hydric soils) that are essential to the species' conservation, we have not included these soil types in our critical habitat designation. Connectivity of conservation parcels that have been designated as critical habitat and are consistent with our conservation strategy will further allow for natural dispersal events via sheet flow.

(12) *Comment:* Commenters noted that the Panama City crayfish is already protected by the State of Florida and expressed concern about the potential for unnecessary regulatory duplication should the Service finalize the listing of the Panama City crayfish. They requested that entities only need to coordinate with one agency.

Our response: We have determined that the Panama City crayfish warrants listing as a threatened species, despite existing State protections. With the intent to streamline the regulatory process, in January 2020, FDEP assumed permitting authority under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) for dredge and fill activities throughout Florida, including within the range of the Panama City crayfish. FDEP is required to coordinate with us prior to authorizing permits for species listed under the Act, species proposed for listing under the Act, candidate species, and species petitioned for listing under the Act. We support minimizing the regulatory burden on the public, while also ensuring the conservation of the species. Through the FDEP assumption of permitting authorities, entities will deal directly with one process that will cover all permits, thereby simplifying the consultation process for applicants.

(13) *Comment:* One commenter expressed concern with the continuing status quo for development projects that do not require Federal permits, citing that State and local protections for the species are inadequate as demonstrated by the species' continuing decline.

Our response: Our 4(d) rule extends the prohibitions of section 9 of the Act to the Panama City crayfish, with certain exceptions. Projects or actions

that are likely to cause take of the Panama City crayfish but that are not subject to section 7 review under the Act will require a permit and habitat conservation plan (HCP) under section 10 of the Act, unless they otherwise qualify for an exception in the 4(d) rule.

(14) Comment: One commenter expressed concern that spraying for mosquitos will be prohibited to prevent pesticide drift into protected habitat, and, therefore, Panama City crayfish will be prioritized over the health of Bay County residents with respect to mosquito-borne illnesses.

Our response: We encourage the use of mosquito control methods that do not result in take of the species. Mosquito control often uses pyrethroid insecticide, which has been shown to be toxic to aquatic wildlife (Paul and Simonin 2006, p. 614). There are alternative methods to control mosquitos other than through the use of aerial pesticide applications, such as donut blocks placed directly into neighborhood ditches that prevent the larvae from maturing to adult mosquitos. We encourage alternative applications that are not detrimental to the Panama City crayfish.

(15) Comment: One commenter noted that Panama City crayfish habitat will create additional mosquito breeding areas.

Our response: We do not agree; protecting habitat for the Panama City crayfish will not alter the amount of standing water that exists in the environment today. Restoration actions may reduce the amount of water standing in furrowed habitats and normalize the water table. The Panama City crayfish prefers ephemeral pools of water less than a foot deep. The Panama City crayfish feeds mostly on decaying vegetation, but as generalist feeders, they are likely to feed on mosquito larvae, too.

(16) Comment: One commenter requested that the Service list the Panama City crayfish as endangered instead of threatened. They cite endangered ranks from the International Union for the Conservation of Nature (IUCN) and the American Fisheries Society (AFS).

Our response: The definitions, criteria, and analyses under the Act are not equivalent to those used by IUCN and other organizations. The Act defines “endangered species” and “threatened species” and mandates five factors for consideration when determining a species’ status under the Act. The definitions and analysis conducted under the Act do not necessarily equate with those used by other organizations who have different ranking systems,

and, accordingly, a species’ status may vary depending on the source. As noted, we are required to apply the definitions of the Act and consider the factors the Act identifies. We have determined that endangered species status under the Act is not appropriate for the Panama City crayfish because the species maintains multiple, moderate or high resiliency populations across its historical range, with low risk of significantly declining in the near term. Further, given its distribution and health of populations, the Panama City crayfish has sufficient redundancy and representation to withstand catastrophic events and novel changes in its environment in the near term. For these reasons, Panama City crayfish is not currently in danger of extinction. See Determination of Panama City Crayfish’s Status, below.

(17) Comment: Several commenters had questions about the buffer width used to delineate critical habitat. One commenter questioned the percentage of Panama City crayfish documented on core soils. One commenter asserted existing forestry BMPs in Florida and biodiversity standards in forest certification programs are effective for protecting at-risk species, regardless of buffer width.

Our Response: As described in the Summary of Changes from the Proposed Rule and the Criteria Used to Identify Critical Habitat sections of this rule, we have modified the buffer width based on additional analysis of Panama City crayfish occupancy of secondary soils. We reduced the buffer to 50 feet rather than the proposed 328 feet. Our original analysis conducted for the April 15, 2021, proposed rule (86 FR 19838) used a 328-foot buffer from core soils into secondary soils, which captured 96 percent of known occurrence records. Later in 2021, we looked at varying scales relative to presence points. Using a 50-foot buffer from the core soils’ boundary line into secondary soils, we capture close to 71 percent of known occurrence records. Based on our knowledge of how the crayfish moves across the landscape, it is likely that the additional occurrence records may have been from points in time where there was high rainfall, however we lack recorded rainfall amounts or ground water levels to confirm this assumption. We have determined that the 50-foot buffer provides a better method to focus protection on lands that are likely occupied more consistently, rather than those that may only be temporarily occupied during months or years with high rainfall events. Therefore, this final rule includes the refined 50-foot buffer boundary to capture lands used most consistently versus lands that may be

used only during a small portion of the crayfish’s life cycle when there is high rainfall. We include an exception for forestry BMPs in secondary soils as part of our 4(d) rule because forestry practices that follow BMPs in secondary soils will have *de minimus* impacts on the species.

(18) Comment: Several commenters focused on concerns that private landowners will need to hire consultants and pay for mitigation for activities on their properties. Concerns were expressed over the potential loss of use or value of their property, and these commenters requested that all landowners in the proposed critical habitat units be notified about the proposed listing and critical habitat rule.

Our response: As described under *Takings—Executive Order 12630*, below, the Act does not authorize the Service to regulate private actions on private lands 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. Accordingly, any potential impact to land value results from perceptions and is expected to be small.

We placed notifications in the local newspaper informing the public of the proposed rule, and we held two public informational meetings and one public hearing. In general, a 4(d) rule allows the Service to target the take prohibitions to those that provide conservation benefits for a threatened species; we may choose to except take for certain activities (*i.e.*, allow incidental take without a permit for certain activities) if we conclude the exceptions are necessary and advisable to provide for the conservation of the species. For this species’ 4(d) rule, one exception removes permit requirements with respect to the following activities for individual homeowners: Maintenance of existing structures and construction or reconstruction activities that occur within the existing footprint of previously developed areas; construction of new structures that occur within 100 feet of existing structures on an individual private landowner’s property and with a new footprint less than 1,000 square feet (ft²), such as a pool or shed associated

with an existing house; and culvert installations for individual landowners not associated with larger developments. Therefore, small (*i.e.*, individual home) landowners will not need to hire consultants or pay for mitigation for activities on their properties.

(19) *Comment:* One commenter expressed concern that only occupied habitat is included in the critical habitat designation and indicated that more areas are needed in the designation to meet the resilience, redundancy, and representation under which the Service evaluates requirements of the Act.

Our response: It appears that the commenter may be confusing our use of the conservation biology principles of resiliency, redundancy, and representation (*i.e.*, the 3Rs) in the SSA report and how we identify areas that meet the definition of critical habitat under section 3(5)(A) of the Act. We are designating more than 4,000 acres of land, all considered occupied, as critical habitat. In addition, our analysis of land needed to recover the species is a subset of the currently occupied habitat rather than all, as reflected in this final designation. We did not find that unoccupied habitat should be designated, as no other habitat was deemed essential to the conservation of the species. Based on occupied critical habitat, the species maintains multiple, adequately resilient populations across its historical range, with low risk of significantly declining in the near term. Further, given its distribution and the health of its populations, the Panama City crayfish has sufficient redundancy and representation to withstand catastrophic events and novel changes in its environment in the near term. Accordingly, we determined occupied critical habitat is sufficient to conserve the species.

(20) *Comment:* Two commenters expressed concerns with proposing a 4(d) rule that would allow activities, such as sustainable silvicultural practices, that do not have positive effects on the Panama City crayfish.

Our response: Section 4(d) of the Act provides the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of a threatened species. Under section 4(d) of the Act, we may extend some or all of the prohibitions of section 9(a)(1) of the Act to threatened wildlife species. In considering whether to extend the section 9(a)(1) prohibitions, we may consider whether the benefits of allowing certain activities, including habitat management activities and some silvicultural practices when

implemented with conservation measures to reduce impacts, are expected to have overall *de minimus* impacts or be beneficial to the species such that prohibiting those activities or take associated with those activities may be unnecessary. One example is reduced bedding depths used during silvicultural activities. Silvicultural row thinning increases groundcover that is beneficial to the Panama City crayfish. The 4(d) rule exceptions will allow us to streamline routine actions that have minimal impacts or benefits to the crayfish, especially when implemented with conservation measures, by excepting the take associated with them.

(21) *Comment:* One commenter stated that they are unaware of any ranching or farming uses that have resulted in the loss or degradation of the Panama City crayfish's natural habitat. They disagreed with the statement, "conversion from silviculture to grazing use has occurred on lands adjacent the crayfish's range." They are also unaware of any plans to convert any land to ranching or farming uses in the crayfish's range. The commenter stated that land conversion to ranching and or farming is simply not an issue, and that these activities may provide an overall benefit to the crayfish through the creation of artificial habitat. The commenter, therefore, requested that the Service remove the statements associated with the potential for ranching and farming uses to impact the Panama City crayfish's habitat. This commenter also supported use of the 4(d) rule for all activities, such as agriculture, if water quality BMPs are followed.

Our response: On the few individual family farms and ranches that occur within the range of the crayfish, little habitat remains that is suitable for the crayfish. These properties lack sufficient herbaceous vegetation and have muddied and compacted soils. The 4(d) rule includes an incidental take exception for agricultural maintenance activities in pasture and rangelands (including cattle operations) that were established prior to January 3, 2018, and that implement State and Federal BMPs for existing farms and ranches if they have no indirect impacts to adjacent Panama City crayfish habitat. The Service agrees that no corporate-scale ranching or farming of lands currently occurs within the Panama City crayfish's range. We clarify that currently the closest large-scale ranching is more than 5 miles from the eastern border of the species' range. However, we have concerns with future corporate-scale ranching or farming of lands that might occur within the range

of the Panama City crayfish. Current practices for these operations often include conversion of the groundcover to a nonnative grass cover, which is not suitable for the crayfish.

(22) *Comment:* One commenter stated that the 4(d) rule should include exceptions for take associated with conservation management practices for a suite of activities that occur in Panama City crayfish habitat, including maintenance of ditches, roads, and utility and transmission line rights-of-way, and an exception for entities using water quality BMPs for silviculture and agriculture.

Our response: As described under Provisions of the 4(d) Rule, below, we provide exceptions for take associated with certain development practices, select land management activities, and some utility actions that are expected to have negligible impacts to the Panama City crayfish and its habitat.

(23) *Comment:* One commenter requested revising the 4(d) rule to remove the limitation of excepting take only if it is associated with forestry activities "located in secondary soils."

Our response: Because of the close association of the Panama City crayfish to core soils, and the species' need for intact, unaltered core soils, we are not excepting take associated with forestry practices in core soils. As indicated in the SSA report, silvicultural practices such as ditching and bedding, roller chopping, installing fire breaks, and constructing roads can alter the hydrology of Panama City crayfish sites, create physical barriers to Panama City crayfish movement, and destroy underground burrows (Service 2019, p. 67). Fire suppression and high tree-density on silvicultural sites reduce or eliminate herbaceous groundcover necessary for suitable crayfish habitat (Service 2019, p. 67). For these reasons, we are not excepting incidental take associated with activities employing forestry BMPs on core soils; however, we do provide the exception for incidental take associated with these activities on secondary soils because the soils are less hydric, so ditching and bedding is greatly reduced thereby likely reducing the effects to a *de minimus* level for the Panama City crayfish.

(24) *Comment:* One commenter stated that any level of take allowed by the 4(d) rule will lead to the extinction of the Panama City crayfish and requested that all incidental take exceptions be removed from the 4(d) rule.

Our response: Small, isolated pockets of Panama City crayfish occurrences located within individual homeowners' backyards do not contribute

significantly to the overall recovery of the species, therefore incidental take for specified activities in these small pockets of habitat is warranted. The exceptions detailed in the 4(d) rule target activities that will have minimal impacts on populations of Panama City crayfish and the species' recovery; therefore, we found that the exceptions are necessary and advisable for the conservation of the crayfish.

Determination of Panama City Crayfish's Status

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

Status Throughout All of Its Range

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Panama City crayfish. Our analysis of this information indicates that, at the species level, habitat loss, degradation, and fragmentation due to human development (Factor A) is the primary factor affecting the Panama City crayfish now and into the future. There may be additional infrastructure projects (*e.g.*, roads and ditches) that affect the hydrology within the range of the Panama City crayfish as a result of forest clearing for permanent rights-of-way or silviculture. Additionally, the current level of habitat fragmentation (Factor A) further isolates populations, which reduces gene flow and limits the potential for the species to disperse. The existing regulatory mechanisms (Factor D) do not address these threats to the level that the species is not warranted for listing. We have no evidence that off-

road vehicle use (Factor A), overutilization (Factor B), or disease (Factor C) are affecting populations of Panama City crayfish.

We find that an endangered species status is not appropriate for the Panama City crayfish because despite its narrow and isolated distribution making it susceptible to catastrophic events and having low adaptive ability, the species maintains multiple resilient populations across its historical range and the risk of extinction is low in the near term. While only 43 percent of the original lands historically available to the Panama City crayfish remain suitable for use by the Panama City crayfish, the species currently has four highly or moderately resilient populations. Further, despite changes to the crayfish's natural habitat of wet pine flatwoods, the species currently uses artificial habitats such as roadside ditches and rights-of-way, although these sites may become unsuitable in the long term due to anthropogenic activities that can alter their hydrology or configuration. Therefore, we conclude that the current risk of extinction of the Panama City crayfish is sufficiently low that it does not meet the Act's definition of an endangered species.

In determining whether Panama City crayfish is likely to become endangered in the foreseeable future, we assessed the plausible scenarios, including the scope and magnitude of threats and the expected species' response to these changes. The foreseeable future is the period of time for which we determined we could make reliable predictions about the threats to the species and the species' response to those threats. Based on the biology of the species and the threats acting on it, the foreseeable future timeframe used in the determination is approximately 30 years. The generation time for the species is 2 years with a lifespan up to 3.5 years; the period to 30 years encompasses up to 15 generations, which is sufficient time to determine the species' response to the stressors. During this timeframe, we determined we can make reliable predictions about the threats to the species and the species' response to those threats. Although the future scenarios extend through 2070, the uncertainty regarding the species' response to the stressors becomes so great as to render the scenarios too unreliable beyond 2050.

While the Panama City crayfish faces a variety of threats, only one threat, habitat loss and degradation due to urban development causing habitat fragmentation and subpopulation isolation, was considered an important factor in our assessment of the future

viability of the Panama City crayfish. Based on our future scenarios for urban development, we projected losses of resiliency, representation, and redundancy for Panama City crayfish in the foreseeable future. Especially problematic is the projected complete loss of resiliency and redundancy in the western group of populations. Losses of western Panama City crayfish populations substantially reduce the range and genetic diversity of the species, as well as increasing vulnerability to catastrophic events such as hurricanes. The current circumstances are already precarious, and the loss of any more adequately resilient populations would put the species in danger of extinction.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Panama City crayfish. Habitat loss from development is occurring rangewide and has resulted in the fragmentation of the landscape. The fragmentation of suitable habitat has caused the isolation of existing populations, limiting them to ditches, swales, slash pine plantations, and utility rights-of-way. The Panama City crayfish has been fragmented into 12 smaller populations. In the future, two populations are projected to maintain high resiliency, one moderate resiliency, and six low resiliency, while three will be considered functionally extirpated.

Of the eight western populations, six populations are projected to be in low condition and three are functionally extirpated in the future. These three functionally extirpated populations represent 25 percent of the known populations overall and 38 percent of the western group, and, although still in existence, they are not expected to contribute to the future redundancy of Panama City crayfish because they are already experiencing genetic drift and the habitat that supports them is susceptible to future development.

All future scenarios project a similar negative impact on the redundancy and representation of Panama City crayfish, with three populations projected to be extirpated, and of the remaining nine populations, six will be in low condition by 2030 under all scenarios. The greatest loss of redundancy for the Panama City crayfish is projected to occur in the western group. In this group, all of the populations are predicted to be extirpated or in low condition by 2030, including the Transmitter West population, which is the largest population in this group. Loss of viability within this population is significant for the species. In the eastern group, three populations are

projected to remain strongholds for Panama City crayfish. These three eastern populations will maintain resiliency and constitute only 33 percent of the remaining populations.

The Panama City crayfish currently has low adaptive potential across its range, and all of the future scenarios project an impact on the species' representation during the 30-year foreseeable future time horizon. The species has very low resiliency in the western portion of its range, with only one of the eight populations currently in moderate condition. None of the western populations are projected to maintain adequate resiliency in the future; thus, adaptive capacity is projected to be completely lost in the western portion. Furthermore, a population (High Point) in the eastern portion contains unique genetic diversity not found in other populations (Duncan et al. 2017a, p. 19), but it is expected to remain in low condition and thus has a low likelihood of persistence, thereby further reducing the species' ability to adapt to changes in its environment.

Thus, after assessing the best available information, and based on analysis of the species' current and future conditions, we conclude that the resiliency, representation, and redundancy for the Panama City crayfish will continue to decline such that it is likely to become in danger of extinction within the foreseeable future throughout its range.

Panama City Crayfish's Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity v. Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020) (*Center for Biological Diversity*), vacated the aspect of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014) that provided that the Service does not undertake an analysis of significant portions of a species' range if the species warrants listing as threatened throughout all of its range. Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant, and (2) the species is in

danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the "significance" question or the "status" question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

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

For the Panama City crayfish, we considered whether the threats are geographically concentrated in any portion of the species' range at a biologically meaningful scale. We examined the following threats: Habitat loss and degradation from development, including cumulative effects. The threat from development and future urbanization of the landscape in Bay County, Florida, affects the species throughout its entire narrow range. The species is a narrow endemic that historically functioned as a single population occurring in a very small area, and has since been fragmented into multiple small populations divided into western and eastern groupings based on a road. While we can separate the species' range into western and eastern portions, the threats that the species faces, particularly development and subsequent isolation and lack of connectivity, affect the species throughout its entire narrow range. Therefore, there is no concentration of threats in any portion of the Panama City crayfish's range at a biologically meaningful scale, and accordingly, there are no portions of the species' range where the species is likely to have a different status from its rangewide status. Thus, no portion of the species' range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This is consistent with the courts' holdings in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018),

and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

Determination of Status

Our review of the best available scientific and commercial information indicates that the Panama City crayfish meets the Act's definition of a threatened species. Therefore, we are listing the Panama City crayfish as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

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

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning 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 from endangered to threatened

(“downlisting”) or removal from protected status (“delisting”), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our ECOS portal (<https://www.fws.gov/ecos>), or from our Florida 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.

Following publication of this final rule, 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 Florida will be eligible for Federal funds to implement management actions that promote the protection or recovery of the Panama City crayfish. Information on our grant programs that are available to aid species recovery can be found at: <https://www.fws.gov/grants>.

Please let us know if you are interested in participating in recovery efforts for the Panama City crayfish. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is 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 to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands; issuance of section 404 Clean Water Act permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

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

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

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as threatened. The U.S. Supreme Court has noted that statutory language like “necessary and advisable” demonstrates a large degree of deference to the agency (see *Webster v. Doe*, 486 U.S. 592 (1988)). Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. Thus, the combination of the two sentences of section 4(d) provides

the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of the threatened species. The second sentence grants particularly broad discretion to the Service when adopting the prohibitions under section 9.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld rules developed under section 4(d) as a valid exercise of agency authority where they prohibited take of threatened wildlife, or include a limited taking prohibition (see *Alsea Valley Alliance v. Lautenbacher*, 2007 U.S. Dist. Lexis 60203 (D. Or. 2007); *Washington Environmental Council v. National Marine Fisheries Service*, 2002 U.S. Dist. Lexis 5432 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana v. Verity*, 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, “once an animal is on the threatened list, the Secretary has an almost infinite number of options available to him [or her] with regard to the permitted activities for those species. He [or she] may, for example, permit taking, but not importation of such species, or he [or she] may choose to forbid both taking and importation but allow the transportation of such species” (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

Exercising the authority under section 4(d), we have developed a rule that is designed to address the Panama City crayfish's specific threats and conservation needs. Although the statute does not require us to make a “necessary and advisable” finding with respect to the adoption of specific prohibitions under section 9, we find that this rule as a whole satisfies the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the Panama City crayfish. As discussed above under Summary of Biological Status and Threats, we have concluded that the Panama City crayfish is likely to become in danger of extinction within the foreseeable future primarily due to habitat loss and degradation, habitat fragmentation, and subpopulation isolation due to development.

The provisions of this 4(d) rule will promote conservation of the Panama City crayfish by encouraging management of the landscape in ways that meet the conservation needs of the

Panama City crayfish and are consistent with land management considerations. The provisions of this rule are one of many tools that the Service will use to promote the conservation of the Panama City crayfish.

Provisions of the 4(d) Rule

This 4(d) rule will provide for the conservation of the Panama City crayfish by prohibiting the following activities, except as otherwise authorized or permitted: Importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce.

Multiple factors are affecting the status of the Panama City crayfish, with the primary threats resulting in habitat loss and degradation, habitat fragmentation, and population isolation. A range of activities have the potential to affect these species, including farming and grazing practices, some silvicultural practices, creation and maintenance of roadside ditches and rights-of-way, development of residential or commercial properties, and collection for bait (Service 2019, pp. 65–66). These threats, which are expected to be exacerbated by continued development along with the effects of climate change, were central to our assessment of the future viability of the Panama City crayfish. As a result, we are prohibiting take associated with these threats to conserve the species unless they are managed in such a way that results in minor take. Further, import or export, sale, and possession are all activities that could be associated with bait collection and, therefore, are prohibited.

Under the Act, “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulation at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Regulating incidental and intentional take will help preserve the species’ remaining populations, slow their rate of decline, and decrease synergistic, negative effects from other stressors. Therefore, we prohibit intentional and incidental take of the Panama City crayfish, except that take associated with those actions and activities discussed below is specifically excepted by the 4(d) rule.

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: For scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

The 4(d) rule will also provide for the conservation of the species by allowing exceptions to actions and activities that, while they may have some minimal level of disturbance or take to the Panama City crayfish, are not expected to rise to the level that would negatively impact the species’ conservation and recovery efforts. The exceptions to these prohibitions include conservation efforts by the Service or State wildlife agencies; certain other general exceptions allowed for take of endangered wildlife as set forth in 50 CFR 17.21 (see the rule portion of this document); and certain development practices, select land management activities, and some utility actions (described below) that are expected to have negligible impacts to the Panama City crayfish and its habitat.

The first exception is for take associated with certain development activities that will have negligible or beneficial effects on the Panama City crayfish and its habitat, including: Maintenance of existing structures and construction or reconstruction activities that occur within the existing footprint of previously developed areas; construction of new structures that occur within 100 feet of existing structures on an individual private landowner’s property and have a new footprint less than 1,000 square feet (ft²), such as a pool or shed associated with an existing house; installation of culverts for individual landowners not associated with larger developments; installation of platforms or boardwalks for recreational purposes on conservation lands that allow sunlight of sufficient levels to maintain herbaceous groundcover; and construction of paths used for nonmotorized activities as long as the project footprint, including construction impacts, impacts no more than 5 percent of the acreage in core or secondary soils within properties under a conservation easement.

The second exception is for take associated with select land management

activities related to silvicultural (forestry) activities and invasive species control that help maintain habitat for the Panama City crayfish and to agricultural maintenance activities, and that have *de minimus* effects. Silviculture activities within secondary soils including tree thinning, harvest (including clearcutting), site preparation, planting, and replanting following State BMPs (Florida Department of Agriculture and Consumer Services (FDACS) 2008, entire) are excepted as the species has remained viable in lands under timber management where native groundcover species recolonize naturally. As a practice, ditching and bedding from forestry occurs less often in secondary soils than in primary soils, and therefore is considered to have *de minimus* effects. Take associated with prescribed burning and wildfire control efforts is excepted when following all State BMPs, guidelines, or permit conditions, and take associated with herbicide applications targeting exotic plants or shrub species is excepted when following all other State and Federal BMPs, guidelines, or permit conditions, associated with these actions. Finally, take associated with agricultural maintenance activities in pasture and rangelands (including cattle operations) that were established prior to publication of the proposed listing rule (January 3, 2018) and that implement State and Federal BMPs will be excepted.

The third exception is for take associated with some utility actions that are expected to have minimal impacts to the Panama City crayfish or its habitat. These include ditch mowing and maintenance activities outside of critical habitat units, or ditch mowing and maintenance within critical habitat units after development of BMPs in coordination with the local Service office. Take associated with culvert replacements or maintenance that do not adversely affect, but improve or restore, the natural hydrology is excepted. In coordination with the local Service office, take associated with the following activities is also excepted: Maintenance associated with rights-of-way (including mowing, use of herbicides, and mechanical side trimming); powerline and pole placements and replacements; replacement of critical structural components, such as crossarms, insulators, conductors, etc.; and directional boring by utility owners.

We reiterate that these actions and activities may have some minimal level of take of the Panama City crayfish, but any such take is expected to be rare and

insignificant, and is not expected to negatively impact the species' conservation and recovery efforts. We expect the restoration activities to have a net beneficial effect on the species. Across the species' range, habitat has been degraded and fragmented by development and land use changes. The habitat restoration activities in the 4(d) rule are intended to improve habitat conditions for the species in the long term.

We recognize our special and unique relationship with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist the Services in implementing all aspects of the Act. In this regard, section 6 of the Act provides that the Services shall cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, will be able to conduct activities designed to conserve the Panama City crayfish that may result in otherwise prohibited take without additional authorization. In addition, Federal and State wildlife law enforcement officers, working in coordination with Service field office personnel, may possess, deliver, carry, transport, or ship Panama City crayfish taken in violation of the Act as necessary.

Nothing in this 4(d) rule will change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the Panama City crayfish. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between Federal agencies and the Service.

III. Critical Habitat

Background

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

(1) The specific areas within the geographical area occupied by the

species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

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

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

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

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

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Designation also does not allow the government or public to access private lands, nor does designation require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the Federal agency will be required to consult with the Service under section 7(a)(2) of the Act.

However, even if the Service were to conclude that the proposed activity would result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement "reasonable and prudent alternatives" to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical or biological features that occur in specific occupied areas, we focus on the specific features that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity.

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. The implementing regulations at 50 CFR 424.12(b)(2) further delineate unoccupied critical habitat by setting out three specific parameters: (1) When designating critical habitat, the Secretary will first evaluate areas occupied by the species; (2) the Secretary will only consider unoccupied areas to be essential where a critical habitat designation limited to geographical areas occupied by the species would be inadequate to ensure the conservation of the species; and (3) for an unoccupied area to be considered essential, the Secretary must determine

that there is a reasonable certainty both that the area will contribute to the conservation of the species and that the area contains one or more of those physical or biological features essential to the conservation of the species.

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

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

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the

continued existence of any endangered or threatened species; and (3) the prohibitions found in section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of the species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of those planning efforts calls for a different outcome.

Physical or Biological Features Essential to the Conservation of the Species

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

of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

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

(1) Space for individual and population growth and for normal behavior: The Panama City crayfish naturally inhabits shallow, ephemeral, freshwater wetlands that are associated with early successional wet prairie-marsh and wet pine flatwoods and their communities. These locations historically supported a native herbaceous plant community dominated by native wetland grasses and sedges with an accompanying overstory of no to low-density pines and were naturally maintained by periodic wildfire.

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements: Native herbaceous vegetation is important to the Panama City crayfish for food, detritus formation, and shelter. Absence of vegetation increases exposure of this small crayfish to predation and reduced availability of food. Although Panama City crayfish are facultative air breathers, moisture is required to facilitate the respiratory process. Burrowing to groundwater or access to surface water are both important habitat features needed to prevent desiccation of individuals and populations. The Panama City crayfish cannot burrow much deeper than 3 feet below the surface and prefer surface waters less than 1 foot deep (FWC 2006, p. 3).

(3) Cover or shelter: The Panama City crayfish relies mostly on herbaceous vegetation that grow on core and secondary soils, which allow them to burrow for shelter and to rear young. The ability to burrow to the water table during times of drought is essential to the persistence of the species. Core soils have depth to water tables that meet the depth threshold that is important for long-term Panama City crayfish

population persistence. These core soils provide the sediment structure needed for burrow construction to the water table and also support the herbaceous vegetation upon which the species relies for food and shelter. Young crayfish are often captured clinging to vegetation in emergent, yet shallow, water bodies.

Secondary soil types are drier, and it is believed the species cannot persist when only secondary soils are available with below-average water tables. They are mentioned here because they may support Panama City crayfish after recent rainfalls and longer periods of time after above-average rainfall that influences water table depths, and they may provide connectivity between two patches of core soils. Seventy percent of known occurrences of Panama City crayfish occur within either core soils or within secondary soils that are within 50 feet (15 m) of core soils. These secondary soils also provide the sediment structure needed for burrow construction to the water table and also support the herbaceous vegetation upon which the species relies for food and shelter except during times of drought.

(4) Sites for breeding, reproduction, or rearing (or development) of offspring: Shelters, such as burrows, are an important resource for crayfish as they provide for protection from predation and space for mating and for rearing hatchlings. Burrows also help to maintain hydration and preferred body temperatures. Surface waters provide shelter for juveniles to grow prior to being large enough to burrow. These surface water locations also provide for breeding and feeding grounds. Surface water must be sufficiently deep, but usually less than 1 foot (0.3 meters) deep, to support the species but shallow enough to sustain herbaceous vegetation. Waters greater than 1 foot (0.3 meters) deep sustain other crayfish species that may outcompete the Panama City crayfish.

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species: The Panama City crayfish's historical range is estimated to cover a 56-square-mile area (Service 2019, entire). Hardwood swamps fall within the core soil category but are not actually suitable for the Panama City crayfish (except the transition edge habitat). Land acreages within the Panama City crayfish's range total 35,658 acres, with a composition of the following soils: (1) Core with 14,880 acres (6,022 ha; 42 percent of the land area); (2) secondary with 12,379 acres (5,010 ha; 35 percent of the land area); and (3) unsuitable soils with 8,399 acres (3,399 ha; 23 percent of the land area).

We estimate that approximately 9,180 acres (3,715 ha) of core and 5,647 acres (2,285 ha) of secondary soils remain undeveloped (using 2016 data) and are therefore suitable for the Panama City crayfish. We estimate that 3,606 acres (1,459 ha) of the core (3,242 acres (1,312 ha, or 22 percent)) and secondary (364 acres (147 ha, or 3 percent)) soils are hardwood swamp, which are not directly used by the Panama City crayfish but are included within acreage totals because they provide transition habitat.

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of Panama City crayfish from studies of the species' habitat, ecology, and life history as described below. Additional information can be found in the proposed listing rule published in the **Federal Register** on January 3, 2018 (83 FR 330), and the Panama City Crayfish SSA report (version 2.0; Service 2019, entire). We have determined that the following physical or biological features are essential to the conservation of the Panama City crayfish:

(1) Undeveloped lands, including cropland, utilities rights-of-way, timberlands, and grazing lands, that support open wet pine flatwoods and wet prairie habitats that contain the following:

(a) Appropriate herbaceous groundcover vegetation;

(b) Permanent or temporary pools of shallow (usually less than 1 foot) freshwater locations; and

(c) Gently-sloped ground level swales with a 3:1 or shallower slope ratio along ecotonal or transitional areas.

(2) Soil types within undeveloped lands that provide sediment structure needed for burrow construction and that support mostly native herbaceous vegetation needed for additional food and shelter, and where the ground water is always within 3 feet of the ground surface and surface waters occur on occasion. These soil types include:

(a) Core soils for Panama City crayfish, including (note: Prefix numbers refer to map units in the Soil Survey for Bay County, Florida (U.S. Department of Agriculture (USDA) 1984, entire)): (22) Pamlico-Dorovan Complex, (29) Rutlege Sand, (32) Plummer Sand, (33) Pelham Sand, (39) Pantego Sandy Loam, and (51) Rutledge-Pamlico Complex;

(b) Secondary soils within 50 feet (15 m) of core soils: (1) Albany Sand, (12) Lee field Sand, (13) Leon Fine Sand, (31)

Osier Fine Sand, and (36) Alapaha Loamy Sand; and

(c) Soils that currently, or can eventually, support native herbaceous vegetation such as, but not limited to, wiregrass (*Aristida beyrichiana*), redroot (*Lachnanthes caroliniana*), beakrushes (*Rhynchospora* spp.), pitcher plants (*Sarracenia* spp.), sundews (*Drosera* spp.), butterworts (*Pinguicula* spp.), and lilies (*Hymenocallis* spp.).

(3) Undeveloped lands that contain surface and groundwater of sufficient quality to support all life stages of the Panama City crayfish and the herbaceous vegetation on which they rely, specifically surface waters with:

(a) Oxygen levels that range between 2 and 9 milligrams per liter;

(b) pH levels between 4.1 and 9.2; and

(c) Temperatures between 42 and 94 degrees Fahrenheit (°F) (5 and 34.4 degrees Celsius (°C)), although optimum temperatures are thought to be in the range of 68 to 79 °F (20 to 26 °C) (Butler et al. 2003).

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 this species may require special management considerations or protection to reduce the following threats: Habitat loss and destruction due to residential and commercial development, as well as habitat loss due to changes in the natural disturbance and hydrological regimes that maintain the wet prairie and flatwoods that Panama City crayfish originally inhabited. Historically, the Panama City crayfish inhabited natural and often temporary bodies of shallow fresh water within open pine flatwoods and prairie-marsh communities (as described in the SSA report (version 2.0; Service 2019, p. 56)). However, most of these communities have been cleared for residential or commercial development or replaced with slash pine (*Pinus elliottii*) plantations. Thus, the Panama City crayfish currently is known to inhabit the waters of grassy, gently-sloped ditches and swales; furrows within slash pine plantations; and utility rights-of-way.

Special management considerations or protections are required within critical habitat areas to address these habitat loss and destruction threats. The occupied units we are designating as

critical habitat for Panama City crayfish will require some level of management to address the current and future threats to the physical or biological features. Management activities that could ameliorate these threats include (but are not limited to): (1) Protection of lands from development through purchase, easement, or other conservation agreements that will prevent permanent conversion of Panama City crayfish habitat to other land uses; and (2) restoration and management of habitat to maintain the appropriate vegetative and hydrological characteristics for the Panama City crayfish.

These management activities will protect the physical or biological features for the species by protecting currently suitable habitat from being converted to other land uses and by promoting the appropriate vegetative and hydrological characteristics that the Panama City crayfish needs for survival. Additionally, management of habitat to protect the physical or biological features on occupied critical habitat will help achieve recovery of the Panama City crayfish.

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. When designating critical habitat, the Secretary will first evaluate areas occupied by the species. The Secretary will only consider unoccupied areas to be essential where a critical habitat designation limited to geographical areas occupied would be inadequate to ensure the conservation of the species. We are not designating any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that meet the definition of critical habitat and because occupied areas are sufficient to ensure the conservation of the species.

We reviewed available information that pertains to the habitat requirements of this species using information that was cited within the SSA report (Service 2019, entire) and information presented in the Service's conservation strategy for Panama City crayfish critical conservation needs (Service 2017b,

entire); sources of information on habitat requirements include existing State management plans, endangered species reports, studies conducted at occupied sites and published in peer-reviewed articles, agency reports, and data collected during monitoring efforts (Service 2019, entire). Based on known occurrences and habitat requirements, critical habitat units were mapped in ArcMap (ESRI, Inc.) using the U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic Database (USDA 2019, unpaginated). ArcGIS software was used to calculate the acreage of core and secondary soils within the historical range of the Panama City crayfish prior to anthropogenic habitat disturbances. Core soil types (as described in *Species Description* in the proposed listing rule (83 FR 330, January 3, 2018, pp. 332–333) and in Physical or Biological Features Essential to the Conservation of the Species, above) were buffered by 50 feet (15 m). We used 50 feet as our buffer because we found that more than 70 percent of known occurrences of Panama City crayfish occur within 50 feet of core soils and this buffer encompasses the majority of secondary soil types used by the species. In geographic information systems (GIS) mapping, the buffered soils were spatially processed by clipping to the population buffer of one-quarter mile, and developed areas were excluded based on 2020 Bay County Property Appraiser aerial imagery (Bay County Property Appraiser 2020, unpaginated).

In summary, for areas within the geographic area occupied by the species at the time of listing and with sufficient availability of land, we delineate critical habitat unit boundaries using the following criteria:

(1) Suitable habitat surrounding each of eight known populations of Panama City crayfish, delineated by polygons using one-quarter mile (0.4 kilometer (km)) circles around sample points with known species occurrences, based on the movement patterns of small crayfishes (note: Habitat surrounding four populations was not included for critical habitat designation, as explained below);

(2) Core and secondary soils within 50 feet (15 m) of core soils that contain one or more of the physical or biological features to support life-history functions essential for conservation of the Panama City crayfish.

Hardwood swamps found within core soils are considered unsuitable for the crayfish, and this habitat type was removed to the maximum extent possible.

The total acreage calculated for critical habitat based upon the above criteria amounted to 4,138 acres (1,675 ha). Accordingly, we designate as critical habitat those areas that contain the physical and biological features essential to the Panama City crayfish and that are currently occupied by the species.

For the purposes of critical habitat designation, we determined a unit to be occupied if it contains recent (*i.e.*, observed since 2015) observations of Panama City crayfish. We used 2015 as the cutoff because those surveys were the most recent comprehensive, landscape-scale surveys done, and successful crayfish reproduction was observed during those efforts, indicating it is reasonable to assume the areas are still occupied. The critical habitat designation does not include all lands known to have been occupied by the species historically; instead, it focuses on currently occupied lands that have retained the necessary physical or biological features that will allow for the maintenance and expansion of existing populations. The following locations (*i.e.*, populations as defined in the SSA report) meet the criteria of areas occupied by the species at the time of listing and that present sufficient availability of lands to support a population: 19th Street, Talkington, Minnesota, Transmitter West, Deer Point, High Point, Star, and Transmitter East. College Point and Old Airport populations were not consistently occupied, nor was there sufficient suitable habitat within the one-quarter-mile (0.4-km) polygon to support recovery, and these populations, therefore, are not included in the final designation. We also do not include Edwards, a population representing an original collection site from 1942, nor 390 West given that the fragmentation of that population by the industrial park resulted in too little remaining habitat to support population viability over time. While both areas are still occupied by Panama City crayfish, Edwards is surrounded by industrial buildings and bordered by U.S. Route 231 on its west edge, and 390 West will soon be bisected by a four-lane highway currently under construction. Potential habitat for recovery in either of these locations is limited and potentially fragmented. Long-term management will be challenging given proximity to major roadways and industrial development. As mentioned above, we exclude developed areas within the designation to the extent possible in the mapping exercise and in the text of the rule, as explained below. Designating critical

habitat in these eight occupied areas of the Panama City crayfish will sufficiently conserve the species, leading to its recovery.

We are not designating any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that are essential to the conservation of the species. In addition, based on our conservation strategy, the protection of the eight occupied units (as further described below) are sufficient for the conservation of the species.

When determining critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the Panama City 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 final rule have been excluded by text in the rule and are not designated as critical habitat. Therefore, a Federal action involving these lands will not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We designate as critical habitat areas that we have determined are occupied at the time of listing (*i.e.*, currently occupied), that contain one or more of the physical or biological features that are essential to support life-history processes of the species, and which may require special management considerations or protections.

All units contain all of the identified physical or biological features and support multiple life-history processes.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of

this document under Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation below. We will make the coordinates, plot points, or shapefiles on which each map is based available to the public on <https://www.regulations.gov> at Docket No. FWS-R4-ES-2020-0137, on our ECOS portal site <https://ecos.fws.gov>, or at the Florida Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Final Critical Habitat Designation

We are designating eight units as critical habitat for the Panama City crayfish. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for the Panama City crayfish. In total, they comprise 4,138 acres (1,675 ha) of land, entirely within Bay County, Florida. Table 4 below summarizes the approximate area and ownership of the units, which are described in detail below.

TABLE 4—CRITICAL HABITAT UNITS FOR THE PANAMA CITY CRAYFISH

Group	Unit	Unit name	Occupied	Proposed critical habitat area (in acres)	Land ownership of final critical habitat (in acres)		Final total critical habitat area (in acres)	Percent of total critical habitat designation (%)
					Private	State/local		
Western	1	19th Street	Yes	24.3	19.45	3.7	23.17	0.6
	2	Talkington	Yes	53.1	33.08	4.09	37.17	0.9
	3	Minnesota	Yes	65.0	19.07	29.96	49.02	1.2
	4	Transmitter West	Yes	248.4	179.61	2.21	181.82	4.4
Eastern	5	Deer Point	Yes	414.6	274.31	4.51	278.82	6.7
	6	High Point	Yes	38.4	36.28	0.51	36.79	0.9
	7	Star	Yes	2,761.4	1,417.8	6.49	1,424.29	34.4
	8	Transmitter East	Yes	3,571.5	2,057.47	49.92	2,107.38	50.9
Total				7,176.8	4,037.07	101.40	4,138.47	100
Percent of Total ...					98%	2%	100%	

Note: Area estimates reflect all land within critical habitat unit boundaries; area sizes may not sum due to rounding.

The eight units we are designating as critical habitat are broken into two groups, based on the western (Units 1 through 4) and eastern (Units 5 through 8) groups described in the SSA report (Service 2019, pp. 37–52). These two groups are distinguished by east-west genetic differentiation based on proximity to other populations and amounts of fragmentation within a population polygon. Below we describe each unit, and reasons why they meet the definition of critical habitat for the Panama City crayfish.

Western Group

The western group is comprised of four units supporting geographically isolated populations scattered throughout the species' range primarily in the cities of Panama City and Lynn Haven in Bay County, Florida. The

Service designates 291.2 acres (117.8 ha) in total for the western group. These populations have been isolated by residential and commercial development, which resulted in habitat loss and fragmentation. These populations are currently supported by an average of 72.8 acres (29.5 ha) of habitat (range 23.2–181.8 acres (9.4–73.4 ha)). However, the Transmitter West population is by far the largest at 181.8 acres (73.4 ha), and this population may have historically been a critical link both genetically and geographically between the western and eastern representative groups. The remaining three populations are supported by an average of 36.5 acres (14.8 ha) (range 23.2–49.0 acres (9.4–19.8 ha)). Limited habitat area needed to support each population and lack of habitat connectivity to other populations in this

group are the greatest management challenges.

Unit 1: 19th Street

The 19th Street unit includes the southwestern-most population located off 19th Street in Panama City, Florida. It is located on both sides of an active railroad track with habitat totaling 23.2 acres (9.4 ha). Land ownership is mostly private, but 3.7 acres (1.5 ha) is owned by Bay County. Only secondary soils remain undeveloped, but the elevated railroad track has artificially provided a water barrier, often keeping the site ponded when all others have dried up. Maintenance (*i.e.*, mowing and woody vegetation removal) for the railroad has kept the adjacent right-of-way covered in dense, herbaceous vegetation that is ideal for the Panama City crayfish. Adjacent unmanaged slash pine stands,

where burrows have been documented, and a mowed grass field also provide habitat.

Panama City crayfish occurrence and reproduction were documented as recently as 2016–2018. All of the essential physical or biological features are found within the unit. The essential features (*e.g.*, appropriate herbaceous groundcover vegetation and permanent or temporary pools of shallow fresh water) for this unit may require special management, particularly with respect to mowing, to ensure maintenance or improvement of the existing habitat.

Unit 2: Talkington

The Talkington unit is located off of Jenks Avenue in Panama City, Florida, with habitat totaling 37.2 acres (15.1 ha). Land ownership is entirely private, although 4.1 acres (1.7 ha) is under easement for conservation. The Talkington Family Nature Preserve forms the centerpiece of this population, with land ownership held by the Bay County Conservancy (BCC), and the associated conservation easement held by FDEP. The preserve is primarily pine flatwoods with a cluster of pond pine trees in the center portion. The Service and FWC have a management agreement in place with BCC that allows for mowing to manage the habitat on a 2- to 3-year interval, to mimic the natural fire regime and maintain ideal conditions for the Panama City crayfish. The remaining 33.1 acres (13.4 ha) of core and secondary soils in the vicinity provide opportunity for additional land protections and management, although much of this area will require restoration of vegetation.

Panama City crayfish occurrence was consistently documented since 2000, and most recently in 2016–2018. All essential physical and biological features are found within the unit. The essential features, especially appropriate herbaceous groundcover vegetation and permanent or temporary pools of shallow fresh water, in this unit may require special management; establishment of sloped swales and removal of dense shrub thickets would improve conditions for the Panama City crayfish in this unit.

Unit 3: Minnesota

The Minnesota unit is located off Minnesota Avenue in Lynn Haven, Florida, with undeveloped habitat totaling 49.0 acres (19.8 ha). Land ownership is a mix of private and public, and some area is under easement for conservation. This site is largely hardwood-cypress swamp with some possibilities for improving the habitat along 6 acres (2.4 ha) near and adjacent

to the swamp ecotone. The City of Lynn Haven owns 30 acres (12.1 ha), which is under a conservation easement held by FDEP.

The Service and FWC have a management agreement with the City of Lynn Haven that allows the agencies to manage the property when funding is available. Minimal actions have occurred to date to remove some of the pine canopy layer. Other core and secondary soils surrounding the easement consist of dense slash pine plantations. The property has deep rutting from off-road vehicles, horses, and heavy equipment, which may affect the hydrology of the habitat.

Panama City crayfish occurrence was documented in 2015 and 2016. All essential physical and biological features are found within the unit. Achieving the right mosaic of water and grasses may require special management such as improving the hydrological functions to reduce flooding at depths not conducive to persistence of the Panama City crayfish.

Unit 4: Transmitter West

The Transmitter West unit is located off Transmitter Road in Lynn Haven and Panama City, Florida, with habitat totaling 181.8 acres (73.6 ha). Land ownership is a mix of private and public, with approximately 40 percent under easement for conservation. The FDEP holds multiple conservation easements for private landowners with a total 100.5 acres (40.7 ha) of pine flatwoods. The easements are managed as required by permit with either mowing or burning, and are in good condition for the Panama City crayfish. The remaining habitats, including the 2.2 acres (0.9 ha) in public ownership owned by the City of Lynn Haven and Bay County, are in mixed condition and in need of regular management (*e.g.*, prescribed fire or mowing).

Panama City crayfish occurrence was documented most recently in 2016. All essential physical and biological features are found within the unit, with grasses maintained by fire in the past and mowing more recently. Different depths of water bodies occur that provide a mosaic of water features with herbaceous grasses to make this a good area for the Panama City crayfish. Management may be required to reduce encroaching shrubs and to remove tree debris caused by Hurricane Michael in October 2018.

Eastern Group

The eastern group is comprised of four units supporting populations scattered throughout the species' range primarily in the unincorporated

portions of Bay County, Florida. The Service designates 3,847.3 acres (1,556.9 ha) in total for the eastern group. These populations are currently supported by an average of 961.8 acres (389.2 ha) of habitat (range 36.8–2,107.4 acres (14.9–852.8 ha)). However, the Star and Transmitter East populations are the largest at 1,424.3 and 2,107.4 acres (576.4 and 852.8 ha), respectively. These two populations represent the largest connected blocks of core and secondary soils with appropriate vegetation. Although the vegetation and hydrology have been altered from native wet prairie and pine flatwoods habitats by silvicultural and agricultural uses, the geographic extent of these two populations forms the basis for the species' long-term resilience.

Unit 5: Deer Point

The Deer Point unit occurs on a peninsula located near Bay County Road 2321 in Lynn Haven and Panama City, Florida, and is supported by 278.8 acres (112.8 ha) of habitat. The land is bordered by Willams Bayou on the northeast, Mill Bayou on the southwest, and North Bay to the north. Land ownership is almost entirely private, although some areas are under easement for conservation. Only 0.9 acres (0.4 ha) is in public ownership by Bay County.

Four privately owned easements lie within or are adjacent to areas included in this unit. These easements protect 95.0 acres (38.4 ha) of core and secondary soil habitat, although some of the secondary soil habitats do not meet the criteria for inclusion within critical habitat due to distance from core soils. The Trust for Public Lands holds 90.0 acres (36.4 ha) under easement, but that easement is to be transferred to the City of Lynn Haven in the near future. FDEP holds three easements totaling 35.0 acres (14.2 ha) that are still owned by a private landowner (D&H Properties, LLC). The Service and FWC hold a management agreement with D&H Properties, LLC, and have mowed and burned 24.0 acres (9.7 ha) of this 35.0-acre (14.2-ha) property that are held in easements by FDEP. The remaining habitat is on lands that are heavily timbered and unmanaged, resulting in dense overgrowth of titi and slash pine, and hydrology may be affected by these activities as well as borrow pits and dirt roads that traverse the unit. Only the portions of these easements that meet the criteria are included as critical habitat. All need regular management, especially the lands with dense vegetation, for the crayfish to thrive.

Panama City crayfish occurrence was documented on easement lands in 2012 and 2014–2018. All of the essential

physical or biological features are found within the unit. Herbaceous groundcover is spotty, and shallow pools of water are small and unreliable, often caused by vehicle tracks, and too deep for Panama City crayfish. Special management considerations may be required to remove Hurricane Michael tree debris and to improve the hydrological impacts from timber management, borrow pits, and roads.

Unit 6: High Point

The High Point unit includes the northern-most population and is located off Bay County Road 2311 in Bay County, Florida. The population is supported by habitat totaling 36.8 acres (14.9 ha), and land ownership is almost entirely private, with some acreage under easement for conservation. Only 0.5 acres (0.2 ha) is in public ownership by Bay County. The 11-acre (4.5 hectare) Marjorie's Magical Marsh-Symone's Sanctimonious Swamp conservation easement owned by BCC contains most of the known Panama City crayfish population.

Panama City crayfish occupy 6.0 (2.4 ha) of the 11-acre (4.5 hectare) easement, which is in the process of being restored by the Service and FWC under a management agreement with BCC. These 6 acres are being restored to primarily herbaceous vegetation from a more recent dense mixture of titi shrub thicket in the under- and mid-story and slash pines in the overstory, which has lacked fire management. The remaining core and secondary soil habitat surrounding the easement was historically managed for timber but currently contains dense titi with an intermittent slash pine overstory.

Panama City crayfish occurrence was documented in 2010, 2012–2014, and 2015–2017. All essential physical and biological features are found within the unit. This population, albeit small, has herbaceous ground cover vegetation, pools of shallow water, and appropriate slope ratios, but the unit may require management to maintain the ground cover and keep shrubs from encroaching.

Unit 7: Star

This unit consists of 1,424.3 acres (576.4 ha) of habitat for Panama City crayfish. A portion of this unit is located north of the intersection of Bay County Road 2321 and U.S. Highway 231 in Bay County, Florida. Land ownership is a mix of private and public. There are no conservation easements in place, but one 1.4-acre (0.6-hectare) parcel is owned by the State of Florida and used by the Florida Highway Patrol. Although the appropriate core and

secondary soil habitat exists, the lands that run parallel to the county road are mostly in dense slash pine plantations for timber production with overgrown ground cover. The plantations east of the county road have been harvested recently. This management is sub-optimal for the Panama City crayfish because of the dense overstory canopy, lack of herbaceous ground cover, infrequent (>3 year) fire management, and bedding that may additionally affect the hydrology of the unit.

The remainder of this habitat unit is adjacent and south of U.S. Highway 231. It forms the farthest east-northeast boundary of the species' geographic range in Bay County, Florida. The population is bordered on the west by U.S. Highway 231, the north by Bayou George Creek, and the south by an unnamed tributary of Mill Bayou. These lands are mostly under timber management since the mid-1980s and in various stages of management from recent harvest to dense slash pines with dense titi shrub layers. The current timber management is sub-optimal for Panama City crayfish because of the dense overstory canopy, lack of herbaceous ground cover, infrequent (>3 year) fire management, and bedding that may additionally affect the hydrology of the unit. Land ownership is predominantly private, with approximately 5 acres (2 ha) in public ownership by Bay County. Gulf Power Company manages rights-of-way along 86 acres (34.8 ha). The Service and FWC have a management agreement with Gulf Power Company incorporating best management practices, primarily regular mowing, that have stimulated herbaceous vegetation as the primary ground cover. Currently a two-lane road, Star Avenue, bisects this population.

The population in the unit is supported by 1,424.3 acres (576.4 ha). Panama City crayfish occurrence was documented most recently in 2016. All essential physical and biological features are found within the unit. Intermittent herbaceous groundcover vegetation and temporary pools of shallow water with hardwood swamp ecotone areas do occur, but special management may be required to maintain and improve these biological features needed for increased or more connected populations. Much tree debris remains throughout the unit as a result of Hurricane Michael's 2018 impact to the landscape. It is assumed that some debris will be removed from timber company land and on other small tracts of land, but it is unknown at this time what impacts are likely to occur to Panama City crayfish

populations as lands are cleared at large-scale levels.

Unit 8: Transmitter East

The Transmitter East unit forms the farthest south-southeast boundary of the species' geographic range in Bay County, Florida. The population is bordered on the west by Transmitter Road, the south by U.S. Highway 98 and State Highway 22, the east by Callaway Creek, and the north by an unnamed tributary of Mill Bayou. The population in this unit is supported by 2,107.4 acres (852.8 ha) of habitat, which has been primarily under timber management since the mid-1980s and in various stages of management from recent harvest to dense slash pines with dense titi shrub layers.

The current management regime is sub-optimal for Panama City crayfish because of the dense overstory canopy, lack of herbaceous ground cover, infrequent (>3 year) fire management, and bedding that may additionally affect the hydrology of the unit. Land ownership is predominantly private, with only 49.9 acres (20.2 ha) in public ownership by the City of Springfield, Bay County, and the State of Florida. Gulf Power Company manages rights-of-way along approximately 114 acres (46.1 ha) of land that is populated with the Panama City crayfish. The Service and FWC have a management agreement with Gulf Power incorporating best management practices, primarily regular mowing, that have stimulated herbaceous vegetation as the primary groundcover.

Two conservation easements, 11.3 and 7.3 acres (4.6 and 3.0 ha) in size, are held by FDEP for two separate landowners. Currently, a two-lane road, Star Avenue, bisects this population. Tram Road also bisects the lower third of the area. It is currently a dirt road and there are plans for converting it to a four-lane asphalt road.

Panama City crayfish occurrence was confirmed in surveys as recent as 2016. All essential physical and biological features are found within the unit. Much tree debris, which may require management, remains throughout as a result of Hurricane Michael's 2018 impact to the landscape. It is assumed that some debris will be removed from timber company land and on other small tracts of land, but it is unknown at this time what impacts are likely to occur on the Panama City crayfish populations as lands are cleared at large-scale levels.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species.

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

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on Federal lands, on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation.

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

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

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

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

402.02) as alternative actions identified during consultation that:

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

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

(3) Are economically and technologically feasible, and

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

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

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinitiate consultation on previously reviewed actions. These requirements apply when the Federal agency has retained discretionary involvement or control over the action (or the agency’s discretionary involvement or control is authorized by law) and, subsequent to the previous consultation: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.

In such situations, Federal agencies sometimes may need to request reinitiation of consultation with us, but the regulations also specify some exceptions to the requirement to reinitiate consultation on specific land management plans after subsequently listing a new species or designating new critical habitat. See the regulations for a description of those exceptions.

Application of the “Adverse Modification” Standard

The key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As

discussed above, the role of critical habitat is to support physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

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

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

(1) Actions that would significantly alter hydrological and soil characteristics. Such activities could include, but are not limited to, those that result in wetland fill or draining or, conversely, provide additional waters to the wetland. Activities drying the wetland (via fill or draining) can result in changes in depth to water tables that are less than the depth threshold that is important for long-term Panama City crayfish population persistence. These activities can also alter soils from those that provide the sediment structure needed to allow for burrow construction down to the water table and also support the herbaceous vegetation upon which the species relies for food and shelter. Activities providing additional water can allow other crayfish species that persist in deeper waters to outcompete the Panama City crayfish.

(2) Actions that would significantly alter water quality parameters including oxygen content, temperature, and chemical composition. Such activities could include, but are not limited to, release of chemicals, excess nutrients, pesticides, and biological or other 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 crayfish and result in direct or cumulative adverse effects to these individuals and their life cycles.

(3) Actions that would significantly and permanently alter vegetative characteristics. Such activities could include, but are not limited to, residential and commercial construction; road construction; and draining, filling, or otherwise destroying or altering wetlands. These activities may lead to changes in hydrology and soil characteristics that prevent the appropriate vegetation from growing.

These activities can result in an absence or reduced levels of herbaceous vegetation that is important to the Panama City crayfish for food, detritus formation, and shelter.

Exemptions

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

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

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

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise discretion to exclude the area only if such exclusion would not result in the extinction of the species. In making the determination to exclude a particular area, the plain language of the statute, as well as the legislative history, make clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor.

We describe below the process that we undertook for taking into consideration each category of impacts and our analyses of the relevant impacts.

Consideration of Economic Impacts

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a critical habitat designation is analyzed by comparing scenarios both “with critical habitat” and “without critical habitat.”

The “without critical habitat” scenario represents the baseline for the analysis, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (e.g., under the Federal listing as well as other Federal, State, and local regulations). Therefore, the baseline 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 are not 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 particular designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this 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 Panama City

crayfish (Industrial Economics, Inc. (IEc) 2018). We began by conducting a screening analysis of the proposed designation of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographic areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (i.e., absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already 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. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. If the proposed critical habitat designation contains any unoccupied units, the screening analysis assesses whether those units require additional management or conservation efforts that may incur incremental economic impacts. This screening analysis combined with the information contained in our IEM constitute what we consider to be our draft economic analysis (DEA) of the critical habitat designation for the Panama City crayfish. As stated earlier in this document, during the comment period on the April 15, 2021, proposed rule (86 FR 19838), we received general comments that the designation would harm the local economy, but we received no specific or substantial information that would require altering the DEA. Therefore, we have adopted our DEA as our final economic analysis, and we summarize it in the narrative below.

Executive Orders (E.O.s) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. As part of our screening analysis, we considered the types of economic activities that are

likely to occur within the areas likely affected by the critical habitat designation. In our evaluation of the probable incremental economic impacts that may result from the designation of critical habitat for the Panama City crayfish, first we identified, in the IEM dated July 13, 2018, probable incremental economic impacts associated with the following categories of activities: Agriculture, forest management (silviculture, timber), development, recreation, restoration and conservation management activities, transportation, and utilities. We considered each industry or category individually. 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. In areas where the Panama City crayfish is present, Federal agencies will be required to consult with the Service under section 7 of the Act on activities they fund, permit, or implement that may affect the species. Consultation will ensure the Federal action avoids the destruction or adverse modification of critical habitat.

In our IEM, we attempted to clarify the distinction between the effects that 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 Panama City crayfish's critical habitat. Because the critical habitat for the Panama City crayfish coincides with currently occupied areas by the species, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that will adversely affect the essential physical or biological features of critical habitat will also likely result in sufficient harm or harassment to constitute jeopardy to the Panama City crayfish. 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 designation of critical habitat.

The critical habitat designation for the Panama City crayfish includes eight units, each of which contains one geographically and/or genetically distinct population of the Panama City crayfish. All of these units are in Bay County, Florida, and none occur on Federal lands. For the purposes of our critical habitat designation, we determined a unit to be occupied if it contains recent (*i.e.*, observed since 2015) observations of Panama City crayfish. All units are occupied because they contain populations of Panama City crayfish at the time of proposed listing, and each unit has features that are essential to the conservation of the species. In total, we are designating 4,138 acres (1,675 ha) as critical habitat for the Panama City crayfish. In occupied areas, any actions that may affect the critical habitat will also likely affect the species, and it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the Panama City crayfish. Incremental costs of the critical habitat designation for the Panama City crayfish are likely to be limited to additional administrative costs to consider adverse modification in consultations in all units. We anticipate that the consideration of critical habitat for the species in occupied units may increase consultation costs by 10 to 15 percent. The incremental administrative burden resulting from the designation of critical habitat for the Panama City crayfish is not anticipated to reach an annual effect of \$100 million (which is the economic threshold for a "significant regulatory action" (see section 3(f)(1) of Executive Order 12866)) based on the anticipated annual number of consultations (no more than 12) and associated consultation costs, which are not expected to exceed \$60,000 in any year. These estimates assume that consultations will occur even in the absence of critical habitat due to the presence of Panama City crayfish, and the amount of administrative effort needed to address the crayfish critical habitat during this process is relatively small. The designation is unlikely to trigger additional requirements under State or local regulations and is not expected to have perceptual effects.

Consideration of National Security Impacts

Section 4(a)(3)(B)(i) of the Act may not cover all DoD lands or areas that

pose potential national-security concerns (*e.g.*, a DoD installation that is in the process of revising its INRMP for a newly listed species or a species previously not covered). If a particular area is not covered under section 4(a)(3)(B)(i), then national-security or homeland-security concerns are not a factor in the process of determining what areas meet the definition of "critical habitat." However, the Service must still consider impacts on national security, including homeland security, on those lands or areas not covered by section 4(a)(3)(B)(i), because section 4(b)(2) requires the Service to consider those impacts whenever it designates critical habitat. Accordingly, if DoD, Department of Homeland Security (DHS), or another Federal agency has requested exclusion based on an assertion of national-security or homeland-security concerns, or we have otherwise identified national-security or homeland-security impacts from designating particular areas as critical habitat, we generally have reason to consider excluding those areas.

In preparing this final rule, we have determined that the lands within the designation of critical habitat for Panama City crayfish are not owned or managed by the DoD or DHS, and we received no requests for exclusions based on national security concerns by any agency responsible for national security or homeland security. Therefore, we anticipate no impact on national security or homeland security. Consequently, the Secretary is not exercising her discretion to exclude any areas from the final designation based on impacts on national security.

Consideration of 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 discussed above. Other relevant impacts may include, but are not limited to, impacts to Tribes, States, local governments, public health and safety, community interests, the environment (such as increased risk of wildfire or pest and invasive species management), Federal lands, and conservation plans, agreements, or partnerships. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are permitted conservation plans covering the species in the area—such as HCPs, safe harbor agreements (SHAs), or candidate conservation agreements with assurances (CCAAs)—or whether there are non-permitted conservation agreements and partnerships that may

be impaired by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designation. We also consider any State, local, public-health, community-interest, environmental, or social impacts that might occur because of the designation.

In preparing this final rule, we have determined that there are currently no HCPs or other management plans for the Panama City crayfish, and the designation does not include any Tribal lands or trust resources. We anticipate no impact on Tribal lands, partnerships, or HCPs from this critical habitat designation. Accordingly, the Secretary is not exercising her discretion to exclude any areas from the final designation based on other relevant impacts.

Required Determinations

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. OIRA has determined that this rule is not significant.

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

Under the RFA, as amended, and as understood in light of recent court decisions, Federal agencies are required to evaluate only the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself; in other words, the RFA does not require agencies 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 will be directly regulated by this critical habitat designation. There is no requirement under the RFA to evaluate the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities will be directly regulated by this rulemaking, the Service certifies that this final critical habitat designation will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the final designation will 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 this final critical habitat designation does not have a significant economic impact on a substantial number of small business entities. Therefore, a 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 critical habitat will significantly affect energy supplies, distribution, or use because these were not identified as land use sectors within the critical habitat areas. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

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

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

(1) This final rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both "Federal intergovernmental mandates" and "Federal private sector mandates." These terms are defined in 2 U.S.C. 658(5)–(7). "Federal intergovernmental mandate" includes a regulation that "would impose an enforceable duty upon State, local, or tribal governments" with two exceptions. It excludes "a condition of Federal assistance." It also excludes "a duty arising from participation in a voluntary Federal program," unless the regulation "relates

to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,” if the provision would “increase the stringency of conditions of assistance” or “place caps upon, or otherwise decrease, the Federal Government’s responsibility to provide funding,” and the State, local, or Tribal governments “lack authority” to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. “Federal private sector mandate” includes a regulation that “would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.”

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

(2) We do not believe that this rule will significantly or uniquely affect small governments. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. 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 the Panama City 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 for the designation of critical habitat for the Panama City crayfish, and it concludes that this designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this final 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 critical habitat designation with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the final rule does not have substantial direct effects either on the States, or on the relationship between the national government and the States, or on the distribution of powers and responsibilities among the various levels of government. The designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and

what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act will 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 designated critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this final rule identifies the elements of physical or biological features essential to the conservation of the species. The areas of designated critical habitat are presented on maps, and the final rule provides several options for the interested public to obtain more detailed location information, if desired.

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

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

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

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 the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) in connection with regulations adopted pursuant to section 4(a) of 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 determined that no Tribal lands fall within the boundaries of the critical habitat for the Panama City crayfish, so no Tribal lands will be affected by the designation.

References Cited

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

Authors

The primary authors of this final rule are the staff members of the Fish and Wildlife Service’s Species Assessment Team and the Florida Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and

recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we 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), the List of Endangered and Threatened Wildlife, by adding an entry for “Crayfish, Panama City” in alphabetical order under CRUSTACEANS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* CRUSTACEANS	*	*	*	* * *
* Crayfish, Panama City	* <i>Procambarus econfinae</i>	* Wherever found	* T	* 86 FR [INSERT FEDERAL REGISTER PAGE WHERE THE DOCUMENT BEGINS], 1/5/22; 50 CFR 17.46(b); ^{4d} 50 CFR 17.95(h). ^{CH}
* 	* 	* 	* 	*

■ 3. Amend § 17.46 by adding paragraph (b) to read as follows:

§ 17.46 Special rules—crustaceans.

* * * * *

(b) Panama City crayfish (*Procambarus econfinae*)—(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the Panama City crayfish. Except as provided under paragraph (b)(2) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:
(i) Import or export, as set forth at § 17.21(b) for endangered wildlife.
(ii) Take, as set forth at § 17.21(c)(1) for endangered wildlife.
(iii) Possession and other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of a commercial activity, as set forth at § 17.21(e) for endangered wildlife.
(v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.
(2) *Exceptions from prohibitions.* In regard to this species, you may:
(i) Conduct activities as authorized by a permit under § 17.32.
(ii) Take, as set forth at § 17.21(c)(2) through (4) for endangered wildlife.
(iii) Take as set forth at § 17.31(b).
(iv) Take incidental to an otherwise lawful activity caused by:
(A) Development practices that:
(1) Maintain existing structures, and build or rebuild structures that occur within the existing footprint of previously developed areas;
(2) Build new structures that occur within 100 feet of existing structures on an individual private landowner’s property and with a new footprint less

than 1,000 square feet, such as a pool or shed associated with an existing house;
(3) Install culverts for individual landowners not associated with housing developments on lands greater than one acre;
(4) Build platforms or boardwalks for recreational purposes on conservation lands that allow sunlight of sufficient levels to maintain herbaceous groundcover; and
(5) Build paths used for nonmotorized activities as long as the project footprint, including construction impacts, alter no more than 5 percent of the acreage in core or secondary soils within lands under a conservation easement.
(B) Certain land management activities, including:
(1) Silvicultural (forestry) activities located in secondary soils that follow State best management practices (BMPs);

(2) Prescribed burning and wildfire control efforts when following State BMPs, guidelines, or permit conditions;

(3) Herbicide application activities targeting exotic plants or shrub species when following all other State and Federal BMPs, guidelines, or permit conditions; and

(4) Agricultural maintenance activities in pasture and rangelands (including cattle operations) that were established prior to January 3, 2018, and that implement State and Federal BMPs for existing farms and ranches if they have no indirect impacts to adjacent Panama City crayfish habitat.

(C) Utility actions, including:

(1) Ditch mowing and maintenance outside of critical habitat units;

(2) Ditch mowing or maintenance within critical habitat units after development of BMPs in coordination with the local Service office;

(3) Culvert replacements or maintenance on individual landowner properties that do not adversely affect, but improve or restore, the natural hydrology; and

(4) After coordination with the local Service office, the following activities: Maintenance associated with rights-of-way (including mowing, use of herbicides, and mechanical side trimming); powerline and pole placements and replacements; replacement of critical structural components, such as crossarms, insulators, conductors, etc.; and directional boring by utility owners.

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

■ 4. Amend § 17.95(h) by adding an entry for “Panama City Crayfish (*Procambarus econfinae*)” immediately following the entry for “Pecos Amphipod (*Gammarus pecos*)” to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(h) *Crustaceans.*

* * * * *

Panama City Crayfish (*Procambarus econfinae*)

(1) Critical habitat units are depicted for Bay County, Florida, on the maps in this entry.

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

(i) Undeveloped lands, including cropland, utilities rights-of-way, timberlands, and grazing lands, that support open wet pine flatwoods and wet prairie habitats that contain the following:

(A) Appropriate herbaceous ground cover vegetation;

(B) Permanent or temporary pools of shallow (usually less than 1 foot) freshwater locations; and

(C) Gently sloped ground-level swales with a 3:1 or shallower slope ratio along ecotonal or transitional areas.

(ii) Soil types within undeveloped lands that provide sediment structure needed for burrow construction and that support mostly native herbaceous vegetation needed for additional food and shelter, and where the ground water is always within 3 feet of the ground surface and surface waters occur on occasion. These soil types include:

(A) Core soils for Panama City crayfish, including Pamlico-Dorovan Complex, Rutlege Sand, Plummer Sand, Pelham Sand, Pantego Sandy Loam, and Rutledge-Pamlico Complex;

(B) Secondary soils within 50 feet (15 meters) of core soils: Albany Sand, Lee field Sand, Leon Fine Sand, Osier Fine Sand, and Alapaha Loamy Sand; and

(C) Soils that currently, or can eventually, support native herbaceous vegetation such as, but not limited to, wiregrass (*Aristida beyrichiana*), redroot

(*Lachnanthes caroliniana*), beakrushes (*Rhynchospora* spp.), pitcher plants (*Sarracenia* spp.), sundews (*Drosera* spp.), butterworts (*Pinguicula* spp.), and lilies (*Hymenocallis* spp.).

(iii) Undeveloped lands that contain surface and groundwater of sufficient quality to support all life stages of the Panama City crayfish and the herbaceous vegetation on which they rely, specifically surface waters with:

(A) Oxygen levels that range between 2 and 9 milligrams per liter;

(B) pH levels between 4.1 and 9.2; and

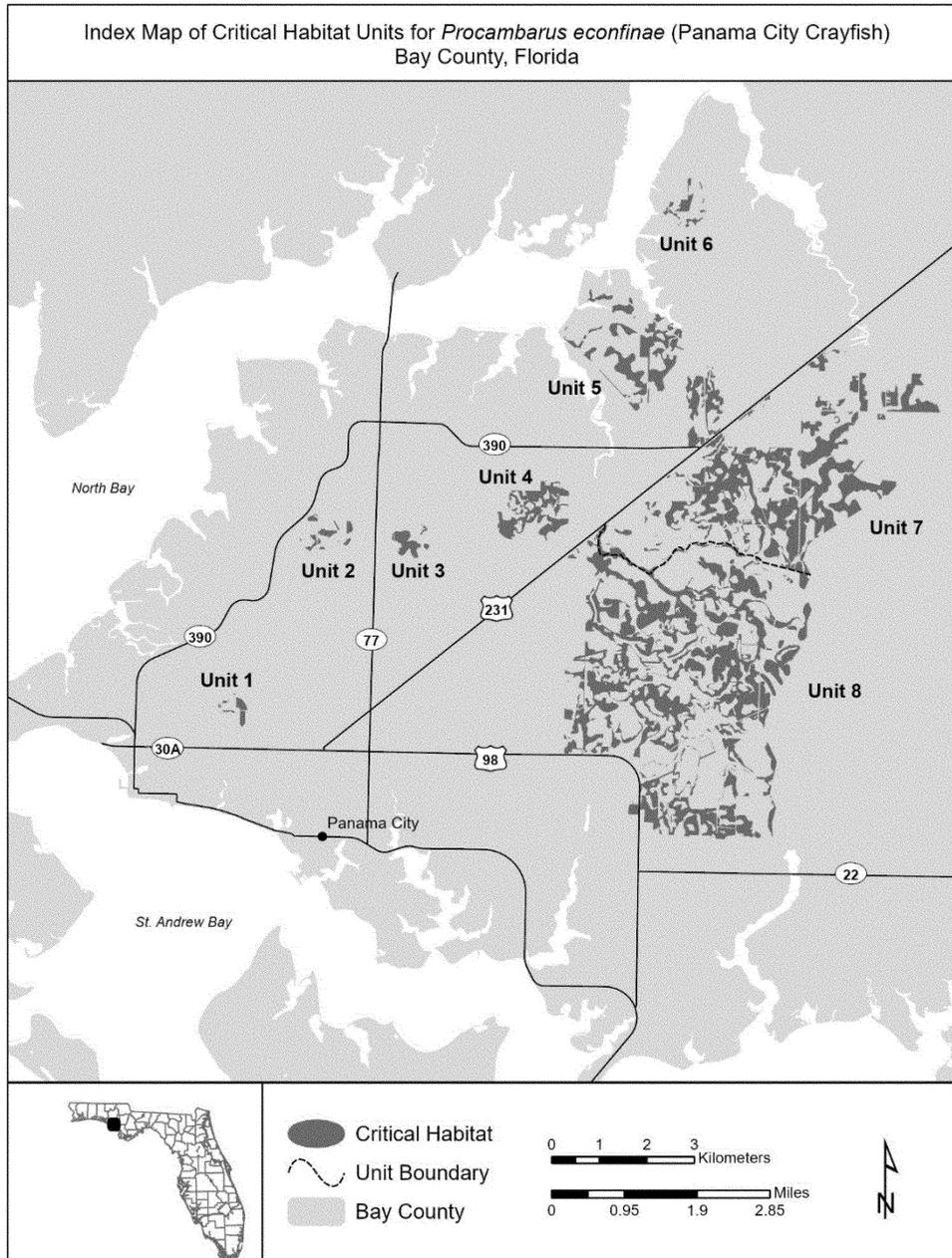
(C) Temperatures between 42 and 94 degrees Fahrenheit (°F) (5 and 34.4 degrees Celsius (°C)), although optimum temperatures are thought to be in the range of 68 to 79 °F (20 to 26 °C).

(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 February 4, 2022.

(4) Data layers defining map units were created based on known occurrences and habitat requirements. Critical habitat units were mapped in ArcMap (ESRI, Inc.) using the U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic Database dataset. 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 <https://www.regulations.gov> at Docket No. FWS-R4-ES-2020-0137 and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Note: Index map follows:

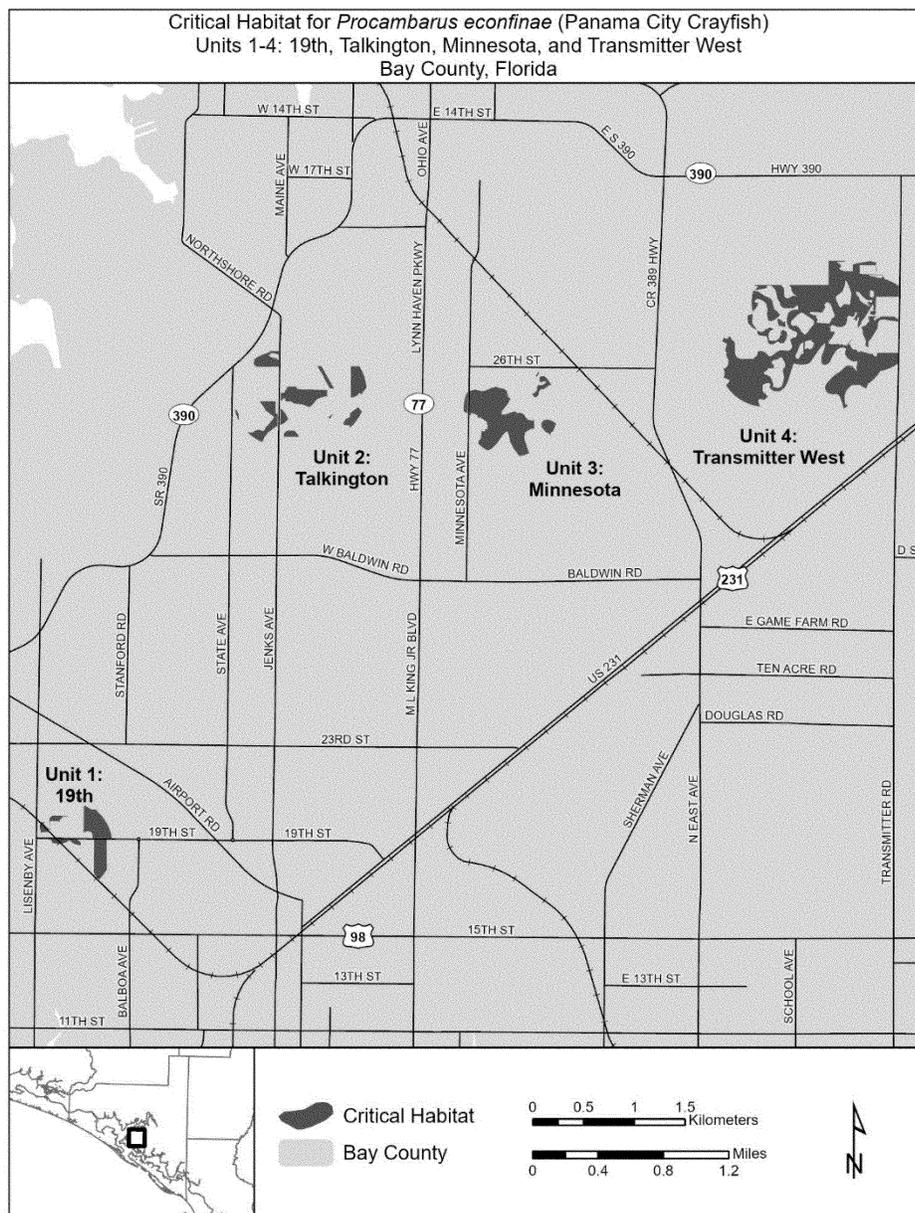
Figure 1 to Panama City Crayfish (*Procambarus econfinae*) paragraph (5)



(6) Unit 1: 19th Street, Bay County, Florida.
 (i) Unit 1 consists of 23.2 acres (9.4 ha) and is composed of lands in State,

county, or city ownership (3.7 ac (1.5 ha)), and private ownership (19.5 ac (7.9 ha)).

(ii) Map of Units 1, 2, 3, and 4 follows:

Figure 2 to Panama City Crayfish (*Procambarus econfinae*) paragraph (6)(ii)

(7) Unit 2: Talkington, Bay County, Florida.

(i) Unit 2 consists of 37.2 acres (15.1 ha) and is composed of lands in State, county, or city ownership (4.09 ac (1.7 ha)), and private ownership (33.08 ac (13.4 ha)).

(ii) Map of Unit 2 is provided at paragraph (6)(ii) of this entry.

(8) Unit 3: Minnesota, Bay County, Florida.

(i) Unit 3 consists of 49.0 acres (19.8 ha) and is composed of lands in State, county, or city ownership (30.0 ac (12.1 ha)), and private ownership (19.1 ac (7.7 ha)).

(ii) Map of Unit 3 is provided at paragraph (6)(ii) of this entry.

(9) Unit 4: Transmitter West, Bay County, Florida.

(i) Unit 4 consists of 181.8 acres (73.6 ha) and is composed of lands in State, county, or city ownership (2.2 ac (0.9

ha)), and private ownership (179.6 ac (72.7 ha)).

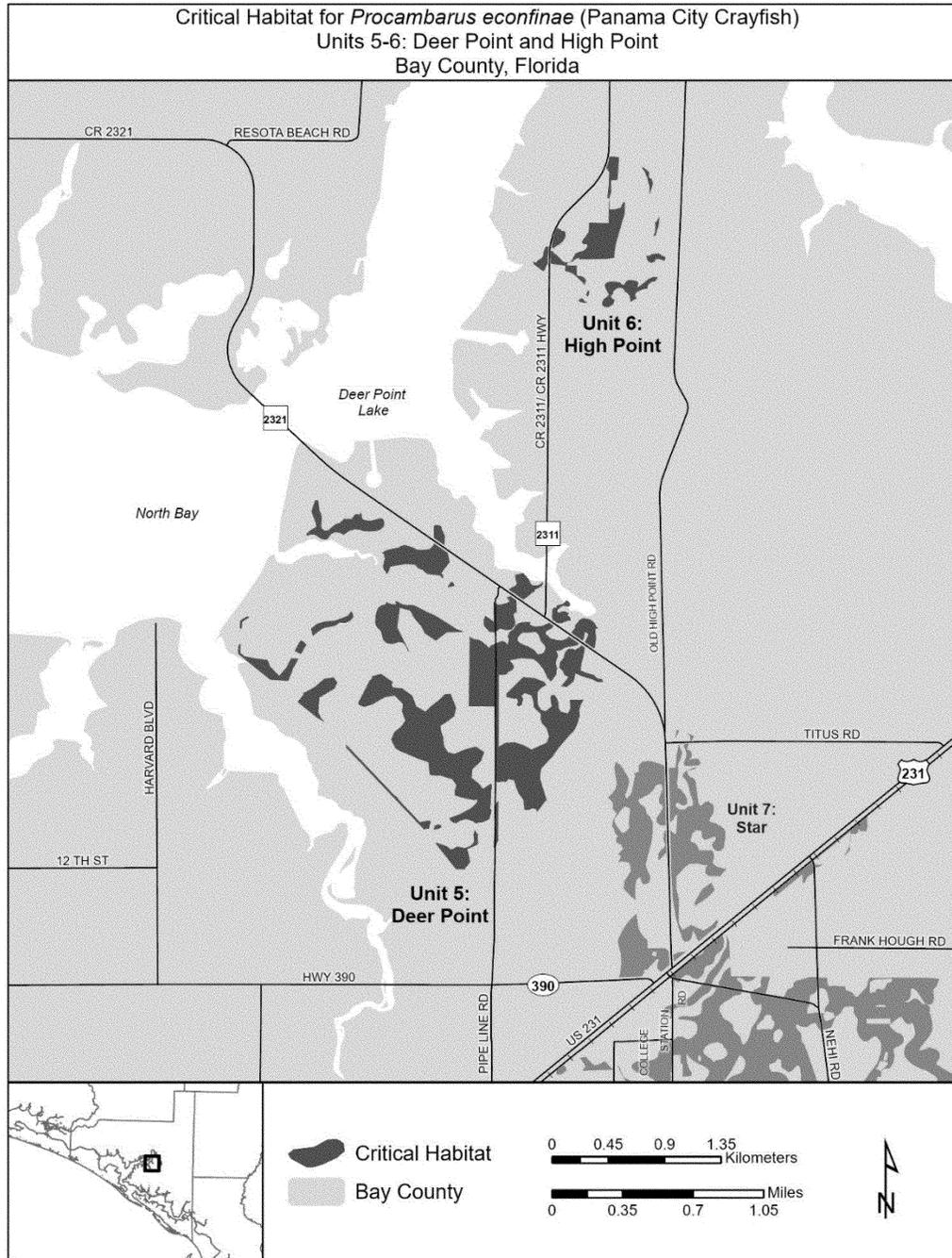
(ii) Map of Unit 4 is provided at paragraph (6)(ii) of this entry.

(10) Unit 5: Deer Point, Bay County, Florida.

(i) Unit 5 consists of 278.8 ac (112.8 ha) and is composed of lands in State, county, or city ownership (4.5 ac (1.8 ha)), and private ownership (274.3 ac (111.0 ha)).

(ii) Map of Units 5 and 6 follows:

Figure 3 to Panama City Crayfish (*Procambarus econfinae*) paragraph (10)(ii)



(11) Unit 6: High Point, Bay County, Florida.

(i) Unit 6 consists of 36.8 ac (14.9 ha) and is composed of lands in State, county, or city ownership (0.5 ac (0.2

ha)), and private ownership (36.3 ac (14.7 ha)).

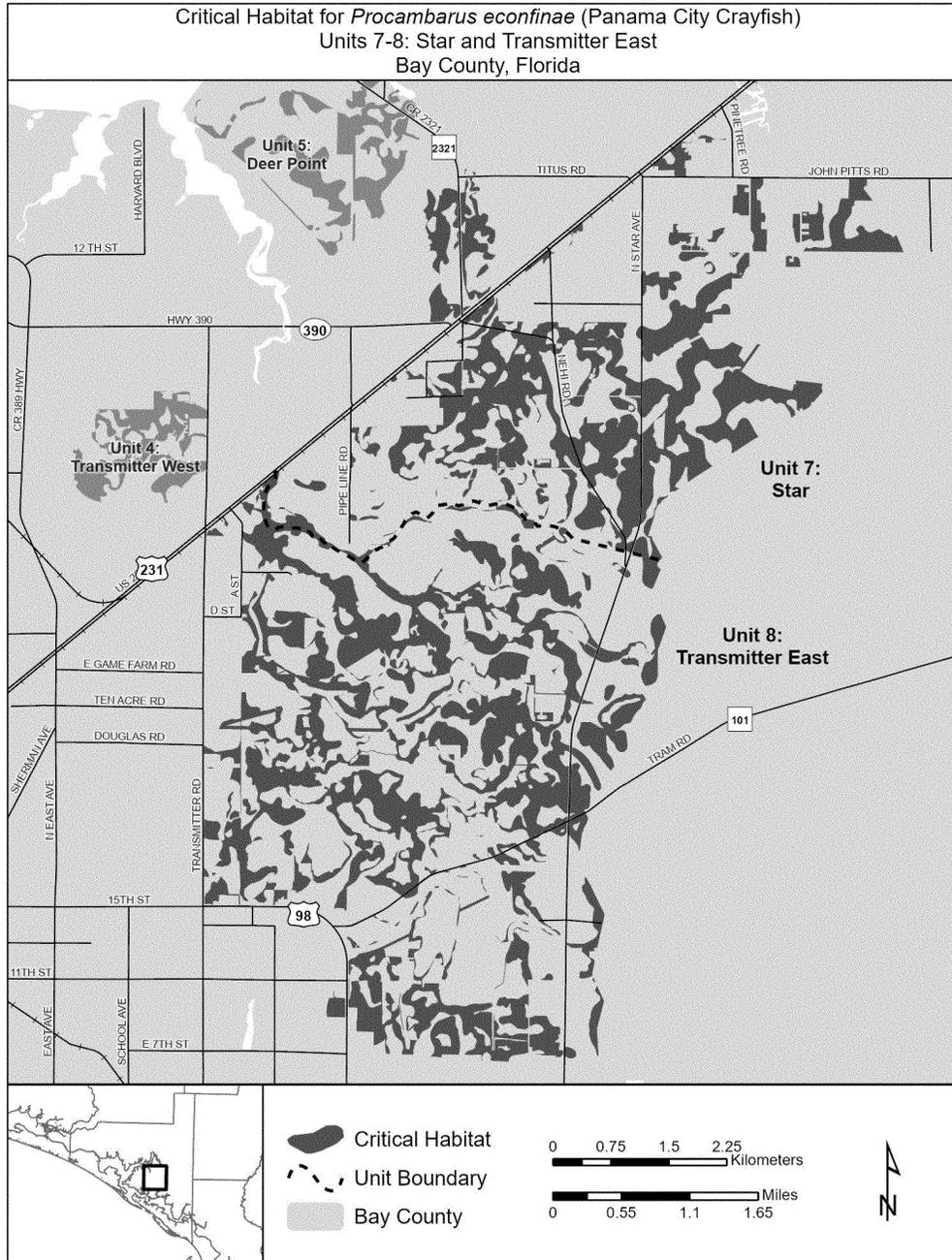
(ii) Map of Unit 6 is provided at paragraph (10)(ii) of this entry.

(12) Unit 7: Star, Bay County, Florida.

(i) Unit 7 consists of 1,424.3 ac (576.4 ha) and is composed of lands in State, county, or city ownership (6.5 ac (2.6 ha)), and private ownership (1,417.8 ac (573.8 ha)).

(ii) Map of Units 7 and 8 follows:

Figure 4 to Panama City Crayfish (*Procambarus econfinae*) paragraph (12)(ii)



(13) Unit 8: Transmitter East, Bay County, Florida.

(i) Unit 8 consists of 2,107.4 ac (852.8 ha) and is composed of lands in State, county, or city ownership (49.9 ac (20.2

ha)), and private ownership (2,057.5 ac (832.6 ha)).

(ii) Map of Unit 8 is provided at paragraph (12)(ii) of this entry.

* * * * *

Martha Williams,
Principal Deputy Director, Exercising the
Delegated Authority of the Director, U.S. Fish
and Wildlife Service.

[FR Doc. 2021-27519 Filed 1-4-22; 8:45 am]

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