Programmatic
Biological Opinion
FINAL

A Programmatic approach for Florida Department of Transportation Activities within Panama City Crayfish Habitat Bay County, FL

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Prepared by:

U.S. Fish and Wildlife Service
Florida Ecological Services Field Office
1601 Balboa Avenue
Panama City, FL 32405

PATRICIA KELLY Digitally signed by PATRICIA KELLY
Date: 2022.07.18 11:38:21 -05'00'

Patty Kelly, Wildlife Biologist — Date
Lydia Ambrose, GIS Specialist

ROBERT CAREY Digitally signed by ROBERT CAREY
Date: 2022.07.18 16:02:21 -04'00'

Robert L. Carey, Division Manager, Environmental Review — Date

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CONSULTATION HISTORY

This section lists key events and correspondence during the course of this consultation. A complete administrative record of this consultation is on file in the U.S. Fish and Wildlife Service's (FWS) Florida Ecological Services Field Office, in Panama City, Florida.

2018-01-03	FWS announced 12-month finding on a petition to list the Panama City crayfish (*Procambarus econfinae*) (Crayfish), as a threatened species under the Endangered Species Act, noting that "Infrastructure development has impacted, or is anticipated to impact, several crayfish sites. For example, several proposed road construction or expansion projects, 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".
2018-04-06	FDOT provided information in response to the Service's questions regarding FDOT projects in the area considered for critical habitat designation for the Crayfish.
2018-04-25	FDOT commented on the FWS's Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Crayfish.
2018-11-27	Coordination Meeting with FDOT, and FWS held at the FDOT District 3 Office, Chipley, Florida to discuss status of the Crayfish listing process, FDOT's SR 390 project in Panama City, and steps for a conference opinion prior to listing.
2019- Spring	FWS initiated dialogue with Florida Department of Transportation (FDOT) on recovery actions via the consultation process deemed suitable to conserve the Crayfish.
2019-07-15	DOT provides a letter of intent to the FWS to participate in conservation efforts which contemplate a programmatic conference opinion (PCO) that would cover all FDOT's ROW lands in the Crayfish range. A primary conservation measure is to include funding an endowment for long term management of lands protected for the Crayfish.
2019-12-10	FDOT issued its Final Environmental Impact Statement for the Gulf Coast Parkway from SR 30 (US 98) Gulf Co. to SR 75 (US 231) Bay Co., District 3 Florida. The FEIS identified the preferred alternative because it has "…less impacts to the Crayfish, a species of special concern, that has been proposed for listing as threatened under the Endangered Species Act by the Service, and its habitat…".

2019-07-15	DOT provides a letter of intent to the FWS to participate in conservation efforts which contemplate a programmatic conference opinion (PCO) that would cover all FDOT's ROW lands in the Crayfish range. A primary conservation measure is to include funding an endowment for long term management of lands protected for the Crayfish.
2019-12-10	FDOT issued its FINAL ENVIRONMENTAL IMPACT STATEMENT for the Gulf Coast Parkway from SR 30 (US 98) Gulf Co. to SR 75 (US 231) Bay Co., District 3 Florida. The FEIS identified the preferred alternative because it has "…less impacts to the Crayfish, a species of special concern, that has been proposed for listing as threatened under the Endangered Species Act by the Service, and its habitat…".
2020-02-06	FDOT District 3 staff hosted a meeting with the FWS, FWC, and FDOT Office of Environmental Management (OEM) to discuss an approach for a programmatic conference opinion, including an analysis, a strategy, and intended timeframes.
2020-07-13	The FWS sends a letter to FDOT updating them on intended recovery actions initiated with Bay County staff, the FWS and FWC. The FWS formally requested that FDOT consider a $3.5 million endowment for land management to offset impacts associated with all FDOT projects within the Crayfish's range as well as to assist in recovery in support of the ESA's Section 7(a)(1) intentions of federal authorities to achieve recovery actions.
2020-July	Upon receipt of the FWS's letter, FDOT, in support, initiated drafting a conference/biological assessment.
2021-03-24	FDOT provided the FWS with a biological assessment (BA), thereby initiating formal conferencing and the FWS confirms receipt of the biological assessment and request for formal consultation.
2021-04-15	FWS reopened the comment period on the proposed rule to list the Crayfish as a threatened species under the Endangered Species Act of 1973, with a proposed rule under section 4(d) of the Act for the species; and proposed to designate critical habitat for the Crayfish in Bay County, Florida.
2021-09-30	FWS provided a draft conference/biological opinion to FDOT for their initial review.

2021-10-22	FDOT provided the FWS comments on their initial review of the conference/biological opinion.
2022-02-04	The final listing of the Crayfish became effective February 4, 2022. The species is listed as Threatened and critical habitat is designated.
2022-March	FDOT and FWS continue dialogue and fill information gaps to finalize the consultation process. Several meetings and electronic correspondences focused largely on stormwater ponds and their inclusion into BO.

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BIOLOGICAL OPINION

1. INTRODUCTION

A biological opinion (BO) is the document that states the opinion of the U.S. Fish and Wildlife Service (FWS) required under section 7 of the Endangered Species Act of 1973, as amended (ESA), as to whether a Federal action is likely to

- jeopardize the continued existence of species that is listed as endangered or threatened; or
- result in the destruction or adverse modification of designated critical habitat.

A BO evaluates the effects of a Federal action along with those resulting from interrelated and interdependent actions, and from non-Federal actions unrelated to the proposed Action (cumulative effects), relative to the status of species listed and the status of any associated designated critical habitat. This document was initiated as a combined Conference Opinion/BO, because of the very near potential for the proposed listing and designation of critical habitat to become final. The listing of the Panama City crayfish occurred on February 5, 2022. We therefore move forward with a BO. A FWS opinion that concludes a proposed Federal action is *not* likely to jeopardize species and is *not* likely to destroy or adversely modify critical habitat fulfills the Federal agency's responsibilities under §7(a)(2) of the ESA of 1973, as amended.

"*Jeopardize the continued existence*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02).

"*Destruction or adverse modification*" means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features (50 CFR §402.02).

2. PROPOSED ACTION

In early 2019, the Service invited FDOT to join a partnership with Bay County's Engineering Department (Bay County), Florida Fish and Wildlife Conservation Commission (FWC), and the FWS to develop a cohesive conservation effort to address the essential needs of the Panama City crayfish, *Procambarus econfinae* (Crayfish). FDOT supported the collective conservation initiative idea and joined the effort by a letter of intent dated July 15, 2019. The Crayfish, initially a candidate for listing under the ESA when conservation discussions began, was proposed as Threatened in January 3, 2018 [83 FR 330], then became officially listed under the ESA, effective February 4, 2022 [87 FR 546]. Habitat loss, degradation, and fragmentation are the primary threats affecting the species. Bay County staff committed to find funds to acquire lands needed for the Crayfish to the extent possible and has partially achieved this action. Through the partnership, FWS and FWC agreed to finalize species monitoring and habitat

management plans by 2023 - these efforts are underway. Upon completion of this consultation, FDOT will contribute funds for mitigation and recovery to an endowment for the long-term management and acquisition of Crayfish habitat in exchange for a programmatic consultation that covers all actions under their purview within the range of the Crayfish. Their up-front consultation and conservation measures, recognized in this programmatic biological opinion (PBO), will allow conservation actions, namely habitat management and priority land acquisition, to expedite recovery of the Crayfish, regardless of its listing status. This partnership will be a model example of how up-front efforts of streamlined consultation are cost-effective and time efficient, while providing certainty of funding for the primary recovery needs of the Crayfish.

FDOT's BA (2021) and this PBO provide an analysis of impact for the Action Area - the entirety of the State Highway System (SHS) within Bay County that occurs within the designated range of Panama City crayfish (Crayfish, hereafter), including Critical Habitat. It considers all current, proposed, and future right-of-way (ROW) needs for any SHS roadway action, including new facilities, storm water facilities, sidewalks, bike lanes, multi-use paths or other required action to maintain or improve the SHS. Within this PBO, we consider the direct and indirect impacts associated with the following actions: 1) transportation improvements to and construction of SHS facilities (existing and future); 2) roadway maintenance activities; 3) safety improvements; 4) traffic improvements; 5) drainage improvements, including storm water management facilities; and 6) all other actions needed by FDOT as part of the normal operations of the SHS. The Project Area is in the central-eastern portion of Bay County, Florida within the depicted range of the Crayfish (Figure 2.1). **As a result of coordination with FDOT all mandatory actions written within their PBA and this PBO --Conservation Measures, Commitments, and Terms and Conditions—were collated into Appendix 1. These are mandatory actions upon signature of this PBO.**

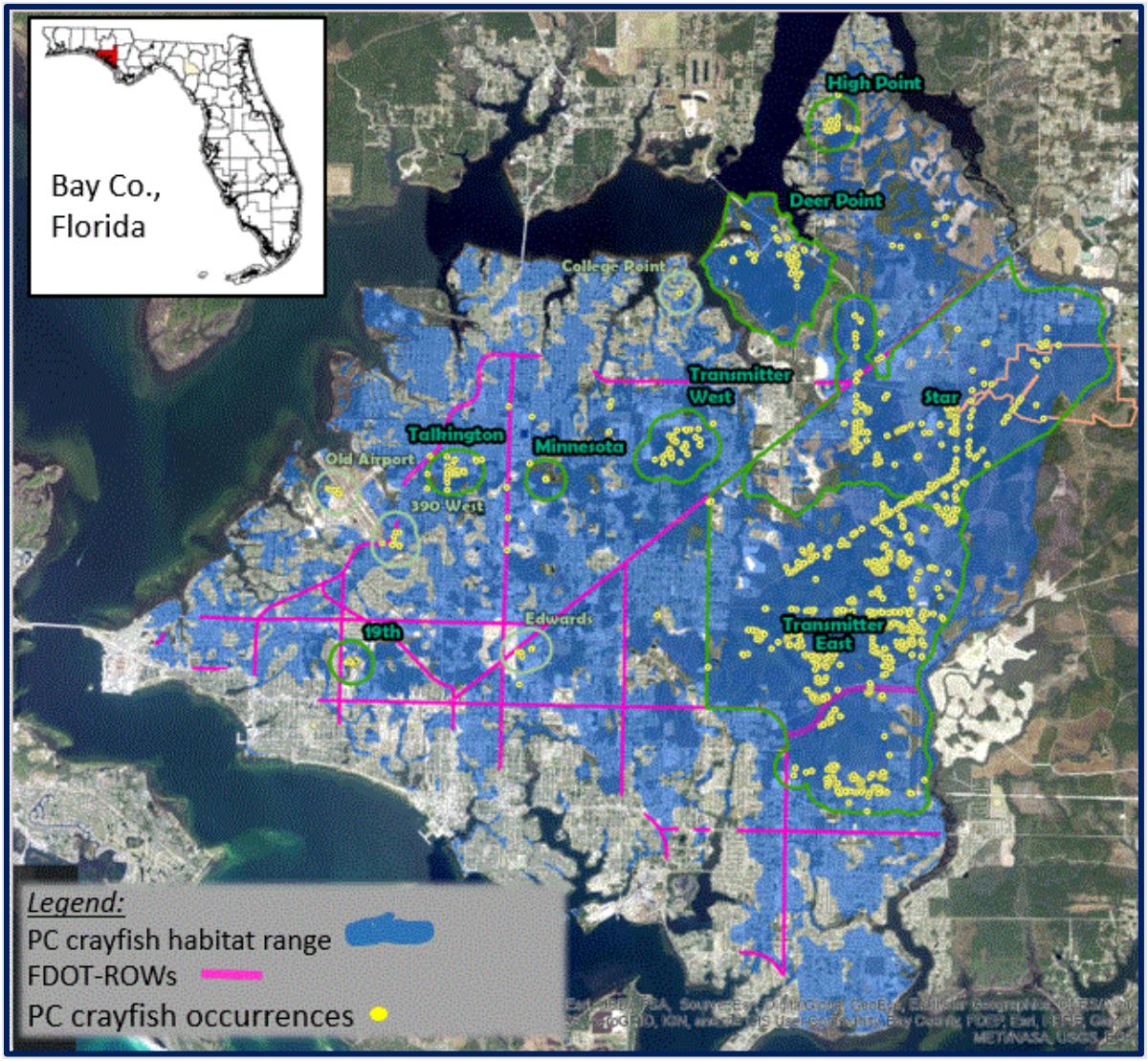

Figure 2.1. The Action Area involves the entirety of the State Highway System within Bay County that occurs within the designated range of the Panama City crayfish, *P. econfinae* (including Critical Habitat).

2.1. Action Area

For purposes of consultation under ESA §7, the Action Area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02). The Action Area (Figure 2.1) is the same as the Project Area and includes all ROW lands under FDOT jurisdiction within the range of the Crayfish (Figure 2.1) and additional nearby lands needed for future transportation ROW and stormwater pond facilities. The exact locations of these future areas have yet to be determined; we therefore analyzed a scenario considering greatest impacts of their potential effects on the crayfish.

2.2. Project Action #1 —Road Works

Geographical Information System (GIS) data layers (shapefiles) provided by FDOT included all lands under FDOT jurisdiction within the range of the Panama City crayfish (Crayfish) (Figure 2.1). The total acreage within historic and current Crayfish habitat within suitable soils is 606.49 acres - this is the estimated maximum ROW (existing and future needs) in core and secondary soils. Approximately 258.18 acres overlay in core soils and 348.31 acres in secondary soils.

Most future impact actions considered here include land clearing, repaving of existing roads, construction of new paved areas (roads, multiuse paths, sidewalks, and trails, creation of drainage features, ditches, swales, culvert crossings), landscaping improvements, maintenance activities, and any other improvements required to maintain the integrity of the roadway system for the traveling public. Emergency flood control actions within FDOT's ROW are also considered.

2.2.1. Conservation Measures

Conservation measures are actions to benefit or promote the recovery of a listed species that are included by the Federal agency as an integral part of the proposed action. These actions are required by the Federal agency or applicant and serve to minimize or compensate for project effects on the listed species. FDOT personnel and/or their contractors will implement the following conservation measures as part of the road work actions and as summarized in FDOT's BA (2021) and Appendix 1 (attached). Existing box-cut ditches are not considered Crayfish habitat and are exempt from these maintenance conservation measures.

a) Maintain ditches with side slopes equal to or greater than 3 feet horizontal to 1 foot vertical; 4 feet horizontal to 1 foot vertical preferred.
b) Maintain ditches with rounded bottoms. Avoid creating box cut ditches.
c) If possible, perform ditch maintenance when no standing water is present.
d) Re-vegetate side slopes as soon as possible with low-growing grasses, sedges, and herbs.
e) Ditches should be mowed with little to no rutting. Boom arm mowers are preferred to reduce rutting from equipment.
f) Remove no more than 12 inches of soil during ditch maintenance procedures.
g) FDOT will follow Spec. 7-1.4 (see Appendix 1, FDOT Panama City crayfish Programmatic Biological Assessment 2021) regarding staging of equipment and materials to avoid impacts to Crayfish habitat and commit to not allowing the staging of equipment or materials within areas designated as Critical Habitat.
h) FDOT will notify the FWS and FWC six months in advance of construction projects to allow adequate time for agencies to capture and relocate Crayfish from project areas, should the agencies decide to do so, but will not rely on the assistance of FDOT for these efforts. Notification to FWS and FWC of actions going to construction will not include regular maintenance activities and/or notification to the agencies may be significantly reduced based on timing of the action. Surveys and captures will be completed prior to the onset of construction activities.

2.3. Project Action #2 —Stormwater Ponds

Future stormwater ponds may have a direct impact to Crayfish and their habitats. FDOT expects no more than 144 acres of impact to occur from future stormwater ponds. Of the twelve Habitat Units currently delineated for the Crayfish, populations at College Point, Old Airport, and Minnesota are considered recently extirpated. The species recovery strategy does not include a marginal population at 390 West, so impacts to the remaining 8 habitat areas (Minnesota, Transmitter West, 19th St, Talkington, Deer Point, High Point, Star and Transmitter East) will be avoided wherever possible. FDOT has made specific commitments to this effect:

a. No stormwater ponds will be placed within (or near enough to impact) the smaller **Talkington** and **19th Street** populations.
b. A maximum distance from existing roads that ponds would be placed will be limited to 0.5 miles from DOT ROW lands (excluding Talkington and 19th Habitat Units).
c. Ponds may be required within the Transmitter East units near Tram Road; however, they will be prioritized on the south side where habitat is less important for Crayfish recovery goals.
d. Ponds may be required within the Star, Deer Point, and Transmitter East Habitat Units in habitat that parallels Highway 231.

Prior to placement of future ponds, FDOT will consider the hydrology, location, size, and shape of future stormwater facilities (ponds, ditches, swales) to avoid or minimize impacts to Crayfish, critical habitat, and their commitments in the PBO until recovery has been achieved (FDOT BA 2021; also, *Conservation Measures* within this PBO). The FWS assumes total loss of Crayfish within the 144 acres of habitat from direct or indirect impacts associated with stormwater construction and placement although, depending on slopes and fill amounts, it is conceivable that use by the Crayfish will occur, post construction at minimal levels.

2.3.1. Conservation Measures

Conservation measures are actions to benefit or promote the recovery of a listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant and serve to minimize or compensate for project effects on the listed species as summarized in FDOT's BA (2021) and Appendix 1 (attached). FDOT personnel and/or their contractors will implement the following conservation measures as part of their stormwater pond features:

a) FDOT will consider the location, size, and shape of future stormwater facilities (ponds, ditches, swales) to avoid or minimize impacts to Critical Habitat Units.
b) FDOT will follow Spec. 7-1.4 (see Appendix 1, FDOT BA, Crayfish Programmatic, 2019) regarding staging of equipment and materials to avoid impacts to Crayfish habitat and commit to not allowing the staging of equipment or materials within areas designated as Critical Habitat.
c) FDOT will notify the FWS and FWC six (6) months in advance of construction projects to allow for appropriate time for agencies to conduct capture and relocation of Crayfish from project areas should FWS or FWC decide to do so but will not rely on the assistance

of FDOT in any manner. Surveys and captures by FWS or FWC must be completed prior to the onset of construction activities.

2.4. Project Action #3 —Recovery

Section 7(a)(1) of the Act directs Federal agencies to carry out programs for the conservation of threatened and endangered species in consultation with the FWS. Effective implementation of 7(a)(1) can allow us to collectively achieve better conservation, more efficiently. FDOT recognizes that the majority of their proposed Conservation Measures associated with roadway construction and improvement actions are difficult too measure (FDOT BA 2021). FDOT commits to the following Conservation Measure (as described in 2.4.1 of this document), contingent on this FWS issued PBO. FDOT expects no additional conservation measures beyond those written in this document and within the associated BA as summarized within this document at 2.2.1, 2.3, 2.3.1 and 2.4.1 (FDOT 2021). All of FDOT's Conservation Measures as summarized in FDOT's BA (2021) and Appendix 1 (attached) are mandatory.

2.4.1. Conservation Measures

FDOT commits to contribute $3.5 million dollars to a FWS structured endowment fund for the conservation of the Crayfish to be utilized in the long-term conservation of the species, contingent upon the efforts summarized in paragraph 2.4 Project Action #3. FDOT will attempt to make the contribution within 6 to 12 months, but has up to 18 months after receiving a letter from FWS that the endowment has been established. If payment is not made within the 6 to 12 months, FDOT will provide FWS an update on the status of the payment. In recognition of the benefits of the FDOT contribution and implementation of the proposed Conservation Measures, no further consultation will be required for any FDOT action that will occur within the existing or future right-of-way along the SHS in Bay County, Florida, within the designated species range of *P. econfinae* as described within this BO. Exceptions that may trigger re-initiation are found in Section 12: Reinitiation Notice. This programmatic approach will remain effective until the species is recovered which is defined as "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act" (50 CFR §402.02).

2.5. Interrelated and Interdependent Actions

A BO evaluates the potential effects of a proposed Federal action. For purposes of consultation under ESA §7, the effects of a Federal action on listed species or critical habitat include the direct and indirect effects caused by the action, plus the direct and indirect effects caused by interrelated or interdependent actions. "Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR §402.02).

The majority of proposed interrelated and interdependent actions associated with and influenced by FDOT projects that are initiated by other federal, state, and private companies within the

Crayfish range will require separate evaluation of impacts to the species through the ESA consultation process and therefore are not included in this analysis.

3. CONCURRENCE

The FDOT has determined that the Action is 'not likely to adversely affect' eastern indigo snake (*Drymarchon couperi*). The FWS concurs with this determination, since the species, until recently, has been largely extirpated from the Florida panhandle, and recent reintroductions occur outside the Action Area. The Eastern indigo snake has not been observed within the range of the Crayfish or in Panama City for many years. Should the Eastern indigo snake be observed or reintroduced in the Action Area in Bay County, the FDOT will need to consult with the FWS on projects in its habitat

This concurrence concludes consultation for the Eastern indigo snake, and is not further addressed in this PBO. The circumstances described in the Reinitiation Notice of this PBO that require reinitiation of consultation for the Action apply to any other species and critical habitats listed under the ESA.

4. STATUS OF SPECIES

This section provides an overview of the best available data about the biology and current condition of Panama City crayfish throughout its range that are relevant to formulating an opinion about the proposed Action. The Florida Fish and Wildlife Commission listed the Crayfish as a Species of Special Concern in 1987. The FWS published a proposed rule to list the species as threatened on January 3, 2018. We reopened the proposed listing rule, proposed critical habitat and a 4(d) rule listing on April 15, 2021. A final rule listing the Crayfish, a 4(d) rule, and designated critical habitat became effective February 4, 2022. *For a more complete in-depth review of the status of the Crayfish, see the FWS's Species Status Assessment (USFWS 2019 v.2).*

4.1. Species Description

The Crayfish is a small crayfish, growing to about two inches (body length minus claws). The color pattern consists of a medium-dark brown background color, lighter brown mid-dorsal stripe, and darker brown dorsolateral stripes (Figure 4.1.1). The lower lateral carapacial surfaces are lighter brown with reddish-brown spots. The Crayfish is an aquatic dependent invertebrate that inhabits wet pine flatwoods and prairie-marsh communities.

Figure 4.1.1. The Panama City crayfish, *Procambarus econfinae*, light form male, dorsal view (Photo credit: Dr. Ed and Lisa Keppner).

4.2. Life History, Distribution, and Numbers

It is known to historically occur within a 56 square mile area (Figure 4.2.1) of Panama City, Bay County, Florida. The Crayfish occur in burrows but will move into open water during wet seasons. The burrows are simple passages from 1 to 3 feet deep, depending upon the depth of the water table. The historic habitat of the Crayfish would have been wet pine flatwoods and wet prairies. Both these habitats are fire dependent ecosystems. All known locations of the Crayfish in the built, urban environment are located in hydrologically altered and fire suppressed landscapes, such as timbered lands, roadside ditches, power line rights-of-way, and remnant wet prairie. Several conservation sites for this species have been undergoing habitat restoration. All are located within or adjacent to the highly altered/hydrologically altered/built environment of Panama City or surrounding silvicultural areas.

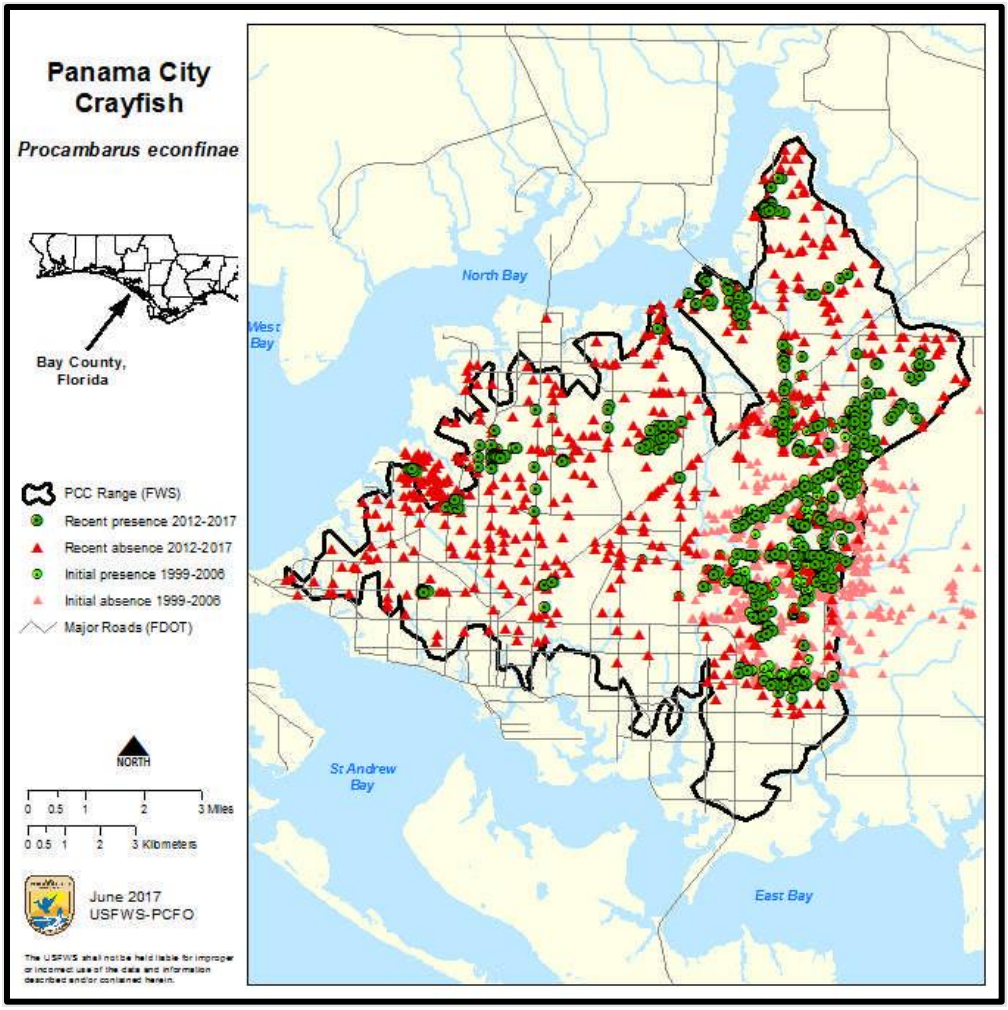

Figure 4.2.1. Panama City Crayfish range (thick black line) endemic to Bay County in northwest Florida. Depicted are occurrences and absences from initial surveys (1999-2006) and from recent surveys (2012-2015).

The proposed rule to designate the Crayfish as a species threatened under the ESA was dependent on a GIS analysis that used November 2016 Bay County, Florida Department of Revenue parcel layers, whereby we estimated undeveloped acres remaining in core and secondary soils. "Undeveloped" parcels include lands labeled cropland, improved agriculture, vacant industrial, vacant commercial, vacant residential, grazing, urban, utilities rights-of-way, and timberland. Sixty-one (61%) or 9,180 acres of historical core soils remain undeveloped, and 46% or 5,646 acres of secondary soils remain undeveloped. Averaging the losses of both core and secondary soils, we estimated in 2017, that 54% of the original lands historically available to the Crayfish remains potentially available for use by the Crayfish. FWS updated our estimates of habitat losses in 2021 using a modified species range which increased the amount of habitat considered historically available. Currently we estimate, pre-FDOT project, 10,682 acres of core soils and 4,966 acres of secondary soils which total 15,657.8 acres of habitat available for the Crayfish pre-project.

A landscape genetic analysis (Duncan et al. 2017) delineated twelve Habitat Units for the known Crayfish populations. The largest areas (Star and Transmitter East) likely contain multiple subpopulations. Suitable habitat is largely absent now at College Point, and Crayfish are functionally extirpated from College Point, Old Airport, and Minnesota sites based on recent surveys. Edwards is functionally isolated by roadways and industrial buildings.

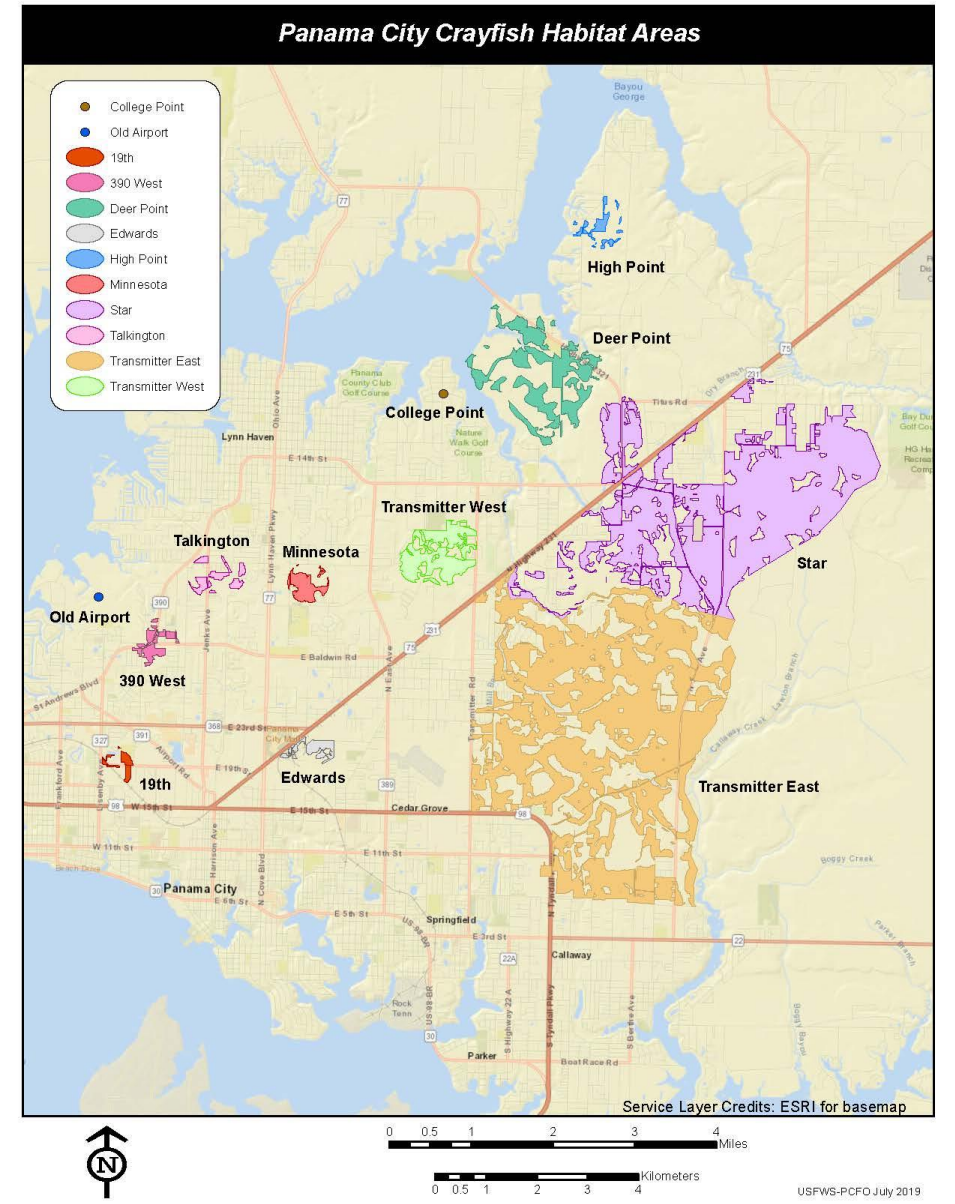

Figure 4.2.2. Twelve Habitat Units delineated for the Crayfish. Populations at College Point, Old Airport, and Minnesota are considered recently extirpated. The species recovery strategy does not include marginal populations at 390 West or Edwards so impacts to the remaining 8 habitat areas (Minnesota, Transmitter West, 19th St, Talkington, Deer Point, High Point, Star and Transmitter East) will be avoided wherever possible.

Our current lack of data on population size trends is the largest management issue, as we do not know which populations may be stable, increasing, or declining (or how quickly), complicating decision-making on potential conservation actions. Based on the overall trend of habitat loss, we have no reason to think that Crayfish populations are increasing. We do not know how many Crayfish populations exist within the **9** currently occupied habitat areas (the larger areas probably contain several isolated sub-populations), and we do not know their relative sizes or rates of growth or decline.

Previous surveys were designed to determine presence/absence, and cannot be used to calculate density, relative abundance, or population size trends (Table 4.2.1). Recent environmental conditions like rainfall seem to have a strong influence on detection probability, potentially biasing sampling results. Three sites are functionally extirpated at present, based on habitat conditions and survey results.

Table 4.2.1 Populations of the Crayfish with confirmed occupancy or recent extirpation.

Population Name	Confirmed Presence
19th	2018
Old Airport	Extirpated
390 West	2016
Talkington	2018
Minnesota	Extirpated (n=2 in 2015 n=0 in 2016)
Edwards	2016
Transmitter West	2016
College Point	Extirpated (n=0 in 2013, n=1 in 2016)
High Point	2016
Deer Point	2016
Star	2013
Transmitter East	2016

4.3. Conservation Needs and Threats

The largest threats to the future viability of this species relate to habitat loss and fragmentation that has resulted in isolated (and presumably small) populations with high inbreeding rates. We estimated in section 4.2 that 6,287 acres (42%) of core, and 5,325 acres (43%) of secondary soils remain undeveloped from historical levels. Within these suitable, non-fragmented soil habitat areas, the Crayfish needs suitable water quality, vegetation characteristics, and soil types which are described in greater detail in USFWS (2019). In summary, their habitat needs consist of:

1. Undeveloped lands, including cropland, improved agriculture, utilities rights-of-way, timberlands, or grazing lands that do or historically supported open wet pine flatwoods and wet prairie habitats that do, or can with management, support:

    a) appropriate herbaceous groundcover vegetation;

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

c) contain grassy, gently-sloped ground level swales with a 3:1 or shallower slope ratio.

2. Soil types within undeveloped lands that provide sediment structure needed for burrow construction; that support herbaceous vegetation needed for food and cover, and where the ground water is always within 3 feet of the ground surface. These soil types are defined as:

i. **core soils** for Panama City crayfish: (22) Pamlico-Dorovan Complex, (29) Rutlege Sand, (32) Plummer Sand, (33) Pelham Sand, (39) Pantego Sandy Loam, and (51) Rutledge- Pamlico Complex.

ii. **secondary soils** within 100 meters of primary soils: (1) Albany Sand, (12) Leefield Sand, (13) Leon Fine Sand, (31) Osier Fine Sand, and (36) Alapaha Loamy Sand.

which support native herbaceous vegetation such as, but not limited to, 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 sufficient quality to support all life stages of the Panama City crayfish and the herbaceous vegetation on which they rely. Preliminary data collected by FWC shows that Crayfish occur in waters:

a) with oxygen levels that range between 2-9 milligrams per liter;

b) with pH levels between 4.1 and 9.2;

c) with temperatures between 42 and 94 degrees Fahrenheit (5-34.4 Celsius) although optimum temperatures are thought to be in the range of 68-79^{o} Fahrenheit (20- 26^{o} Celsius).

While we do not have a precise estimate of the minimum viable population size or habitat area for Crayfish, species experts estimate that 2,200 acres of actively managed habitat that include protection for most populations listed in Table 4.2.2 should be enough for Crayfish to remain viable for the foreseeable future.

A priority for future work is to develop a monitoring plan that tracks population stability over time to help determine the minimum viable habitat area that supports a Crayfish population for the foreseeable future. A review of minimum viable population size (MVP) research studies shows a remarkably consistent population of about 5,000 individuals is necessary for most

terrestrial organisms, with the main exceptions being birds, marine fish, and broadcast spawning aquatic invertebrates that have very large ranges and require a much larger population size to cover them. For organisms less than 1 kg in body mass, the standardized MVP was 5,137 individuals, which we believe is the best available proxy for Crayfish (Traill et al., 2007).

Unfortunately, we do not know the total habitat area that an individual Crayfish population utilizes over its lifetime. Our mark-recapture efforts are most effective (though still imprecise) in isolated ditches or ephemeral ponds where traps can be deployed, and such areas are often only a 1/4 acre or less in size, surrounded by much larger areas of unsuitable terrestrial habitat. Thus far, our estimated population sizes at three sites have ranged from 34 to 623 Crayfish in overall habitat areas ranging from 3 to 232 acres. Thus, the minimum viable habitat area required to support a Crayfish population of 5,137 ranges from about 66 acres to several thousand acres, depending on which density estimates are used for the calculation. While additional field studies should help to narrow this range, our recovery scenario of 2,200 acres should suffice to support this species for the foreseeable future (Table 4.2.2).

Table 4.2.2. A future scenario showing 2,200 acres of protected Crayfish habitat, which should allow the Crayfish to persist for the foreseeable future.

Population Name (Habitat Units)	Currently Protected (acres)	Expected Newly Acquired Lands	Other Lands Needed	Protected & Mgt *Goal=2200 ac.
Minnesota	6	0	0	6
Transmitter West	86.5	148		200
19th Street	0	0	3	3
Talkington	38	0	0	38
Deer Point	90	0	≥10	100
High Point	10	31	1	41
Star	0	≥200	0	200
Transmitter East	0	≥1000	0	1000
Total	**230.5**	**1379**	**114**	**These plus additional to total 2,200 acres**

Most known Crayfish occurrences are in or near human-altered habitats, and are likely vulnerable to loss or further alteration. Although artificial habitats such as rights-of-way have allowed the Crayfish to persist, human activities can alter the hydrology and configuration of these sites, making long term Crayfish conservation difficult in these areas. For example, roadside ditch maintenance and construction activities have resulted in the destruction of several crayfish sites (Keppner and Keppner 2001, 2005).

Infrastructure development has impacted, and is anticipated to impact, several other sites (Keppner and Keppner 2001, 2005, Bay County Comprehensive Plan 2021). These projects can result in direct loss of habitat and additional issues such as fragmentation and isolation. Several proposed road construction or expansion projects may impact Crayfish habitat in the future.

Areas in silviculture adjacent to human-altered habitats may serve as refuges for Crayfish, and those who follow silvicultural BMPs minimize impacts to Crayfish (see Appendix 5 in FWC 2016). However, silvicultural practices such as ditching and bedding, roller chopping, installing fire breaks, and constructing roads can alter the hydrology of Crayfish sites, create physical barriers to Crayfish movement, and destroy underground burrows (Hobbs 2001; Keppner and Keppner 2001, 2005; FWC 2006). Fire suppression and high tree-density on silvicultural sites can reduce herbaceous groundcover necessary for suitable crayfish habitat (Keppner and Keppner 2001, 2005; FWC 2006).

4.4. Urbanization, Climate Change, and Sea Level Rise

Of the past, current, and future influences on what the Crayfish needs for long term viability, the largest threats to the future viability of the species relate to habitat loss and fragmentation that has resulted in isolated (and presumably small) populations with high inbreeding rates. Almost 60% of their historic habitat area has been lost to development already, approximately 25% is predicted to remain by 2050. Current lack of data on population size trends is the largest management issue, as we do not know which populations may be declining (or how quickly), complicating decision-making on potential conservation actions. While small direct losses of habitat are predicted due to sea level rise, other climate change related threats exist including direct and indirect impacts from increased temperatures, saltwater intrusion, increase hurricane frequency/intensity, and prolonged droughts. The Crayfish continues to be found within the boundaries of its historic range, though now, the loss of one population could result in significant range contraction.

4.5. Summary of Species Status

Panama City crayfish are extirpated from over half of their known, small geographic range, and most of their remaining habitat areas are in poor condition. Future development will likely result in extirpation from 75% of their range by 2030 and 85% by 2050 (USFWS 2017). If the remainder is protected from development and conservation efforts are focused in this small area, the species as a whole may be viable for the foreseeable future. However, Crayfish may soon be extirpated from the vast majority of their historical range if the remnant habitat areas in the western half of Panama City are developed.

5. ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the Crayfish, its habitat, and ecosystem within the Action Area. The environmental baseline is a “snapshot” of the species’ health in the Action Area at the time of the consultation and does not include the effects of the Action under review.

5.1. Action Area Numbers, Reproduction, and Distribution

From July-September 2021, the FWS reassessed habitat availability for use by the Crayfish with the following information: 2020 aerial maps, updated range boundary, original soil classifications, and Cooperative Land Cover version 3.4. Acres of habitat already permitted for loss, but not yet cleared of natural vegetation, were subtracted from available habitat totals (Table 5.1.1). We also summarized the current status of available habitats associated with the

eight Habitat Units targeted for recovery of the species. Occupied lands not associated with a Habitat Unit, are less important for recovery of the Crayfish. All remaining habitats, combining core and secondary soil types, equate to 15,657 acres. This number is 831 acres larger than the habitat estimates used in 2017, when we originally assessed the need for listing the Crayfish. This change is largely attributed to expansion of the range boundary used in this 2021 analysis. Protection of 2,200 acres total, of suitable habitats within 6-8 habitat units, is our goal to achieve recovery of the Crayfish.

Table 5.1.1. Status of Crayfish habitat available, Pre-FDOT ROW and Stormwater habitat impacts.

PCC Population Habitat Unit	Total Acreage of Population	Core Soils (acres)	Secondary Soils (acres)	Non-hydric soils (acres)**
19th	28.6	23.5	5.0	0.1
Talkington	89.9	66.6	23.2	0.1
Minnesota	62.2	45.3	14.1	2.8
Transmitter West	334.8	253.8	81.0	0.0
Deer Point	779.6	596.9	182.3	0.4
High Point (MMM)	81.4	79.1	0.0	2.3
Star	2,667.6	1,604.0	1,073.2	0.5
Transmitter East	4,923.3	3,054.8	1,868.3	0.3
Not in CH population*	6,680.3	4,958.5	1,719.7	2.1
Total	**15,657.8**	**10,682.5**	**4,966.8**	**8.5**

*Includes 390 West, College Point, Edwards, and Old Airport Habitat Units, not required for recovery

** Crayfish occurrences in non-hydric soils likely from an error in soil mapping.

FDOT provided the FWS with GIS shapefiles that summarized 717 acres of land within their ROW--523 already altered and 194 with minimal alterations. We, FWS, summarize that 606 acres of historic core and secondary soils historically occurred within FDOT's ROW. Future construction, current construction, and historic impacts within 606 acres are considered in this PBO. Much of the 606 acres are covered by existing roads and bike lanes with approximately 73.7 acres remaining in an unconstructed condition but often modified with ditches running alongside the roadway and bike lanes. Ditched areas are often vegetated in non-native grasses. However, ROW habitat associated with Tram Road within Habitat Unit "Transmitter East" remains in a largely unaltered condition with minimal ditching and mostly native vegetation. With the exception of a few residential homes and the State Veterans Nursing Home, the "Transmitter East "Habitat Unit remains mostly in timber lands, altered only by dirt roads and furrowing associated with tree plantings. The Crayfish have persisted under timber operations for more than 50 years. **Table 5.1.2** summarizes our estimates of the distribution of potential maximum likely impacts associated with FDOT's ROW lands from the 73.7 acres of expected impact.

For future stormwater ponds, all to be located outside of the western-range, Habitat Units targeted for recovery, we used FDOT's estimate of 0.5 mile from the ROW outer boundary to estimate a conservative future scenario of potential impacts. One-half mile buffer from FDOT's ROW intersect with three Habitat Units (Unit 5, Unit 7 and Unit 8). Per email and further explained within the critical habitat section of this document, FDOT expects no more 144 acres total of impact spread out proportionally amongst the three Habitat Units. This equates to no more than 54.2 acres of impact within Unit 5 (Deer Point), no more than 56.3 acres within Unit 7 (Star), and no more than 33.5 acres of impact within Unit 8 (Transmitter East). Stormwater treatment areas are likely to be located adjacent the ROWs, and therefore will often be placed amongst developed properties such as apartment buildings, residential homes, and commercial offices. These lands may be mowed or largely unmanaged but with some native vegetation sufficient for the Crayfish to persist, but not thrive, with the exception of land along Tram Road. **Table 5.1.2** summarizes our estimates of the distribution of potential maximum likely impacts associated with FDOT's ROW lands from the 73.7 acres of expected impact and 144.0 from stormwater construction. Total impacts from the project should will not exceed 217.7 acres.

Table 5.1.2. Distribution of impacts from ROW and Stormwater construction in each Habitat Unit.

Panama City Crayfish Habitat Units	ROW Impacts	Stormwater Impacts	Total Project Impacts
1 (19th)	0.0	0.0	0.0
2 (Talkington)	0.0	0.0	0.0
3 (Minnesota)	0.0	0.0	0.0
4 (Transmitter West)	0.0	0.0	0.0
5 (Deer Point)	2.6	54.2	56.8
6 (High Point)	0.0	0.0	0.0
7 (Star)	5.9	56.3	62.2
8 (Transmitter East)	43.6	33.5	77.1
Not in a recovery population*	21.6	0.0	21.6
Total	**73.7**	**144.0**	**217.7**

*Includes 390 West, College Point, Edwards, and Old Airport Habitat Units, populations not considered for recovery

Survey Data: The FWS along with FWC conduct periodic Crayfish surveys range-wide. We lack consistent survey records but occurrences for the 217.70 acres within FDOT ROW and future stormwater pond areas are likely associated with ditches and adjacent houses and commercial buildings and although vegetated, are unlikely to support substantive numbers of Crayfish. With the exception of Tram Road ROW, we expect low density of Crayfish within these habitat areas.

The current methods of capturing Crayfish require standing water, so estimating population sizes of this semi-terrestrial species across larger habitat areas or in dryer periods is challenging. In the absence of localized population estimates, the FWS used surrogate population estimates from the local Talkington Family Nature Preserve. Two attempts were made to estimate the Crayfish population size at the Talkington Preserve Habitat Unit located along Jenks Avenue

using mark-recapture techniques. In June and July 2018, population size estimates ranged from 35-574 individuals sampled from an area of approximately 2.5 acres.

Lacking specific estimates of Crayfish within most of the ROW and stormwater lands, and with the exception of the Transmitter East Habitat Unit, we expect that given the prior habitat disturbances, Crayfish numbers are at the lower range of population densities - 14 Crayfish per acre (35 individuals/2.5 acres =14 individuals per acre) of impact lost within the ROWs and stormwater ponds outside of the Transmitter East. For the Transmitter East Habitat Unit, we estimated the average individuals sampled across the 2.5 acres is 122 individual Crayfish per acre (average of 35 and 574 individuals/2.5 acres = 122 individuals per acre). We used these density estimates to anticipate the potential loss of individuals from habitat alterations for the proposed action - 14 Crayfish per acre at most areas, and 122 Crayfish per acre at Transmitter East.

6. EFFECTS OF THE ACTION

This section analyzes the direct and indirect effects of the Action on the Crayfish, which includes the direct and indirect effects of interrelated and interdependent actions. Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action but are later in time and reasonably certain to occur. Crayfish are known to be present in some of these areas and are reasonably certain to occur in others.

6.1. Effects of Proposed Project Action #1—Road Works

Using FWS analysis, up to 88 percent of the 606 acres of lands under FDOT jurisdiction includes existing paved roads, bike paths, sidewalks, and ditches. The remaining 73.7 acres of ROW include partially impacted habitat from dirt fill but continues to provide some suitable Crayfish habitat. This consultation includes <u>all</u> impacts associated with road right-of-way actions. While some Crayfish may reside, post-buildout, we expect eventual total loss, or Take, of Crayfish within the 606 acres of habitat from direct or indirect impacts, but we calculate impacts on 73.7 acres of habitat.

FDOT calculated 194 acres of impact within their ROW jurisdiction as depicted in Table 5.1.3. Impacts to PCC Core and Secondary Soils (Only Pervious Areas) shows the impacts to PCC soils (Core and Secondary) for the estimated maximum right-of-way of each state road (right-of-way to right-of way). However, this analysis excludes any coverage type that appears to be impervious and does not exclude pervious areas based on habitat potential. The Service is responsible for tracking amounts of available habitat remaining for the recovery of the Crayfish. We have therefore used our calculations to track estimated take based on expected impacts, with full loss of habitat within the ROWs. Likely the differences in numbers come from interpretations of pervious and impervious filter capabilities.

Harm due to the permanent loss of habitat, foraging areas, and prey resources will occur. Crayfish may also be killed or injured by equipment use during land clearing and direct covering of land with asphalt and concrete. Any road expansions may result in increased stormwater and pollutant discharge into Crayfish habitat (ditches in this case), reducing the quality of any

remaining edge habitat, which will be closer to the road following expansions of roads and associated facilities.

Quantification of impacts by existing and future fragmentation of habitat is an elusive process. Harm during clearance surveys, construction work, and increased pedestrian/bicycle traffic following the expansion is also likely to occur. Using the low-end population estimates of the from the Talkington Nature Preserve population's mark-recapture efforts, we assume an average population of 35 crayfish/2.5 acre habitat area to predict that 14 crayfish per acre will be lost.

Of the 606 acres historically located within the ROW, 73.7 acres remain vegetated and therefore Crayfish are reasonably certain to occur. We calculate 30.1 acres (Habitat Units 1-7) times 14 crayfish per acre impacted and 43.6 acres (Habitat Unit 8) times 122 crayfish impacted per acre. Therefore, in the 73.7 acres of expected ROW impacts, we estimate **5,319** Crayfish being taken in total.

6.2. Effects of Proposed Project Action #2—Stormwater Ponds

FDOT provided an estimate of acreage of expected impact from future stormwater ponds (Figure 5.1.3) for which FDOT commits to avoid impacts within those western-range Habitat Units that are needed for recovery (see specific commitments above). We therefore calculate the losses of habitat to the eastern population Habitat Units (5, 7 and 8) (Table 5.1.2) As explained in section 5.1, FDOT estimated 144 acres of impacts needed for future stormwater ponds spread proportionally amongst the three Habitat Units. While some Crayfish may persist, post-buildout, we anticipate total loss, or Take, of Crayfish within the 144 acres of habitat from direct or indirect impacts.

Table 5.1.3: Impacts to PCC Core and Secondary Soils (Only Pervious Areas) shows the impacts to PCC soils (Core and Secondary) for the estimated maximum right-of-way of each state road (right-of-way to right-of way). However, this analysis excludes any coverage type that appears to be impervious and does not exclude pervious areas based on habitat potential.

State Road ID	Impact to Soils (Acres)		Total PCC Soil Impacts (Acres)
	Core	Secondary Soils	
SR22	5.53	7.11	12.64
SR30	0.66	1.29	1.95
SR30A	8.95	4.90	13.84
SR75	13.84	15.55	29.39
SR77	6.78	8.60	15.38
SR327	0.61	4.63	5.24
SR368	4.09	3.31	7.40
SR389	4.42	7.64	12.06
SR390	17.94	24.60	42.55
SR391	2.12	1.46	3.58
GCPW	22.62	27.03	49.65
Core Soil Impacts			87.56 (0.32%)
Secondary Soil Impacts			106.11 (0.39%)
Total C/S Impacts			193.68

Harm due to the permanent loss of habitat, foraging areas, and prey resources will occur. Crayfish may also be killed or injured by equipment use during land clearing and direct covering of land with unnatural fill. Elevated berms, deeper waters, and fill materials often associated with stormwater ponds reduce the likelihood that Crayfish are able to persist in these features even though they appear compatible from a general standpoint. We are unaware of any stormwater features occupied by Crayfish. Harm during clearance surveys, construction work, and fill is also likely to occur.

Using the low-end population estimates from the mark-recapture study for Habitat Units 5 and 7, we estimated an average of 14 crayfish per acre will be lost. For Habitat Unit 8, we used an average of 122 crayfish per acre lost. **Table 5.1.2** demonstrates that an expected 144 acres of impact are to occur from development of the stormwater ponds which we estimate would result in 110.5*14=**1,547 and** 33.5*122=**4,087** for a total of **5,634** Crayfish taken by this portion of the project over time. The <u>total</u> of both the ROW <u>and</u> stormwater efforts are estimated to result in harm to **<u>10,953</u> Crayfish**.

6.3. Effects of Proposed Action #3— Recovery

FDOT commits to fund an endowment for the Crayfish. The interest generated from the endowment funds will help fund the conservation, habitat restoration and maintenance of lands set aside specifically for the Crayfish under public ownership or private easements. Priority land acquisition may also be considered. Given the commitment from FDOT that the maximum distance from existing roads that ponds would be placed will be limited to 0.5 acres, USFWS will attempt to situate future easements or land acquisitions outside of these limits to the extent possible. Given that only 20% of impacts were considered, there remains 80% more land to provide flexibility in stormwater placement. FWS and the state of Florida are currently assessing acquisition of land within Habitat Unit 5 that occurs within the ½ mile ROW. Currently, the FWS and FWC manage up to 200 acres of habitat. When appropriately managed, Crayfish thrive in such habitats due to improved native vegetation structures and the availability of small amounts of shallow standing water that are not deep enough to support Crayfish predators. Such water features are needed by the Crayfish to fulfil their life cycle and are extremely rare in areas with human activities. While it is difficult to quantify the benefits of these future habitat improvements, we expect the funds that furnish acquisition and management actions will contribute directly towards Crayfish recovery and are a critical component of long-term persistence of the species.

Additionally, the potential for the Service and/or FWC to capture and relocate Crayfish from the ROW and stormwater pond locations could help support recovery.

7. CUMULATIVE EFFECTS

For purposes of consultation under ESA §7, cumulative effects are those caused by future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area. Future Federal actions that are unrelated to the proposed action are not considered, because they require

separate consultation under §7 of the ESA. The FWS is not aware of any specific plans within the Action Area that would not be covered under §7.

In its request for consultation, FDOT did not describe, and the Service is not aware of, any future non-Federal activities that are reasonably certain to occur within the Action Area. Therefore, we anticipate no cumulative effects that we must consider in formulating our opinion for the Action.

8. CONCLUSION FOR LISTED SPECIES IN THE ACTION AREA

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of a BO under §7(a)(2) of the ESA, which is to determine whether a Federal action is likely to:

a) jeopardize the continued existence of species listed as endangered or threatened; or
b) result in the destruction or adverse modification of designated critical habitat.

"Jeopardize the continued existence" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02).

Table 5.1.1 depicts the approximate amount of habitat available per Habitat Unit for each recovery population prior to FDOT's expected maximum impacts. **Table 8.1** depicts the remaining habitat within each Habitat Unit for each recovery population. Post-construction, assuming full loss of 217.7 acres (73.7 ac ROW and up to 144 ac stormwater ponds), over 15,000 acres of habitat remains available for the Crayfish. We aim to eventually protect and manage at least 2,200 acres of Crayfish habitat, which should recover the species.

8.1.1. Table demonstrates Pre- and Post- FDOT impact analysis of Crayfish habitat loss.

PCC Population Habitat Unit	Habitat (acres)	FDOT Removed acres)	Post-construction (acres)
1 (19th Street)	28.6	0.0	28.6
2 (Talkington)	89.9	0.0	89.9
3 (Minnesota)	62.2	0.0	62.2
4 (Transmitter West)	334.8	0.0	334.8
5 (Deer Point)	779.6	56.8	722.8
6 (High Point)	81.4	0.0	81.4
7 (Star)	2,677.6	62.2	2,615.4
8 (Transmitter East)	4,923.3	77.1	4,846.2
Not in a recovery population*	6,680.3	21.6	6,658.7
Total Remaining Habitat	**15,657.8**	**217.7**	**15,440.1**

*Includes 390 West, College Point, Edwards, and Old Airport Habitat Units, not required for recovery.

After reviewing the current status of Crayfish populations, the environmental baseline for the action area, the effects of the proposed action and potential cumulative effects, it is the FWS's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the proposed Panama City crayfish.

9. CRITICAL HABITAT FOR PANAMA CITY CRAYFISH

This section provides the Service's biological opinion of the Action for designated critical habitat for the Panama City crayfish in the Action Area. The ESA defines critical habitat as the specific geographic areas that contain features essential to the conservation of an endangered or threatened species that may require special management and protection. Critical habitat may also include areas not currently occupied by the species but needed for its recovery. No habitat was considered unoccupied within the Crayfish critical habitat designation.

9.1. Status of Critical Habitat

This section summarizes best available data about the condition of all designated units of critical habitat for the Panama City crayfish (*Procambarus econfinae*) (Crayfish) that are relevant to formulating an opinion about the Action. The Service published its decision to designate critical habitat for the Crayfish on January 5, 2022 [87 FR 546-581]. The FWS did not propose nor designate critical habitat within any FDOT ROW areas with the exception of stormwater ponds because the exact location for these ponds are unknown at this time. Therefore, its applicable that we only address impacts associated with future stormwater ponds in the following sections and no FDOT ROW lands.

Designated Crayfish Critical Habitat Units (Units) include areas within its historic range that support eight (8) subpopulations within their associated habitat types- historically prairies or pine flatwoods. The Crayfish are non-migratory, therefore are present year around within each Unit. The eight Units comprise 4,037 acres (1,633 hectares (ha)) of land, entirely within Bay County, Florida (**Table 9.1.1**). They are named by adjacent street names or local sites and as referenced within the Species Status Assessment (FWS 2019; version 2). Five Units are within FDOT's potential impact footprint (19th Street, Talkington, Deer Point, Star, and Transmitter East) for stormwater pond placement. FDOT has committed to avoiding stormwater management impacts to the Talkington and 19th Street Units, so we address future impacts to critical habitat within the remaining three Critical Habitat Units.

9.1.1. Table of Panama City crayfish critical habitat units by name, ownership and area.

GROUP	UNIT	UNIT NAME	LAND OWNERSHIP (AC.)		FINAL TOTAL CRITICAL HABITAT AREA (AC.)
			PRIVATE	STATE/ LOCAL	
Western	1	19th Street	19.45	3.7	23.17
	2	Talkington	33.08	4.09	37.17
	3	Minnesota	19.07	29.96	49.02
	4	Transmitter West	179.61	2.21	181.82
Eastern	5	**Deer Point**	274.31	4.51	278.82
	6	High Point	36.28	0.51	36.79
	7	**Star**	1,417.8	6.49	1,424.29
	8	**Transmitter East**	2,057.47	49.92	2,107.38
		TOTAL AREA	**4,037.07**	**101.40**	**4,138.47**

Note: Areas estimate reflect all land within critical habitat unit boundaries; Area sizes may not sum due to rounding. The Action Area may impact the three units in bold font.

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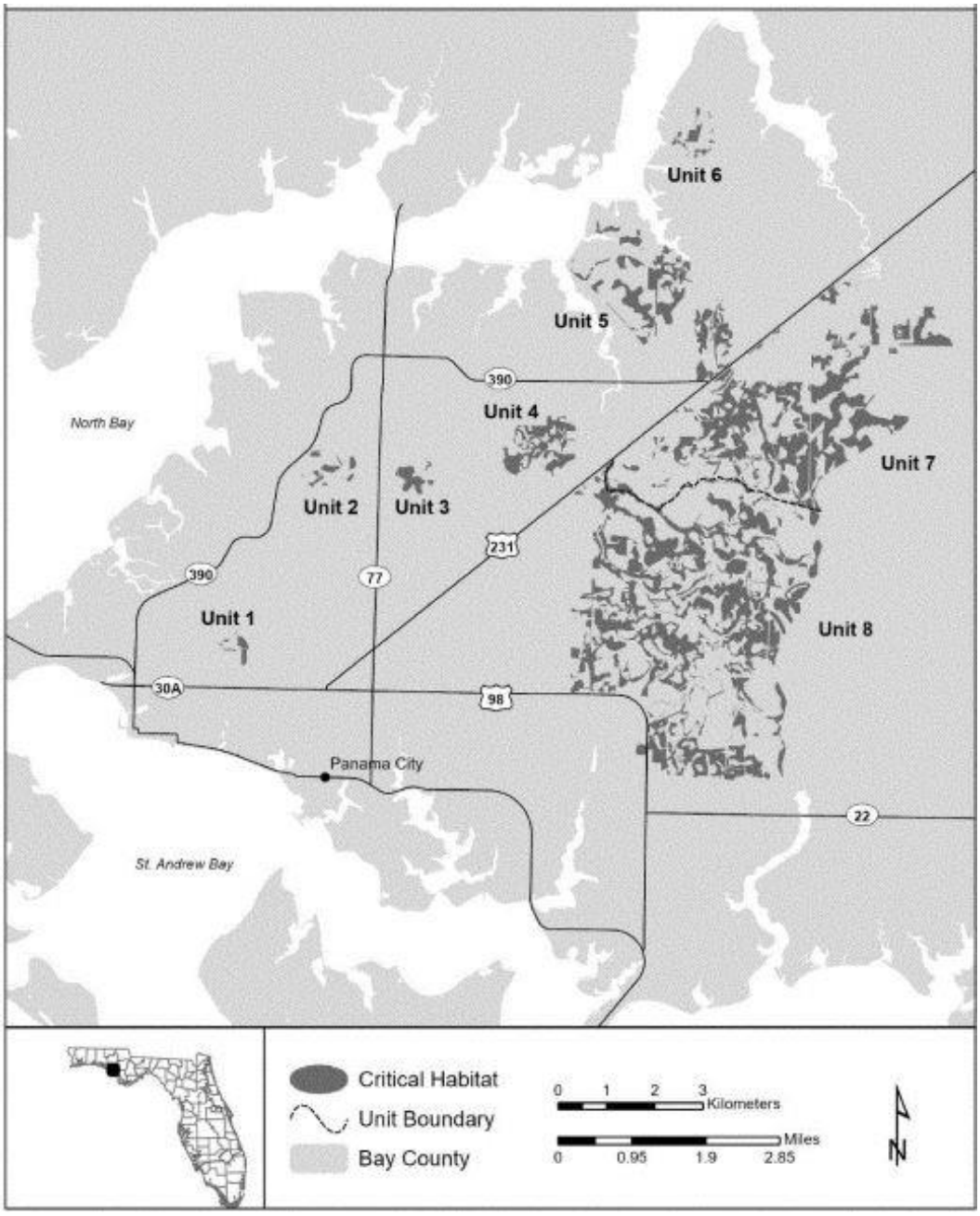
9.1.2. Figure of Panama City crayfish critical habitat indicated by unit numbers.



9.1.3. Critical Habitat Description

Critical habitat determinations focus on those physical and biological features (PBFs, also once referred to as primary constituent elements) that are essential to the conservation of the species

(50 CFR 424.12; https://www.law.cornell.edu/cfr/text/50/424.12). General physical and biological features needed to sustain the life processes of the Crayfish include:

- Space for individual and population growth and normal behavior; cover or shelter.
- Food, water, air, light, minerals, or other nutritional or physiological requirements.
- Sites for breeding and rearing offspring.
- Habitats protected from disturbances, or which represent the historical, geographical, and ecological distributions of a specie.

Specifically, we have determined that the following PBFs (87 FR 565-566) are essential to the conservation of the Crayfish and are the same for all eight critical habitat units designated in the 2022 rule and will not be repeated in each CH description:

(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 (depth usually less than one 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. Theses soil types include: (a) Core soil for Crayfish include Pamlico-Dorovan Complex, Rutlege Sand, Plummer Sand, Pelham Sand, Pantego Sandy Loam, and Rutledge-Pamlico Complex; (b) Secondary soil within 50 feet (15 meters) of core soils: (1) Albany Sand, Leefield Sand, Leon Fine Sand, Osier Fine Sand, and Alapaha Loamy Sand; and (c) Soils that currently, or can eventually, support native herbaceous vegetation.

(3) Undeveloped lands that contain surface and groundwater of sufficient quality to support all life stages of the 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 (^{o}F)(5 and 34.4 degrees Celsius (^{o}C)), although optimum temperatures are thought to be in the range of 68 and 79 ^{o}F (20 to 26 ^{o}C) (Butler et al. 2003).

Federal agencies must ensure that their activities are not likely to result in the destruction or adverse modification of designated critical habitats. Therefore, proposed actions that may affect designated critical habitat require an analysis of potential impacts to the PBFs.

9.1.4. Conservation Needs and Threats

Currently, the greatest threat to the survival and recovery of the Crayfish relates to habitat loss and fragmentation that has resulted in isolated (and presumably small) populations with high inbreeding rates. We estimate in section 4.2, 10,682 acres of core soils and 4,966 acres of secondary soils which total 15,657.8 acres of habitat available for the Crayfish pre-project.

Climate change has potential implications for the Crayfish through alteration of habitat conditions. Both droughts and floods could become more frequent and more severe, which would affect surface water temperatures, water quality and clarity, and other features important to Crayfish conservation. More detailed information on habitat threats is found in section 4.3-4.4.

Stabilizing or increasing the populations within 6-8 Crayfish CH Units and attaining 2,200 acres of habitat under permanent conservation are the primary recovery objectives outlined in the recovery outline (FWS draft, March 2022) for the Crayfish. The Recovery Plan for the Crayfish is to be completed by 2023. The recovery outline (FWS draft, March 2022) emphasizes: (1) Permanent protection and improvement of 6-8 populations of the Crayfish and their habitats to abate small populations and inbreeding; (2) enhancement and restoration of those habitats; and (3) improved population monitoring and population management, including augmentation and reintroduction; if needed, over time to obtain these recovery objectives.

9.2. Environmental Baseline for Panama City Crayfish Critical Habitat

This section describes the best available data about the condition of critical habitat units in the Action Area without the consequences caused by the proposed Action. FDOT ROWs were not included in critical habitat; therefore, no impacts are addressed in this analysis.

Many considerations are required for stormwater pond placement. FDOT engineers place the ponds adjacent to their ROWs or within one-half mile of their ROWs depending on elevation, slope, and soil structure. One-half mile distances from FDOT's ROW intersect with three CH units and total 719 acres. Per email, FDOT expects no more than 20 percent to be impacted which equates to 144 acres. We allocate acres (20 percent) proportional coverage: Unit 5 (Deer Point) with approximately 270 acres is to have not more than 54.2 acres affected, Unit 7 (Star) with approximately 281 acres will have no more than 56.3 acres affected, and Unit 8 (Transmitter East) with approximately 167 acres to have no more than 33.5 acres affected. FDOT commits to not impacting the remaining CH units, therefore none are addressed within this consultation. The determination of the exact acres of impacts due to future construction of stormwater ponds within these three CH units will take place at the time of obtaining a permit for their construction so FWS can track habitat loss, but the total impacts spread among all 3 CH units will not exceed 144 acres. FDOT is to reinitiate if they exceed this amount.

<u>Unit 5: Deer Point [Figure 9.1.2]</u>
The Deer Point unit occurs on a peninsula located near Bay County road 2321 in Lynn Haven and Panama City, FL (Figure 9.2.1). It is supported by 278.8 acres of habitat. Four privately owned easements lie within or are adjacent to areas included in this unit. These easements protect 95 acres of core and secondary soils, although some of the soils do not meet the criteria for inclusion within CH due to distance from core soils. The City of Lynn Haven holds a 90 acre easement that has partial use for passive recreation such as walking trails, restrooms, and playground facilities. FDEP holds three easements totaling 35.0 acres on lands still in private ownership. 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 the easements that meet the criteria are included as CH. All need regular management, especially the lands with dense vegetation. Herbaceous groundcover is spotty, and shallow pools of water are small and unreliable, often caused by vehicle tracks, and too deep for the Crayfish. Crayfish occurrences was documented on easement lands in 2012 and 2014-2018.

All of the essential physical and biological features (PBFs) described in section 9.1.2 are found within the unit.

Unit 7: Star [Figure 9.1.2]
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 Crayfish population in the unit is supported by 1,424.3 acres (576.4 ha) of habitat. 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.

All of the essential physical and biological features (PBFs) described in section 9.1.2 are found within the unit.

Unit 8: Transmitter East [Figure 9.1.2]
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.

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. In early March 2022, an extensive wildfire event burned hundreds of acres of habitat within this unit. Most of the fire was on private lands, so access is not readily available to assess damage that likely occurred from plow lines during wild-fire control efforts. Likely there were benefits gained from debris reduction which will stimulate herbaceous vegetation, but also losses from plowing are expected.

All of the essential physical and biological features (PBFs) described in section 9.1.2 are found within the unit.

9.3. Effects of the Actions on Panama City Crayfish Critical Habitat

In a BO for designated critical habitat, the effects of the proposed action are all reasonably certain consequences to its physical and biological features caused by the action, including the consequences of other activities caused by the action. Activities caused by the action would not occur but for the action. Consequences to critical habitat features may occur later in time but are

limited to portions of the designation that occur within the action area. Future placement and detailed sizes of stormwater ponds is expected to be less than 144.0 acres of impact. Exact locations and exact impacts are unknown. We therefore apportioned an approximate 144 acres of impact proportional the amount of habitat adjacent the ROW within the 3 Habitat Units that contain critical habitat. We analyzed a scenario considering greatest impacts of their potential effects on the Crayfish. The determination of the exact acres of impacts due to future construction of stormwater ponds within these three CH units will take place at the time of obtaining a permit for their construction so FWS can track habitat loss, but the total impacts spread among all 3 CH units will not exceed 144 acres. FDOT is to reinitiate if they exceed this amount. We will update the actual impacts of unknown, future sites in order to provide FDOT consultation flexibility now; we plan to track habitat availability with real, geo-referenced information.

Harm from the permanent loss of habitat, foraging areas, and prey resources will occur. Insufficient PBF's will remain, following build out to support a viable Crayfish population. Elevated berms, deeper waters, and fill materials often associated with stormwater ponds reduce the likelihood that the PBF's Crayfish require are able to persist in these features even though they appear compatible from a general standpoint. We are unaware of any stormwater features occupied by Crayfish.

Direct habitat loss will occur due to the addition of stormwater ponds regardless of construction methods. Excavation of surface layers much greater than three feet deep, and removal of native herbaceous vegetation is unavoidable. The direct impacts from construction will consist of altered soil functions needed for burrowing, habitat quality with use of non-native groundcover that will replace native groundcover, loss of cover, and lost foraging habitat features. Improved water quality will occur once the stormwater ponds function as their purpose and functionality is to filter run-off from adjacent roadways before filtering to the ditch system or groundwater.

9.3.1. Table of Panama City crayfish critical habitat units by name, ownership and Area pre- and post- impact analysis.

GROUP	UNIT	UNIT NAME	TOTAL CRITICAL HABITAT AREA (AC.) PRE-PROJECT	TOTAL CRITICAL HABITAT AREA (AC.) POST-PROJECT
Western	1	19th Street	23.17	23.17
	2	Talkington	37.17	37.17
	3	Minnesota	49.02	49.02
	4	Transmitter West	181.82	181.82
Eastern	5	**Deer Point**	278.82	**(-54.2 ac) =** 224.62
	6	High Point	36.79	36.79
	7	**Star**	1,424.29	**(-56.3 ac) =** 1,367.99
	8	**Transmitter East**	2,107.38	**(-33.45ac) =** 2,073.93
		TOTAL AREA	**4,138.47**	**(-144) = 3,994.51**

9.4. Cumulative Effects on Panama City Crayfish Critical Habitat

In section 3, we did not identify any activities that satisfy the regulatory criteria for sources of cumulative effects except unevaluated impacts, good and bad, from the wildfires that occurred earlier this month within Transmitter East CH unit. Therefore, cumulative effects to critical habitat are not relevant to formulating our opinion for the Action.

9.5. Conclusion for Panama City Crayfish Critical Habitat

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of the BO for critical habitat, which is to determine whether the Action is likely to result in its destruction or adverse modification.

The proposed action has the potential to affect the following PBFs of critical habitat in Unit 5, 7 and 8 within the Crayfish range: 1) Undeveloped 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 (depth usually less than one 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; and 3) Undeveloped lands that contain surface and groundwater of sufficient quality to support all life stages of the Crayfish and the herbaceous vegetation.

No more than 144 acres of permanent loss of habitat is expected and this number is likely exaggerated. However, sufficient habitat will remain to meet the needs of the Crayfish. Just under 4,000 acres of CH remains available to achieve the 2,200 acres of habitat needed for recovery of the Crayfish. The proposed project is not likely to appreciably diminish the critical habitat's capability to provide the intended conservation role for the Crayfish overall. After reviewing the status of the critical habitat, the environmental baseline for the Action Area, the effects of the Action, and the cumulative effects, it is the Service's biological opinion that the Action is not likely to result in the destruction or adverse modification of designated critical habitat for the Crayfish.

10. INCIDENTAL TAKE STATEMENT

ESA §9(a)(1) and regulations issued under §4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA §3). In regulations at 50 CFR §17.3, the FWS further defines:

- "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife

by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering;" and

- "incidental take" as "any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

For the exemption in ESA §7(o)(2) to apply to the Action considered in this PBO, the FDOT must undertake the non–discretionary measures described in this ITS, and these measures must become binding conditions of any permit, contract, or grant issued for implementing the Action. FDOT has a continuing duty to regulate the activity covered by this ITS. The protective coverage of §7(o)(2) may lapse if the FDOT fails to: assume and implement the terms and conditions; or require a permittee, contractor, or grantee to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit, contract, or grant document.

The Service revokes the monitoring requirement for Crayfish within the Project Area. We expect all Crayfish and habitat within the acreage of expected impacts to be permanent. The authorized impacts will not lead to jeopardy, or preclude recovery. The proposed actions, primarily the endowment for acquisition and management of recovery populations, will offset the loss of habitat and connectivity in the right-of-ways and stormwater pond features. The Service is to plan and conduct monitoring efforts of the populations needed for recovery. If FDOT proposes impacts out of the current/future right-of-ways and stormwater facilities as described in this document, we expect FDOT to assess and consult on any potential adverse effects to Crayfish at that time.

Further, as any future easements to support Crayfish habitat are identified for purchase, USFWS will **attempt** to avoid easements within 0.5 miles of the road right of way and will coordinate with FDOT on these locations. This will help ensure placement of future easements does not conflict with future road projects.

10.1. Amount or Extent of Take

As described above (Effects of the Action), we estimate that up to ***10,953*** Crayfish will be taken by various activities associated with this transportation program in Bay County. The incidental take is expected to be in the form of temporary direct and indirect impacts resulting from construction activities and permanent loss of habitat. Our estimate is based on an imprecise measurement of Crayfish population densities based on a current population estimate. No more than 144 acres of CH habitat spread amongst three CH units are to be impacted. Post-construction, just under 4,000 acres of CH habitat remains available to the Crayfish.

Table 9.1.1. The number of individuals affected by the proposed project, based on the best available commercial and scientific information.

Species	Individuals	Form of take
Panama City Crayfish	10,953	Harm

10.2. Reasonable and Prudent Measures

The FWS believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take of the Crayfish and its habitat. Each RPM will be implemented by associated terms and conditions given in the section to follow. The FDOT, as the action agency, shall assure that the following RPMs, with their associated terms and conditions are implemented.

RPM 1: FDOT and their Contractors shall reduce impacts to Crayfish habitats to the maximum extent practicable.

No other RPMs are necessary given the thorough and early coordination with the FWS and FWC to complete this early programmatic consultation.

10.3. Terms and Conditions

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FDOT must comply with the terms and conditions (T&Cs) of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory. As necessary and appropriate to fulfill this responsibility, the FDOT must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

It's noted that the ESA requires monitoring efforts associated with expected take allotted to individual species and their habitats. Given the generous commitments via Conservation Measures by FDOT, the FWS waives the species monitoring responsibilities. The FWS and FWC will conduct species monitoring throughout their range after finalizing a species-wide monitoring plan as committed to in a Partnership Agreement signed in July 2019, between both agencies; therefore, monitoring will not be necessary. The FDOT, as the lead federal agency, shall assure that the following terms and conditions are implemented.

T&C1: FDOT is to comply with Project Actions as summarized in their BA [FDOT BA 2021] and sections 2.2, 2.3, and 2.4 within this document. FDOT is to comply with all Conservation Measures as summarized in their BA and sections 2.2.1, 2.3, 2.3.1, 2.4. and 2.41 within this document and Appendix 1.

T&C2: FDOT is allotted stormwater pond construction impacts up to 144 acres within one-half mile adjacent their ROW lands with the commitment to impact only Star, Transmiter East and Deer Point CH Units or in non- CH areas. The FDOT is to provide storm-water

pond placements (preferably in a Geographical Information System's (GIS) format) so the FWS can track habitat loss more accurately as it occurs.

T&C3: FDOT will follow FDOT Standard Specifications for Road and Bridge Construction 981-3 Sod. 981-3.1 Types which states "*Any netting contained within the sod must be certified by the manufacturer to biodegrade within one year*." These materials are found to persist on the landscape and create hazards for species, including the Crayfish, unless binding materials are manufactured with materials that do not persist following installation. Exceptions to this condition may be approved by the FWS on a case-by-case basis.

T&C4: FDOT will provide $3.5 million to an established endowment fund structured by FWS and the National Fish and Wildlife Foundation. FDOT will attempt to make the contribution within 6 to 12 months, but has up to 18 months after receiving a letter from USFWS that the endowment has been established. If payment is not made within the 6 to 12 months, FDOT will provide USFWS an update on the status of the payment.

T&C5: Upon locating a dead, injured, or sick individual of an endangered or threatened species, notification must be made to the Fish and Wildlife Services Field Office at Panama City, Florida at (850) 769-0552 within 48 hours. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

11. CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species. The FWS offers the following recommendations that are relevant to the listed species addressed in this PBO and that we believe are consistent with the authorities of the FDOT.

1. The FWS encourages the FDOT to plant native cypress trees within the water line or maintenance berm of their stormwater ponds (consistent with the ERP handbook of acceptable plants/shrubs/trees for planting of the littoral zone of a wet detention pond) to create potential habitat for the Crayfish as well as migratory birds, and other native species. This may result in beneficial habitat; however, we recognize the primary purposes of stormwater facilities are to treat stormwater, and some components of stormwater may not be congruent with Crayfish, e.g., heated storm runoff, copper, and other metal contents of roadway deposition. If this is not feasible, FDOT could allow the FWS or their volunteers to do so, contingent on this action not affecting the intents and purposes of the stormwater facility.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of these conservation recommendations.

12. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR 402.16, FDOT shall request reinitiation of consultation if the FDOT retains discretionary involvement or control over the Action (or is authorized by law) when:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this PBO; FWS will **attempt** to situate conservation easements under their purview in areas outside 0.5 miles from the road right of way and FDOT has agreed to place ponds no further than 0.5 miles from the road right of way. Therefore future actions under FDOT purview that would directly impact lands under existing, meaning at the time of this BO signature,or future conservation easements that contribute to Panama City Crayfish recovery may require reinitiation depending on their importance to Crayfish recovery;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this PBO; or
d. a new species is listed or critical habitat designated that the Action may affect.

In instances where the amount or extent of incidental take is exceeded, the FDOT is required to immediately request a reinitiating of formal consultation. Please note that the FWS cannot exempt from the applicable ESA prohibitions any Action-caused take that exceeds the amount or extent specified in the ITS of this PBO that may occur before the reinitiated consultation is concluded. The above findings and recommendations constitute the report of the Service. If you have any questions about the consultation, please contact Patty Kelly of this office at 850-769-0552.

13. LITERATURE CITED

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14. APPENDIX I.[1]

Conservation Measures, Commitments, and Terms and Conditions for[2]:

A Programmatic approach for Florida Department of Transportation Activities Within Panama City Crayfish Habitat Bay County, FL

FWS Log # 04EF3000-2021-FC-0629
June 2022

Conservation Measures from FDOT Biological Assessment (FDOT BA, March 2021)[2]

GENERAL: FDOT will adhere to the Best Management Practices (BMPs) found in:

- FDOT Standard Specifications for Road and Bridge Construction[3], Section 7-1, 7-2, 104, and 110
- State of Florida Erosion and Sediment Control Manual[4],
- FDOT Design Manual[5],
- FDOT permits from state and federal agencies with standard and specific conditions addressing BMPs.

1. **STORMWATER PONDS (BA mod in BO)**: Conservation Measure #1 from BA replaced with Conservation Measures for Stormwater ponds noted below from Biological Opinion.

2. **ROADWORKS AND STORMWATER CONTROL PONDS**: FDOT will follow Spec 7-1.4 (See FDOT 2021 BA Appendix 1) regarding the staging of equipment and materials to avoid impacts to Panama City Crayfish (*P. econfinae)* habitat and commit to not allowing the staging of any equipment or materials within areas designated as Critical Habitat should it be designated.

1 Numbering and bullets match source document.
2 Some Conservation Measures or Conservation Commitments may be repeated in BO Terms and Conditions.
3 FDOT Standard Specifications for Road and Bridge Construction Manual is updated biannually. The most current version of the manual shall be used for the related action.
4 State of Florida Erosion and Sediment Control Manual is updated occasionally. The most current version is to be used for related actions.
5 FDOT Design Manual is updated yearly, the most current version is to be used for the related action.

3. **ROADWORKs:** FDOT will notify[6] USFWS and FWC 6 months in advance of construction projects to allow for adequate time for those agencies to conduct a relocation should they desire. FDOT will not participate in the relocation event and the event cannot interfere with FDOT project construction schedules and must be completed prior to the onset of construction activities.

   Road works[6]: Notification to FWS and FWC of actions going to construction **will not** include regular maintenance activities and/or notification to the agencies may be significantly reduced based on timing of the action. Surveys and captures will be completed prior to the onset of construction activities.

4. **MAINTENANCE activities**: FDOT will continue to follow these conservation measures as it has since the initial FWC Draft Management Plan from 2007 *(these are also the same conservation measures in the Biological Opinion for Project Action #1):* Existing box-cut ditches are not considered Crayfish habitat and are exempt from these maintenance conservation measures.
   - Maintain ditches with side slopes equal to or greater than 3 feet horizontal to 1 foot vertical; 4 feet horizontal to 1 foot vertical preferred.
   - Maintain ditches with rounded bottoms. Avoid creating box cut ditches.
   - If possible, perform ditch maintenance when no standing water is present.
   - Re-vegetate side slopes as soon as possible with low-growing grasses, sedges and herbs.
   - Ditches should be mowed with little or no rutting. Boom arm mowers are preferred to reduce rutting from equipment.
   - Remove no more than 12 inches of soil during ditch maintenance procedures.
   - Existing box-cut ditches are not considered Panama City Crayfish (*P. econfinae)* habitat and are exempt from these maintenance conservation measures.

Note: Many maintenance activities are rapid deployment or emergency activities due to a weather event or an issue that needs to be addressed as soon as possible to prevent or relieve flooding within FDOT right-of-way. Due to limited staff, FDOT Maintenance does not have specific work crews assigned to ditch maintenance and it is not feasible to give advanced notice to wildlife agencies concerning this type of maintenance work[6.]

STORMWATER PONDS: Commitments for Project Action #2 in BA and BO

e. No stormwater ponds will be placed within (or near enough to impact) the smaller Talkington and 19th Street populations.
f. A maximum distance from existing roads that ponds would be placed will be limited to 0.5 miles from DOT ROW lands (excluding Talkington and 19th Habitat Units).
g. Ponds may be required within the Transmitter East units near Tram Road; however, they will be prioritized on the south side where habitat is less important for Crayfish recovery goals.

6 Notification to USFWS and FWC of actions going to construction will not include regular maintenance activities and/or notification to the agencies may be significantly reduced based on the time of the action.

h. Ponds may be required within the Star and Transmitter East Habitat Units in habitat that parallels Highway 231.

STORMWATER PONDS: Conservation Measures for Project Action #2 in BA and BO

d) FDOT will consider the location, size, and shape of future stormwater facilities (ponds, ditches, swales) to avoid or minimize impacts to Critical Habitat Units.
e) FDOT will follow Spec. 7-1.4 (see Appendix 1, FDOT BA, Crayfish Programmatic, 2019) regarding staging of equipment and materials to avoid impacts to Crayfish habitat and commit to not allowing the staging of equipment or materials within areas designated as Critical Habitat.
f) FDOT will notify the FWS and FWC six (6) months in advance of construction projects to allow for appropriate time for agencies to conduct capture and relocation of Crayfish from project areas should FWS or FWC decide to do so but will not rely on the assistance of FDOT in any manner. Surveys and captures by FWS or FWC must be completed prior to the onset of construction activities.

GENERAL- ONE TIME: Endownment Contribuiton and Reinitiation Clause: in BA and BO--Conservation Measure for Project Action #3

FDOT commits to contribute $3.5 million dollars to a FWS structured endowment fund for the conservation of the Crayfish to be utilized in the long-term conservation of the species, contingent upon the efforts summarized in paragraph 2.4 Project Action #3. FDOT will attempt to make the contribution within 6 to 12 months, but has up to 18 months after receiving a letter from FWS that the endowment has been established. If payment is not made within the 6 to 12 months, FDOT will provide FWS an update on the status of the payment. In recognition of the benefits of the FDOT contribution and implementation of the proposed Conservation Measures, no further consultation will be required for any FDOT action that will occur within the existing or future right-of-way along the SHS in Bay County, Florida, within the designated species range of *P. econfinae* as described within this BO. Exceptions that may trigger re-initiation are found in Section 12: Reinitiation Notice. This programmatic approach will remain effective until the species is recovered which is defined as "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act" (50 CFR §402.02).

Terms and Conditions in the BO (FWS 2022):

T&C2: **STORMWATER PONDS:** FDOT is allotted stormwater pond construction impacts up to 144 acres within one-half mile adjacent their ROW lands with the commitment to impact only Star, Transmiter East and Deer Point CH Units or in non- CH areas. The FDOT is to provide storm-water pond placements (preferably in a Geographical Information System's (GIS) format) so the FWS can track habitat loss more accurately as it occurs.

T&C3: **STORMWATER PONDS and ROW Grass:** FDOT will follow FDOT Standard Specifications for Road and Bridge Construction 981-3 Sod. 981-3.1 Types which states "*Any netting contained within the sod must be certified by the manufacturer to biodegrade within one year*." These materials are found to persist on the landscape and create hazards for species, including the Crayfish, unless binding materials are manufactured with materials that do not persist following installation. Exceptions to this condition may be approved by the FWS on a case-by-case basis.

T&C4: **GENERAL-One TIME REQUIREMENT**: FDOT will provide $3.5 million to an established endowment fund structured by FWS and the National Fish and Wildlife Foundation. FDOT will attempt to make the contribution within 6 to 12 months, but has up to 18 months after receiving a letter from USFWS that the endowment has been established. If payment is not made within the 6 to 12 months, FDOT will provide USFWS an update on the status of the payment.

T&C5: **GENERAL- all times:** Upon locating a dead, injured, or sick individual of an endangered or threatened species, notification must be made to the Fish and Wildlife Services Field Office at Panama City, Florida at (850) 769-0552 within 48 hours. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

FWS Biological Opinion Appendix I. Citations:

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