

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

[Docket No. FWS-R4-ES-2022-0022;
FF09E21000 FXES1111090FEDR 223]

RIN 1018-BE84

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Rim Rock Crowned Snake and Key Ring-Necked Snake and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list two Florida species, the Key ring-necked snake (*Diadophis punctatus acricus*) and the rim rock crowned snake (*Tantilla oolitica*), and propose to designate critical habitat under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month finding on the petition to list the Key ring-necked snake and the rim rock crowned snake. After a review of the best available scientific and commercial information, we find that listing both species is warranted. Accordingly, we propose to list both species as endangered species under the Act. If we finalize this rule as proposed, it would add the species to the List of Endangered and Threatened Wildlife and extend the Act's protections to both species. We also propose to designate critical habitat for the Key ring-necked snake and the rim rock crowned snake under the Act. In total, approximately 2,604 acres (ac) (1,054 hectares (ha) in Monroe County, Florida, and approximately 5,972 ac (2,418 ha) in Miami-Dade County and Monroe County, Florida, fall within the boundaries of the proposed critical habitat designation for the Key ring-necked snake and the rim rock crowned snake, respectively. We announce the availability of a draft economic analysis of the proposed designation of critical habitat for both species.

DATES: We will accept comments received or postmarked on or before December 13, 2022. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by November 28, 2022.

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

(1) *Electronically:* Go to the Federal eRulemaking Portal: <https://www.regulations.gov>. In the Search box, enter FWS-R4-ES-2022-0022, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on "Comment."

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS-R4-ES-2022-0022, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send comments only by the methods described above. We will post all comments on <https://www.regulations.gov>. This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

Availability of supporting materials: For the proposed critical habitat designation, the coordinates or plot points or both from which the maps are generated are included in the decision file and are available at <https://www.fws.gov/office/florida-ecological-services> and at <https://www.regulations.gov> under Docket No. FWS-R4-ES-2022-0022. Additional supporting information that we developed for this proposed rule will be available on the Service's website, at <https://www.regulations.gov>, or both.

FOR FURTHER INFORMATION CONTACT: Lourdes Mena, Division Manager, Classification and Recovery, Florida Ecological Services Field Office, 7915 Baymeadows Way, Suite 200, Jacksonville, FL 32256-7517; lourdes_mena@fws.gov; telephone 904-731-3134. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely

to become endangered within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the Key ring-necked snake and the rim rock crowned snake both meet the Act's definition of an endangered species; therefore, we are proposing to list them as such and are proposing a designation of critical habitat for both species. Both listing a species as an endangered or threatened species and designating critical habitat can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process.

What this document does. We propose to list both the Key ring-necked snake and the rim rock crowned snake as endangered species under the Act, and we propose to designate critical habitat for both species.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the Key ring-necked snake and the rim rock crowned snake are facing threats due to development (Factor A), fire suppression (Factor A), and effects associated with climate change, particularly sea level rise and saltwater intrusion (Factor E).

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

available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning this proposed rule.

We particularly seek comments concerning:

(1) The species' biology, range, and population trends, including:

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

(b) Genetics and taxonomy;

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

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

(e) Past and ongoing conservation measures for the species, their habitats, or both.

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

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

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

(5) Information on the immediacy and magnitude of threats to the rim rock crowned snake in the upper and lower Florida Keys.

(6) Whether we should consider evaluating populations of the rim rock crowned snake as distinct population segments.

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

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

(b) Such designation of critical habitat would not be beneficial to the species.

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

(8) Specific information on:

(a) The amount and distribution of Key ring-necked snake and rim rock crowned snake habitat;

(b) Any additional areas occurring within the range of the species that should be included in the designation because they (1) are occupied at the time of listing and contain the physical or biological features that are essential to the conservation of the species and that may require special management considerations, or (2) are unoccupied at the time of listing and are essential for the conservation of the species.

(c) For areas not occupied at the time of listing that may be essential for the conservation of the species, we particularly seek comments on whether any additional unoccupied areas should be designated for either species. For the rim rock crowned snake, we ask for information on areas in the Environmentally Endangered Lands (EEL) program in Miami-Dade County that may be essential to the conservation of the rim rock crowned snake. For the Key ring-necked snake, we request information or additional survey data to determine whether we should designate unoccupied critical habitat on Key West for the Key ring-necked snake; and

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

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

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

(11) Information on the extent to which the description of probable economic impacts in the draft economic analysis (DEA) is a reasonable estimate of the likely economic impacts and any additional information regarding

probable economic impacts that we should consider.

(12) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area outweigh the benefits of including that area under section 4(b)(2) of the Act. Specific information we seek includes the effectiveness of the Monroe County habitat conservation plan (HCP) in protecting pine rocklands and rockland hammock habitat and in providing for conservation of the Key ring-necked snake and the rim rock crowned snake.

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

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include. If you request exclusion of a particular area or areas from the final designation, please provide information regarding the existence of a meaningful economic or other relevant impact supporting the benefit of exclusion of that particular area.

Please note that submissions merely stating support for, or opposition to, the action under consideration without providing supporting information, although noted, do not provide substantial information necessary to support a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made solely on the basis of the best scientific and commercial data available, and section 4(b)(2) of the Act directs that the Secretary shall designate critical habitat on the basis of the best scientific data available.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via <https://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot

guarantee that we will be able to do so. We will post all hardcopy submissions on <https://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <https://www.regulations.gov>.

Because we will consider all comments and information we receive during the comment period, our final determinations may differ from this proposal. Based on the new information we receive (and any comments on that new information), we may conclude that either or both species are threatened instead of endangered, or we may conclude that either or both species do not warrant listing as either endangered species or threatened species. For critical habitat, our final designation may not include all areas proposed, may include some additional areas that meet the definition of critical habitat, or may exclude some areas if we find the benefits of exclusion outweigh the benefits of inclusion.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the **Federal Register**. The use of these virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

Both the Key ring-necked snake and the rim rock crowned snake were included as Category 2 candidate species in our December 30, 1982 (47 FR 58454), September 18, 1985 (50 FR 37958), January 6, 1989 (54 FR 554), November 21, 1991 (56 FR 58804), and November 15, 1994 (59 FR 58982), candidate notices of review (CNORs). Category 2 included taxa for which information in our possession indicated that a proposed listing rule was possibly appropriate, but for which sufficient data on biological vulnerability and threats were not available to support a proposed rule.

In the CNOR published on February 28, 1996 (61 FR 7596), we announced a

revised list of plant and animal taxa that were regarded as candidates for possible addition to the Lists of Endangered and Threatened Wildlife and Plants. The revised candidate list included only former Category 1 species. Former Category 2 species were removed from the candidate list in order to reduce confusion about the conservation status of these species and to clarify that we no longer regarded these species as candidates for listing. Since both the Key ring-necked snake and the rim rock crowned snake were Category 2 species, they were no longer recognized as candidate species as of the publication of the February 28, 1996, CNOR.

On July 11, 2012, we received a petition from the Center for Biological Diversity requesting that 53 species of reptiles and amphibians, including the Key ring-necked snake and the rim rock crowned snake, be listed as endangered or threatened and critical habitat be designated under the Act.

On July 1, 2015, we published a 90-day finding (80 FR 37568) that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted for both the Key ring-necked snake and the rim rock crowned snake. This proposed rule constitutes our 12-month petition finding for both species.

Supporting Documents

A species status assessment (SSA) team prepared SSA reports for both the Key ring-necked snake and the rim rock crowned snake (Service 2021a, entire; Service 2021b, entire). The SSA teams were composed of Service biologists, in consultation with other species experts. The SSA reports represent a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species. In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sent the Key ring-necked snake SSA report to five independent peer reviewers for review, including scientists with expertise in wildlife biology, herpetology, and conservation biology. We received two responses. We sent the rim rock crowned snake SSA report to five independent peer reviewers, including scientists with expertise in wildlife biology, herpetology, and conservation biology. We received three responses.

I. Proposed Listing Determination Background

Key Ring-Necked Snake

A thorough review of the taxonomy, life history, and ecology of the Key ring-necked snake (*Diadophis punctatus acricus*) is presented in the SSA report (version 1.0; Service 2021a, pp. 2–5). The Key ring-necked snake is one of 14 distinct subspecies of ring-necked snakes in North America, all of which are subspecies of *D. punctatus*. It is one of the smallest subspecies of the Family Dipsadidae; an adult specimen will average between 6 and 10 inches (in) (15.2 to 25.4 centimeters (cm)). A recent review of phylogenetic data supports the current subspecies classification for the Key ring-necked snake (Hoffman 2019, entire).

This slender snake has a pale grayish-brown head; a grayish-black dorsal surface; and a yellow, orange, or bright red abdomen which fades to orange/red underneath the tail (Florida Fish and Wildlife Conservation Commission (FWC) 2013, p. 1). The pupil is round, and the juvenile color is similar to that of the adult (Ernst and Ernst 2003, p. 92; FWC 2013, p. 1). The characteristic neck ring is indistinct or virtually absent in both juveniles and adults.

Little life-history information is available on the Key ring-necked snake, especially as it relates to microhabitat, feeding, and reproduction. Life-history characteristics are thought to be similar to the southern ring-necked snake. In general, mating of ring-necked snakes can occur in the spring or fall, delayed fertilization is possible, and eggs are laid in June or early July. Females lay 1 to 10 eggs at a time each year (1 clutch/year) in covered, moist locations (Ernst and Ernst 2003, p. 95). Juveniles are thought to hatch in August and September.

Suitable habitat appears to consist of pinelands, pine rocklands, tropical hammock, rockland hammock, limestone outcroppings, and rocky pine scrub areas (McDiarmid 1978, p. 41; Lazell 1989, p. 134; Auth and Scott 1996, p. 33; Enge et al. 2003, pp. 26–28). Most of the observations in the Florida Keys were from pine rocklands or nearby rockland hammocks. This subspecies appears to be restricted to areas near permanent freshwater that often occur as small holes in the oolitic (a sedimentary rock, usually limestone, composed of minute rounded concretions) substrate that underlies pine rocklands and rockland hammock habitat (Lazell 1989, pp. 134, 136). All *Diadophis* apparently require moist microhabitats to balance evaporative

water loss from the body (Myers 1965, p. 4; Clark 1967, pp. 492–494).

Key ring-necked snakes have been documented on seven lower Florida Keys: Key West, Big Pine Key, Little Torch Key, Middle Torch Key, No Name Key, Cudjoe Key, and Stock Island (Auth and Scott 1996, p. 33; FWC 2011, p. 3; 2013, p. 1; Mays and Enge 2016, pp. 11, 13; J. Mays 2020, pers. comm.) (see figure 1, below). A unique characteristic of the Florida Keys is the thin (<3.94 in (10 cm)) layer of sediment

on the islands beneath which lies a bed of limestone, and below that a shallow layer of freshwater referred to as a freshwater lens (U.S. Geological Survey (USGS) 2019a, p. 1). Because the density of freshwater is less than the underlying saltwater, it floats to the top and into the limestone rock formations where it becomes available to the island's biota. The volume of a freshwater lens fluctuates in response to rainfall, evapotranspiration, and human use (local wells).

Systematic recent surveys have not been conducted for the Key ring-necked snake across all of the Florida Keys; therefore, the true spatial distribution of populations throughout the Florida Keys is unclear and our current understanding of the subspecies' distribution is primarily based on historical records. Consequently, this subspecies may occur on Florida Keys other than those reported.

Key Ring-Necked Snake Distribution

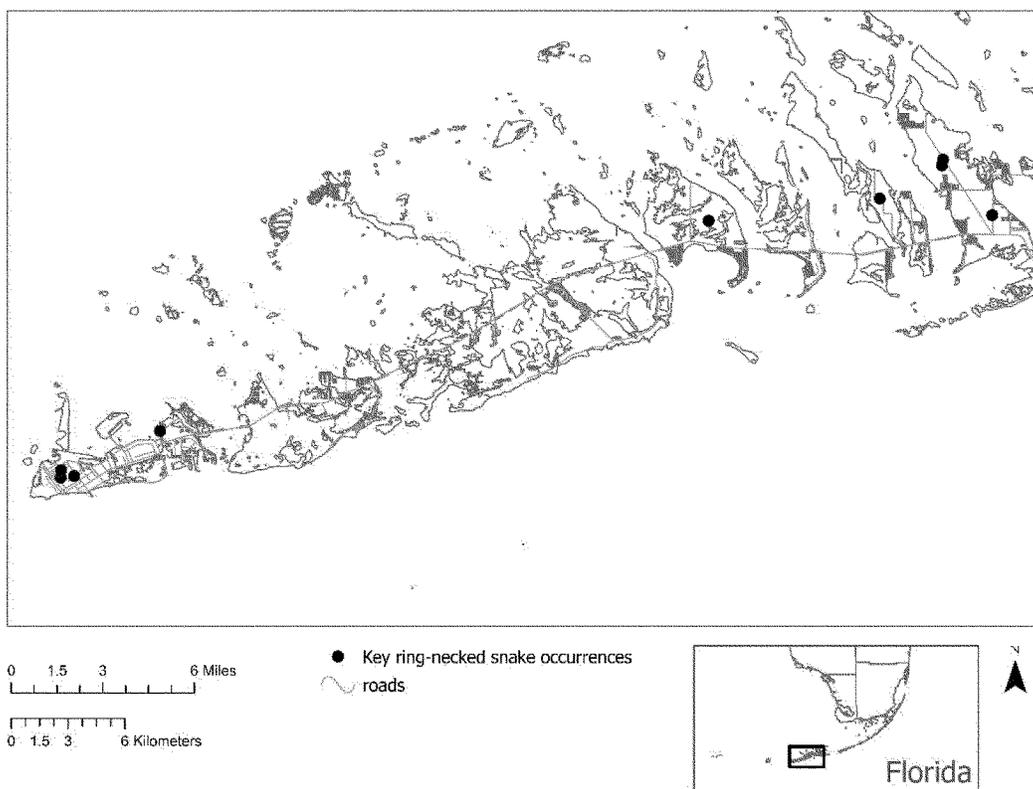


Figure 1.—Distribution and occurrences of the Key ring-necked snake.

Rim Rock Crowned Snake

A thorough review of the taxonomy, life history, and ecology of the rim rock crowned snake (*Tantilla oolitica*) is presented in the SSA report (version 1.0; Service 2021b, pp. 10–20). The rim rock crowned snake is in the family Colubridae, part of the black-headed, crowned, and flat-headed snake genus *Tantilla*, with 76 currently recognized species ranging from the southern United States to northern Argentina (Powell et al. 2016, pp. 395–400). The rim rock crowned snake is most closely related to the southeastern crowned snake (*T. coronata*) taxonomically, although it is located geographically

closer to the Florida crowned snake (*T. relicta*; Ernst and Ernst 2003, pp. 353–355). No genetic analysis has been conducted on the rim rock crowned snake.

Rim rock crowned snakes have a black head (“cap”) that is continuous from snout to neck (“collar”), transitioning to tan or beige on its back, and a pinkish white to cream belly. There is often a pale blotch just behind the eye. Specimens from the Florida Keys may have a pale neckband that is not present in mainland specimens, separating the black cap from the black collar (Porras and Wilson 1979, pp. 218–220). Adults range 7–9 in (18–23 cm) in length. Females reach a greater length than do males, but have shorter

tails (Ernst and Ernst 2003, pp. 353–355). Hatchlings range from 3–3.5 in (7.5–9.0 cm) in length.

The reproduction, longevity, and diet of the rim rock crowned snake are unknown, but if it is similar to the closely related southeastern crowned snake, it probably matures at 2 years old and may live to be at least 5 years old in the wild (Todd et al. 2008, p. 392). There may be three eggs in a clutch, and they may be able to produce two clutches annually (Ernst and Ernst 2003, pp. 353–355). There is no information as to whether eggs or juvenile rim rock crowned snakes require different habitat than adults. Predators are likely larger snake species that inhabit the same areas. It may also be preyed upon by the

slender brown scorpion (*Centruroides gracilis*), which is abundant in rockland habitat (Porrás and Wilson 1979, pp. 218–220).

The rim rock crowned snake is a mostly fossorial (underground) species that inhabits shallow soil over limestone formations, and it can sometimes be found in rotten stumps and under anthropogenic surface detritus, fallen logs, and rocks (Duellman and Schwarz 1958, p. 306; Rochford et al. 2010, p. 99; Yirka et al. 2010, p. 386; FWC 2011, p. 3; Hines 2011, p. 353). These snakes are vulnerable to desiccation, so they usually occupy moist microhabitats (Powell et al. 2016, pp. 395–400). Refugia in pine rocklands and rockland hammock are provided by holes and crevices in the limestone, piles of rock rubble, pockets of organic matter accumulating in solution holes, and shallow depressions in the limestone (Enge et al. 2003, pp. 27–28). Rim rock

crowned snakes likely come to the surface after rains (Porrás and Wilson 1979, pp. 218–220), possibly because of flooding of its underground refugia.

The rim rock crowned snake has been historically found in the lower Florida Keys, in particular Key West and Big Pine Key; the upper Florida Keys; and the southeastern Florida peninsula within Miami-Dade County, in a variety of locations (see figure 2, below). Within this limited range, the rim rock crowned snake is found in pine rocklands and rockland hammock, which consist of a limestone substrate and outcroppings. Pine rocklands habitat is fire-maintained and dominated by pine trees and a diverse understory of grasses and forbs/herbs. In contrast, rockland hammock contains more hardwood shrubs and trees due to less fire influence. There are also occurrence records from human-altered habitats such as roadsides, vacant lots, and

pastures with shrubby growth and slash pines (*Pinus elliottii*) (Duellman and Schwarz 1958, p. 306; Hines 2011, pp. 352–356).

Because of the rim rock crowned snake’s cryptic and fossorial nature, a method to formally census remaining populations throughout its range has not been developed. We do not have any information on the current status of the rim rock crowned snake in these areas and based our understanding of the species’ range on observational records and habitat suitability. Limited dispersal is thought to occur between rim rock crowned snake populations within the Florida Keys because there is no evidence that indicates they readily swim to other islands. Additionally, areas in Miami-Dade County where populations may remain are likely isolated from others due to physical barriers from a dense urban interface.

Rim Rock Crowned Snake Distribution

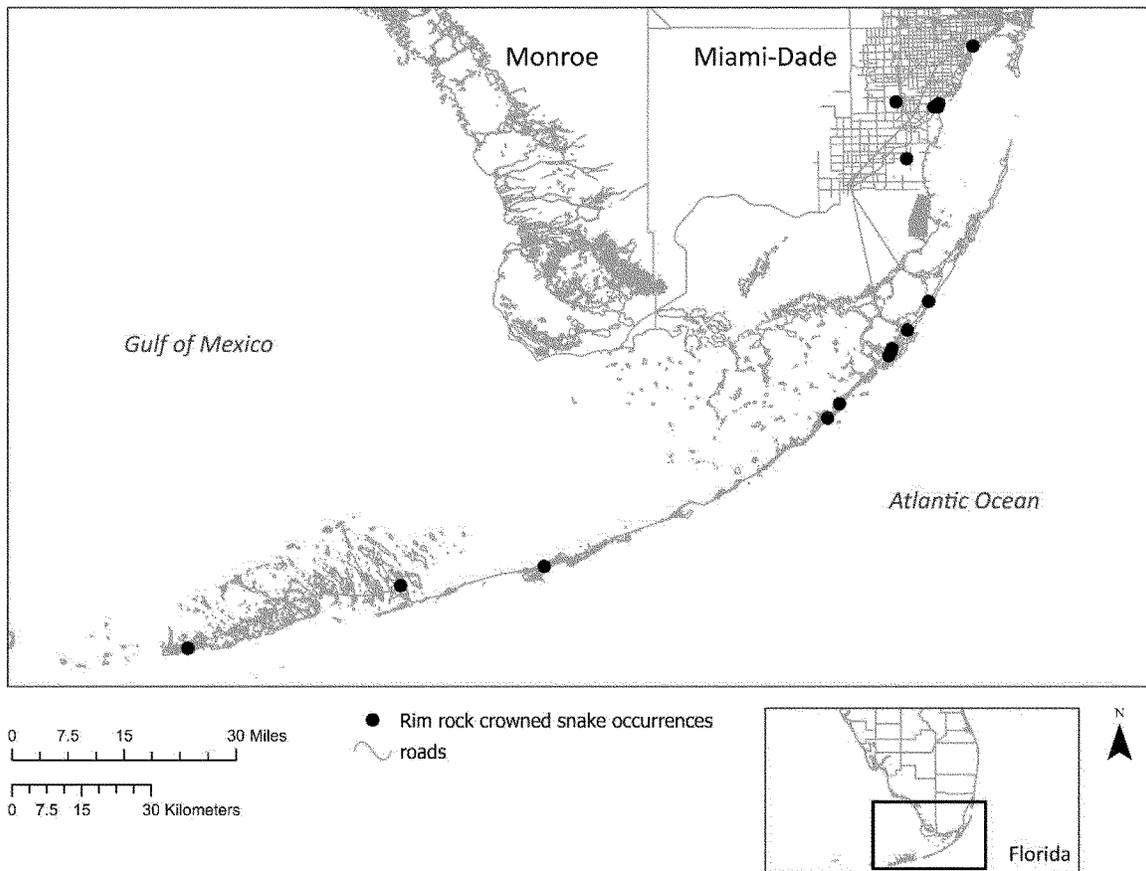


Figure 2.—Distribution and occurrences of the rim rock crowned snake.

Regulatory and Analytical Framework
Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal

Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating

critical habitat for threatened and endangered species. In 2019, jointly with the National Marine Fisheries Service, the Service issued final rules that revised the regulations in 50 CFR parts 17 and 424 regarding how we add, remove, and reclassify threatened and endangered species and the criteria for designating listed species' critical habitat (84 FR 45020 and 84 FR 44752; August 27, 2019). At the same time the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of the Act applies to endangered species (collectively, the 2019 regulations).

However, on July 5, 2022, the U.S. District Court for the Northern District of California vacated the 2019 regulations (*Center for Biological Diversity v. Haaland*, No. 4:19-cv-05206-JST, Doc. 168 (N.D. Cal. July 5, 2022) (*CBD v. Haaland*)), reinstating the regulations that were in effect before the effective date of the 2019 regulations as the law governing species classification and critical habitat decisions. Accordingly, in developing the analysis contained in this proposal, we applied the pre-2019 regulations, which may be reviewed in the 2018 edition of the Code of Federal Regulations at 50 CFR 17.31, 17.71, 424.02, 424.11(d) and (e), and 424.12(a)(1) and (b)(2)). Because of the ongoing litigation regarding the court's vacatur of the 2019 regulations, and the resulting uncertainty surrounding the legal status of the regulations, we also undertook an analysis of whether the proposal would be different if we were to apply the 2019 regulations. That analysis, which we described in a separate memo in the decisional file and posted on <https://www.regulations.gov>, concluded that we would have reached the same proposal if we had applied the 2019 regulations. The differences in the 2009 Solicitor's opinion and 2019 regulations do not change our determination of what constitutes the foreseeable future for the rim rock crowned snake. Under either regulatory scheme we find that critical habitat is prudent for the two snakes. For the Key ring-necked snake, we did not identify any unoccupied areas essential for the conservation of the Key ring-necked snake, which is consistent with 2016 and 2019 regulations. For the rim rock crowned snake, by the year 2040, all suitable habitat in the lower Florida Keys and up to half of suitable habitat in the upper Florida Keys will be affected by sea level rise and saltwater

intrusion. As such, we are also proposing to designate areas not currently occupied by the species, because we determined the unoccupied units are essential for the conservation of the rim rock crowned snake. It is reasonably certain that the unoccupied units will contribute to the conservation of the species by providing additional areas for rim rock crowned snake recovery actions, including population establishment, and the unoccupied units contain all of the physical or biological features that are essential to the conservation of the species and it has the abiotic and biotic features that currently or periodically contain the resources and conditions necessary to support one or more life processes of the rim rock crowned snake.

On September 21, 2022, the U.S. Circuit Court of Appeals for the Ninth Circuit stayed the district court's July 5, 2022, order vacating the 2019 regulations until a pending motion for reconsideration before the district court is resolved (*In re: Cattlemen's Ass'n*, No. 22-70194). The effect of the stay is that the 2019 regulations are currently the governing law. Because a court order requires us to submit this proposal to the **Federal Register** by September 30, 2022, it is not feasible for us to revise the proposal in response to the Ninth Circuit's decision. Instead, we hereby adopt the analysis in the separate memo that applied the 2019 regulations as our primary justification for the proposal. However, due to the continued uncertainty resulting from the ongoing litigation, we also retain the analysis in this preamble that applies the pre-2019 regulations and we conclude that, for the reasons stated in our separate memo analyzing the 2019 regulations, this proposal would have been the same if we had applied the pre-2019 regulations.

The Act defines an "endangered species" as a species that is in danger of extinction throughout all or a significant portion of its range, and a "threatened species" as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

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

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

The Act does not define the term "foreseeable future," which appears in the statutory definition of "threatened species." Because the decision in *CBD v. Haaland* vacated our 2019 regulations with respect to our consideration of foreseeable future, we refer to a 2009 Department of the Interior Solicitor's opinion entitled "The Meaning of 'Foreseeable Future' in Section 3(20) of the Endangered Species Act" (M-37021). The Solicitor's opinion

states that the foreseeable future “must be rooted in the best available data that allow predictions into the future” and extends as far as those predictions are “sufficiently reliable to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.” *Id.* at 13.

It is not always possible or necessary to define the foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

The SSA reports document the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the two species, including assessment of the potential threats to the species. The SSA reports do not represent our decision on whether the species should be proposed for listing as endangered or threatened species under the Act. However, they do provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results and conclusions from the SSA reports, which can be found at Docket No. FWS–R4–ES–2022–0022 on <https://www.regulations.gov> and at <https://www.fws.gov/office/florida-ecological-services>.

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

under changing environmental conditions. Using these principles, we identified the species’ ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

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

Summary of Biological Status and Threats

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

Key Ring-Necked Snake—Population and Subspecies Needs

In this discussion, we outline the resource needs of individuals and populations of the Key ring-necked snake. As part of the assessment, we first identify and describe the four most influential factors representing the individual and population needs for the subspecies: prey, refugia, water, and available suitable habitat. Due to the relative rarity of this subspecies and its secretive nature, many aspects of the life history of this taxon as well as information on population status and trends are poorly known. We rely upon ecologically and genetically similar species to draw inferences when data are lacking.

For prey, the Key ring-necked snake is assumed to be similar to other *Diadophis* species (such as the southern ring-necked snake), which prey upon small insects, snakes, lizards (anoles, geckos), slugs, amphibians (frogs, tadpoles), and earthworms (Ernst and Ernst 2003, p. 96; FWC 2013, p. 2).

Key ring-necked snakes require refugia to escape and hide from predators and to regulate body temperature. Refugia in pine rocklands

and rockland hammock are likely provided by holes and crevices in the limestone, piles of rock rubble, and pockets of organic matter accumulating in solution holes and shallow depressions in the oolitic limestone (Enge et al. 2003, p. 28). Snakes are ectothermic organisms, which require an external heat source to warm their bodies in order to increase body function and productivity. Snakes can also become too hot, leading to desiccation. Therefore, a warm, moist habitat, typically subterranean or shielded from the sun, is likely a preferred refugium to escape from predators and to properly maintain homeostasis (suitable internal temperature and moisture levels).

Water is essential for Key ring-necked snake survival. This subspecies appears to be restricted to areas near permanent freshwater sources that often occur as small holes in the limestone (Lazell 1989, pp. 134, 136). The extensive network of holes, tunnels, and cavities in the limestone substrate most likely assists in creating more permanent water sources. During times of drought, these sources may become scarce and the Key ring-necked snakes may need to seek out other freshwater sources. Consequently, it is important for the Key ring-necked snake to have multiple freshwater sources in case one becomes depleted, contaminated, or unavailable. If all local water sources within a snake’s home range become dry, the snake may need to expend more energy and time in search of new water sources.

The most influential need for population viability is available suitable habitat. Home range is defined as the area a snake traverses for its normal daily activities (Burt 1943, pp. 350–351; Miller 2008, p. 16). The specific acreage associated with the Key ring-necked snake’s home range is unknown; however, an individual was documented traveling 154.2 feet (ft) (47 meters (m)) between coverboards (Lazell 1989, p. 134). Over 400 mark recapture measurements of ring-necked snakes in Kansas indicated a mean travel distance of 262 ft (80m) with a maximum distance of 5,577 ft (1,700 m) (Fitch 1975, p. 25). In another study, a different ring-neck snake subspecies (*Diadophis punctatus*) in northern Michigan was documented to travel between 20 ft (6 m) and 1 mile (1,609 m) (Blanchard et al. 1979, pp. 382, 385). Thus, although ring-necked snakes generally only move within a small home range, they will occasionally disperse over longer distances through suitable habitat.

In regard to population size and distribution of the Key ring-necked snake, there may be either distinct, non-interbreeding populations at each Key, or some occasional but rare level of dispersal from rafting (oceanic dispersal whereby a species travels between islands on a mass or raft of vegetation) between Keys, providing at least a small level of connectivity between individual populations. Because the Key ring-necked snake appears to be isolated to the Keys, the relatively small, archipelago of islands can each support only a small number of individuals (or separate populations).

Due to the cryptic nature of the Key ring-necked snake and limited research, there is virtually no information concerning the population structure and demographics exhibited by this subspecies. Additionally, no information exists on the abundance (number of individuals) or growth rate of these populations. Therefore, we base our assessment of the health and resiliency of these populations on the condition of its habitat as a proxy. That said, continued occurrence of populations over time at known locations suggest some ability to withstand stochastic events on the Keys, historically.

Populations of the Key ring-necked snake are supported by the existence of suitable available habitat (pine rocklands and rockland hammock) across the subspecies' range. Therefore, a strong correlation to habitat availability and Key ring-necked snake populations can be assumed but not at a level of certainty in which the presence of suitable pine rockland or rockland hammock habitat can be used as a surrogate for Key ring-necked snake presence.

Passive dispersal of individual Key ring-necked snakes among the Florida Keys may be occurring on a very limited and random basis. The level to which immigration and emigration via dispersal acts as a factor towards population resiliency and prevention against extinction for this subspecies is unknown. Many of the Florida Keys have yet to be surveyed for Key ring-necked snakes, but if occupied, they could act as "stepping stones" in the random dispersal of individual snakes by way of swimming or rafting. That said, due to the limited size of the Florida Keys, the distance between the Keys, and the fact that swimming has not been documented in Key ring-necked snakes, dispersal is not likely, and, thus, it has a limited influence on population dynamics. Overall, we lack detailed scientific information on the extent of the Key ring-necked snake's

individual populations and population structure. Thus, our understanding of the factors influencing Key ring-necked snake resiliency is limited.

Because systematic recent surveys have not been conducted for the Key ring-necked snake across all of the Florida Keys, the true spatial distribution of populations throughout the Florida Keys is unclear and our current understanding of the subspecies' distribution is primarily based on historical records.

As discussed above, widely distributed populations offer better redundancy than if the populations all occur in close proximity and are vulnerable to similar threats at the same intensity or timing. Because of the Key ring-necked snake's limited geographic range, the species is exposed to threats concurrently and of similar frequency, intensity, and duration across its range. For example, the entire subspecies is vulnerable to the effects of a hurricane passing over the Florida Keys. Additionally, the extent of suitable habitat is naturally limited in the Keys. Consequently, there is little natural redundancy or "backup" for the available habitat, and natural expansion or movement of the subspecies to new areas is not probable. The minimum number of sufficiently resilient populations necessary to sustain the subspecies is unknown. Based on the presence of pine rocklands and rockland hammock habitat (total acreage 7,006 ac (2,835 ha)) in the upper Florida Keys, redundancy could be higher if discrete populations occur across the upper Florida Keys. However, the range of this subspecies appears to be restricted to the lower Florida Keys (Mays 2020, pers. comm.). Given the low likelihood of dispersal between islands, we considered islands in the lower Florida Keys (Key West, Big Pine Key, Little Torch Key, Middle Torch Key, No Name Key, Cudjoe Key, and Stock Island) as separate Key ring-necked snake populations.

As currently indicated, the Key ring-necked snake occupies a small geographic area, making it vulnerable to large-scale threats (for example, storm events/hurricanes, sea level rise) that affect the entire Florida Keys archipelago.

Because of the Key ring-necked snake's narrow geographic and ecological range, there is little variation in habitat types occupied. Also, the Key ring-necked snake does not occur across different ecosystems or have access to different systems in which to adapt. Therefore, the Key ring-necked snake has a narrow breadth of genetic and

environmental diversity within and among populations.

Rim Rock Crowned Snake—Population and Species Needs

As part of the population needs assessment for the rim rock crowned snake, we identified and described the most influential factors (available prey, water, refugia, and suitable habitat) representing the individual and population needs for the species.

The diet of rim rock crowned snakes probably consists of centipedes, insects, and other small invertebrates, similar to the diet of other members of the genus *Tantilla*. Prey eaten by wild and captive *T. coronata* include tenebrionid beetle larvae, earthworms, snails, centipedes, spiders, cutworms, wireworms, and termites and their larvae (Ernst and Ernst 2003, pp. 353–355). We do not know what the prey-related requirements (abundance variety, range, etc.) are to maintain viability.

Water is essential for rim rock crowned snake survival. We have no specific information on the amount of water they require; however, similar species of *Tantilla* tend to survive in warm, moist conditions where water is intermittently available. Small amounts of water can be found in depressions and holes in the limestone substrate, which fill from rain fall or overnight dew. The extensive network of holes, tunnels, and cavities in the limestone substrate may also lead to more permanent water sources. During times of drought, these sources may become scarce, and the snake may need to seek out other fresh water sources. The rim rock crowned snake must have multiple fresh water sources in case one becomes depleted, contaminated, or unavailable. If all local water sources within a snake's home range become dry, the snake may need to expend more energy and time in search of new water sources.

Rim rock crowned snakes require refugia to escape and hide from predators and to regulate body temperature. Refugia in pine rocklands and rockland hammock are provided by holes and crevices in the limestone, piles of rock rubble, and pockets of organic matter accumulating in solution holes and shallow depressions in the limestone (Enge et al. 2003, pp. 27–28). Snakes are ectothermic organisms, which require an external heat source for homeostasis. Snakes can also become too hot, consequently leading to desiccation. Therefore, a warm, moist habitat, typically subterranean or shielded from the sun, is likely a preferred refugium to escape from

predators and to properly maintain homeostasis.

We do not know how much suitable habitat and habitat connectivity is required to maintain viability. An observation of a rim rock crowned snake was recorded (Hines 2011, pp. 352–356) at the Barnacle Historic State Park in Coconut Grove, Miami, Florida, a site that consists of only 6 ac (2 ha) of rockland hammock habitat. We do not know if pine rocklands or rockland hammocks are more suitable for the rim rock crowned snake, as they have been observed in both. Home range is defined as the area a snake traverses for its normal daily activities (Burt 1943, pp. 350–351; Miller 2008, p. 16). The rim rock crowned snake's home range size is unknown.

Rim rock crowned snake populations need abundant individuals within habitat patches of adequate area and quality to maintain survival and reproduction despite disturbance. Therefore, a strong correlation to habitat availability and rim rock crowned snake populations can be assumed, but not at a level of certainty in which the presence of suitable pine rockland or rockland hammock habitat can be used as a surrogate for rim rock crowned snake presence.

Despite these uncertainties, data indicate that the limited and patchy distribution of occupied suitable habitat is negatively affecting population resiliency across the species' range. The majority of suitable rim rock crowned snake habitat in southeastern Miami-Dade County and the Florida Keys has been developed and is highly impacted by human activities. Additionally, the Florida Keys are limited naturally in their land area.

Dispersal of individual snakes among the fragmented suitable habitat in Miami-Dade County could occur, but if it does, it is expected to be on a limited and random basis. The level to which immigration and emigration via dispersal influence population resiliency and extinction risk is unknown. Above-ground dispersal may not be as effective in a highly urbanized environment. The limited size of the suitable habitat and the distance of urban barriers between them suggest that dispersal is unlikely to currently influence the population dynamics. The extent to which rim rock crowned snakes are able to use subterranean cavities of the Miami limestone rock ridge to subvert urban barriers is unknown. Because the underlying rock ridge throughout Miami-Dade County is porous, there is potential for individuals to use it as a means of dispersal to avoid urban barriers. If used, it could allow

more successful random dispersal of individual snakes than above-ground means. However, the extent of influence of dispersal remains largely unknown.

In the Florida Keys, passive dispersal of individual snakes among keys may be occurring on a very limited and random basis. The level to which immigration and emigration via dispersal acts as a factor towards population resiliency and prevention against extinction for this species is unknown. Many of the Florida Keys have yet to be searched, but if occupied, they could act as "stepping stones" in the random dispersal of individual snakes. However, the limited size of the Florida Keys and the distance between them means that dispersal is not likely; thus, it currently has a limited influence on population dynamics.

No recent surveys have been conducted for the rim rock crowned snake; therefore, the true spatial distribution of populations throughout Miami-Dade County and the Florida Keys is unclear, and our current image of the species' distribution is primarily based on historical records. Consequently, this species may very well occur on other areas in Miami-Dade County or the Florida Keys other than those reported, and the importance of the other areas (other than those with identified populations) to the overall species' resiliency is unclear. To date, no genetic analysis has been conducted on the rim rock crowned snake. Consequently, it is unknown whether or not genetically discrete populations exist in the upper or lower Florida Keys or Miami-Dade County where this species has been historically reported. No information exists on the abundance or growth rate of these populations.

Having multiple populations distributed across the landscape offers better redundancy than if the populations all occur in very close proximity and are vulnerable to stressors with the same intensity or timing. For example, the entire species is vulnerable to the effects of a hurricane passing over south Florida. Limited acreage of suitable habitat remains in Miami-Dade County and the Florida Keys; consequently, there is limited opportunity for natural expansion, and movement of the species to new areas is not probable.

Species redundancy for the rim rock crowned snake is provided by individuals being distributed across Miami-Dade County and the upper and lower Florida Keys. However, due to the lack of recent surveys conducted within Miami-Dade County and the Florida Keys, the current rim rock crowned snake's range is unknown. Despite a

level of redundancy provided by the discrete populations and individuals found dispersed across Miami-Dade County and the Florida Keys, the rim rock crowned snake lacks redundancy because of its small endemic range. For some large-scale stressors (storm events and hurricanes) that affect southeastern Florida and the Florida Keys, the species is vulnerable to the timing and intensity of impacts. Overall, the rim rock crowned snake needs multiple, interconnected, healthy populations across its range.

Given the low likelihood of dispersal between islands, we considered islands in the Florida Keys as separate rim rock crowned snake populations. In the upper Keys, north Key Largo, south Key Largo, Plantation Key, Upper Matecombe Key, Lower Matecombe Key, and Marathon (Grassy and Vaca Keys) are considered separate populations. In the lower Keys, Big Pine Key and Key West are considered separate populations. Similarly, due to physical barriers (roads, structures, canals, etc.), we considered the Miami-Dade County locations as distinct populations: Arch Creek Park, Barnacle Historic State Park (BHSP), Bill Sadowski Park, Deering Estate/Ludlum Pineland Area/Chapman Field (DLC), Ned Glenn Pineland, Rockdale and Richmond Pine Rocklands Tract (Zoo Miami).

With regard to representation, the rim rock crowned snake occurs across a narrow geographic and ecological range. Consequently, there is no variation across distance or elevation as there is for other wider-ranging species. The rim rock crowned snake has not been found to occur across different ecosystems, and it is not known if it disperses farther from the limestone rock ridge in southeastern peninsular Florida.

As mentioned previously, no genetic analyses have been conducted on the rim rock crowned snake. Hence, the genetic diversity of this species is unknown, and there is little environmental diversity beyond the two habitat types where the species is found. Similarly, it is unclear if there are morphological or behavioral differences between different rim rock crowned snake populations.

Threats Discussion

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA reports, we have not only analyzed individual effects on the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the

species. To assess the current and future condition of the species, we undertake an iterative analysis that encompasses and incorporates the threats individually and then accumulates and evaluates the effects of all the factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

Following are summary evaluations of six threats analyzed in the SSAs for both the Key ring-necked snake and the rim rock crowned snake: Development (Factor A), fire suppression (Factor A), sea level rise (Factor A), saltwater intrusion (Factor A), shifts in seasonal patterns of rainfall and temperature (Factor A), and storm events (Factor A). We also evaluate existing regulatory mechanisms (Factor D) and ongoing conservation measures.

In the SSAs, we also considered four additional threats: Overutilization due to recreational, educational, and scientific use (Factor B); disease (Factor C); predation (Factor C); and invasive species (Factor E). We concluded that, as indicated by the best available scientific and commercial information, these threats are currently having little to no impact on either the Key ring-necked snake or the rim rock crowned snake and their habitat, and thus their overall effect now and into the future is expected to be minimal. Therefore, we will not present summary analyses of those threats in this document, but we will consider them in our cumulative assessment of impacts to the species. For full descriptions of all threats and how they impact the species, please see both SSA reports (Service 2021a, pp. 9–21; Service 2021b, pp. 25–40).

Key Ring-Necked Snake—Current Threats and Condition

We do not have fine-scale information to determine different levels of threats within individual populations of the Key ring-necked snake. Thus, for this subspecies, we considered threats and population resiliency on the scale of individual islands in that area.

Development

The Key ring-necked snake inhabits a variety of rockland habitat in Monroe County that has been and is still desirable for residential and commercial development (Service 1999, p. 3–174). Over half of the rockland habitat within the Florida Keys has been and continues

to be altered, degraded, or destroyed for residential and commercial development (Hodges and Bradley 2006, pp. 8–9). Urban development and historical land use for agriculture have greatly reduced the extent of pine rocklands in the Florida Keys. Additionally, the quality of some pine rocklands has declined in the Keys because the remaining habitat patches are isolated and confined by surrounding urban development. Although individual snakes show some tolerance of habitat alteration, development and conversion of suitable snake habitat can impact all life stages of the Key ring-necked snake. In addition to direct impacts from loss of soils for nesting and movement and the loss of shelter and shade for adult snakes, ground cover and availability of invertebrate food sources can be reduced. Indirectly, connectivity is further decreased, hindering the finding of mates and the dispersal to new locations by juveniles.

Currently, total habitat area potentially available to Key ring-necked snakes in the lower Florida Keys consists of 1,899 ac (769 ha) of pine rocklands habitat and 3,806 ac (1,540 ha) of rockland hammock habitat (USGS 2019b, p. 4). While the hammock habitats are widespread across many islands in various sizes, pine rocklands remain on only five islands in the lower Florida Keys. One of these islands, Big Pine Key, has 1,480 ac (599 ha) (78 percent) of total pine rocklands area, while other Keys (Little Pine Key, No Name Key, Cudjoe Key, and Sugarloaf Key) contain only small areas of hardwood-invaded pine rocklands. The Florida Keys Carrying Capacity Study conducted in 2003 (Monroe County 2016, entire), concluded that development in the Florida Keys has surpassed the carrying capacity of upland habitats to maintain their ecological integrity, that any further development in the Florida Keys would exacerbate secondary and indirect impacts to remaining habitat, and that any further urbanization in areas dominated by native vegetation would exacerbate habitat loss and fragmentation.

Some habitat protections are currently in place for the Key ring-necked snake. In 2006, Monroe County implemented an HCP for Big Pine Key and No Name Key that incorporates guidelines and recommendations from the 2003 study. The primary goal of the HCP is to maintain and implement a system that directs future growth to meet goals, including to protect natural resources and to encourage a compact pattern of development. Subsequently, future

development on these islands must meet the requirements of the HCP. Furthermore, to fulfill the HCP's mitigation requirement, Monroe County has been actively acquiring parcels of high-quality habitat for listed species and managing them for conservation, including pine rocklands habitat on Big Pine Key and No Name Key. Although the Key ring-necked snake is not a covered species under this HCP, we still expect the habitat protections afforded by the HCP to provide the Key ring-necked snake some protection from development.

Suitable habitat for the Key ring-necked snake is protected within preserves such as the Florida Keys National Wildlife Refuge Complex. The complex spans two Key ring-necked snake populations on No Name Key and Big Pine Key. Overall, 4,711.36 ac (1,906.62 ha) (82.6 percent) of pine rockland and rockland hammock habitats in the lower Keys are protected or under conservation (Florida Natural Areas Inventory (FNAI) 2019). The remaining suitable habitat for the Key ring-necked snake is extremely vulnerable to development. Other than these avenues to protect suitable habitat, the existing regulatory mechanisms and conservation measures do not address the impacts of development.

The effects of development have the potential to reduce individual survival of Key ring-necked snakes and, therefore, may decrease population resiliency. Resiliency may be further reduced due to loss of connectivity between populations, both as dispersal within populations as they become fragmented and dispersal between occurrences on individual islands. Similarly, because the Key ring-necked snake is endemic to only a few lower Florida Key islands, losing even a few populations to the effects of development would result in a substantial reduction in subspecies redundancy. The Monroe County HCP may prevent further development of pine rocklands, although population resiliency would continue to decline as habitats remain degraded due to impacts associated with development.

Fire Suppression

In addition to historical loss of habitat via urban development and agriculture, the quality of pine rocklands has declined due to fire suppression. Further, the quality of some pine rocklands has declined in the Keys because they are isolated and confined by surrounding urban development that restricts the use of prescribed fire, which is the principal management tool. Prescribed fire must be periodically

introduced to sustain the pine rocklands community structure. In the absence of fire, pine rocklands are invaded by many of the species found in hardwood hammocks, they lose their herbaceous flora, and they move along a successional trajectory toward hammock (Service 1999, pp. 3–173). These rockland hammocks are generally present where pine rocklands were not burned for a long period of time, leading to pine rocklands fragmentation. This fragmentation in turn increases the risk of invasion by exotic vegetation along the interface with disturbed or developed areas, further altering, degrading, or destroying suitable habitat for the Key ring-necked snake.

Although Key ring-necked snakes occur in areas where fire has been suppressed, pine rocklands habitat quality is reduced by lack of fire. Thus, fire suppression has the potential to reduce population resiliency through ongoing habitat degradation.

Climate Change

The predominant threat currently affecting the Key ring-necked snake and its habitat is the rapid and intense shifts in climate occurring as a result of increasing greenhouse gas emissions. The entire Florida Keys archipelago is being affected by increases in sea level, saltwater intrusion, increases in tide and tidal flooding, and shifts in seasonal climate pattern. In the SSA report and this proposed rule, we discuss the effects of climate change on the Key ring-necked snake in terms of sea level rise, saltwater intrusion, shifts in seasonal patterns of rainfall and temperature, and storm events (Service 2021a, pp. 23–28).

Sea level rise—The Key ring-necked snake is vulnerable to current and predicted sea level rise across its entire range because it is located only in the Florida Keys, where the effects of increasing sea levels, higher tidal surges, increased coastal and inland flooding, and saltwater intrusion are currently being experienced (Benedict et al. 2018, pp. 9, 13, 31, 7–i; Service 2019, p. 1). The Florida Keys are among the most vulnerable areas to the effects of sea level rise due to their low mean elevation of less than 4 ft (1.2 m) (Service 2019, p. 9). Consequently, the lowest parts of the Florida Keys are highly susceptible to flooding, with parts of the islands farther upland at risk of inundation and saltwater intrusion.

Global sea level has increased by 8 to 9 in (0.20 to 0.23 m) since 1880, with the rate of increase doubling over the past 20 years (Service 2017, p. 5). From 1913 to 2018, the mean high-water line

on Key West rose 0.09 in (0.23 cm) per year (National Oceanic and Atmospheric Administration (NOAA) 2019; Service 2021a, Figure 3). On Vaca Key, sea levels rose 0.14 in (0.36 cm) per year between 1971 (start of data collection) and 2018 (NOAA 2019; Service 2021a, Figure 3).

Recent analysis is now indicating an accelerated rate of sea level rise for the eastern United States above that of the global rate (Park and Sweet 2015, entire; Sweet et al. 2017, pp. 39–41, Sweet et al. 2022, pp. 20–21). The accelerated sea level rise in south Florida is being attributed to shifts in the Florida Current due to added ocean mass brought on by the melting Antarctic and Greenland ice packs and thermal expansion from the warming ocean (Park and Sweet 2015, entire; Rahmstorf et al. 2015, entire; Deconto and Pollard 2016, p. 596; Sweet et al. 2017, pp. vi, 14, 15, 18, Sweet et al. 2022, pp. 22–23). For this reason, adding approximately 15 percent to global mean sea level rise projections is recommended for southeast Florida and the Florida Keys (Park and Sweet 2015, entire; Southeast Florida Regional Climate Change Compact 2012, p. 35). The most recent intermediate sea level scenario for the Florida Keys projects a 1.1–1.2 m (3.6–3.9 ft) increase by 2100 (Sweet et al. 2022, pp. 20–21).

Based on a case study of Big Pine Key in the lower Florida Keys, saltwater intrusion due to sea level rise will begin to negatively affect the root zone of the island's upland vegetation as early as 2030, and increasing saltwater intrusion of groundwater has already been documented (USGS 2019a, pp. 1, 3). As a result, freshwater-dependent flora and fauna, which comprise much of the island's biota, will disappear. By 2040, under intermediate climate scenarios, approximately 88 percent of pine rocklands and 96 percent of rockland hammock habitat in the lower Florida Keys are expected to be impacted by sea level rise (USGS 2019a, entire). By 2040, under extreme climate scenarios, approximately 98 percent of pine rocklands and 99 percent of rockland hammock habitat in the lower Florida Keys are expected to be impacted by sea level rise (USGS 2019a, entire).

The effects of sea level rise could impact the Key ring-necked snake both through loss of individuals during flooding events, and alteration of suitable habitat, causing a loss in population resiliency. If flooding is severe enough, it could extirpate entire populations, leading to a substantial loss of redundancy.

Saltwater intrusion—Higher tidal surges, coastal and inland flooding, and

saltwater intrusion due to increasing sea levels are currently being experienced in the Florida Keys. In the Florida Keys, high tide flooding events primarily affect low-lying coastal areas and exposed pine rockland and rockland hammock habitats. With worsening storms and extreme tidal events, storm surges along the Florida Keys will increase in frequency and severity over time and will impact habitats farther inland. Additionally, with continued increase in sea level rise, high tide/king tide flood frequencies are also expected to rapidly increase, with potentially severe damage to remaining rockland habitat. Pine rocklands species, particularly the dominant canopy species (slash pine), have little ability to tolerate saltwater (USGS 2019b, p. 2).

Salt from ocean water deposited during these high-water events has the potential to remain in place in and under the soil for long periods of time, which negatively impacts vegetative growth. For pine rockland and rockland hammock forests to be sustained in such an ecosystem, nutrient cycling must be extremely efficient (that is, there can be little leaching of nutrients beyond the root zone). In other instances, the effects of more powerful storm surges, rising sea levels, and saltwater intrusion of the islands' freshwater lens have contributed to the conversion and loss of pine forest habitat in the Florida Keys to more halophilic (salt-loving) vegetation such as mangroves and buttonwood (Alexander 1976, pp. 219–222; Ross et al. 1994, pp. 151–154). As discussed above in Background, a unique characteristic of the Florida Keys is the existence of a freshwater lens below each island that is critically important for humans, flora, fauna, and a variety of habitats. Consequently, pine rocklands habitat has already undergone a significant reduction in the Florida Keys due to sea level rise (Ross et al. 1994, p. 154). Currently, some of these areas are occupied by halophytic (salt-tolerant) vegetation such as mangroves and buttonwood (Alexander 1976, pp. 219–222) owing to high tide flooding as a result of rising sea level but also due to saltwater intrusion of the islands' freshwater lens. Over time, further vegetation succession will result in halophytic vegetation dominance on the remaining land and more expansive estuaries across much of the island.

Overall, saltwater intrusion from storm surge and flooding causes the loss of habitat, habitat conversion, and reduction in the capacity of freshwater storage and the freshwater resources relied upon by the Key ring-necked snake to maintain its thermoregulatory requirements. These effects will

continue to result in the loss of suitable habitat, displacement landward to less suitable habitat, and the loss of individual Key ring-necked snakes.

Shifts in seasonal patterns of rainfall and temperature—In the United States, the average temperatures have increased by 1.3 to 1.9 degrees Fahrenheit (°F) (0.77 to 1.1 degrees Celsius (°C)) since recordkeeping began in 1895 (Service 2017, p. 2). The decade from 2000 to 2009 is documented as the warmest on record (Service 2017, p. 2). Since 1991, average temperatures in south Florida have increased 1.5 °F (0.83 °C) or more (Service 2017, p. 2). Continued increases in surface air temperature are expected even if there was an immediate and aggressive reduction in human-produced greenhouse gas emissions (Intergovernmental Panel on Climate Change (IPCC) 2018, pp. 1–11).

We presume that the normal range of temperatures in which activity occurs for the Key ring-necked snake is consistent with that which it has experienced in south Florida. Any continuously higher average number of hot days out of the Key ring-necked snake's optimum range or a permanent shift in average air temperature out of this range has the potential to cause physiological stress. In more extreme cases, once an ectothermic organism is exposed to a temperature outside of its activity temperature range, it is closer to reaching a critical thermal maximum/minimum, in which locomotion becomes uncoordinated and the animal loses its ability to escape conditions that will lead to its death (Zug et al. 2001, pp. 179–188). Key ring-necked snakes may become more vulnerable to situations involving critical thermal maximum when habitat loss and fragmentation limit its ability to move or find suitable microhabitats. Additionally, ambient temperature out of the optimal range will physically influence the environment of nests, which may modify incubation periods, embryo temperatures, egg survival, and hatching times. Physiological stress can also result in a variety of risks including increased predation, reduced reproductive performance, and reduced foraging success.

Precipitation patterns are also changing. Since 1900, annual average precipitation in south Florida has increased by 5 to 10 percent (Service 2017, p. 4). Shifts in seasonal rainfall events are also currently being documented (U.S. Global Change Research Program (USGCRP) 2018, pp. 745–808). The south Florida dry season (November through April) has become wetter, the rainy season (May through October) has become drier, and current

projections show that this trend will continue. This could have detrimental effects on the Key ring-necked snake's seasonal feeding, breeding, and sheltering patterns. Heavy downpours are currently increasing and have especially increased over the last 30 to 50 years. The frequency and intensity of heavy downpours in the Florida Keys have increased by 27 percent since the 1970s (Service 2017, p. 4). Increased inland flooding is predicted during heavy rain events in low-lying areas. With worsening storms, storm surges along coastlines become stronger and push farther inland. Consequently, more powerful storm surges will exacerbate the effects of the increased sea level along the Florida Keys' shorelines.

Currently, the existing regulatory mechanisms and conservation measures do not address the impacts of shifting seasonal patterns of rainfall and temperature. Although changes in seasonal weather patterns in south Florida have been documented (Service 2017, entire), direct impacts on the Key ring-necked snake's habitat have not been observed. However, with increased flooding events associated with climate change and sea level rise, the magnitude of this threat could increase into the future, decreasing population resiliency across the range of the subspecies.

Storm events—There has been a substantial increase in Atlantic hurricane activity by most measures since the early 1980s, the period during which high-quality satellite data first became available. These include measures of intensity, frequency, and duration as well as the number of strongest (Category 4 and 5) storms (Walsh et al. 2014, p. 20). Strong rainstorms, tropical storms, and hurricanes are all-natural parts of a tropical ecosystem. However, although these events are common occurrences, the vulnerability of Key ring-necked snake populations increases as the quantity and quality of their habitat is compromised. This is especially true when the frequency of storm surges increases without adequate time for habitats to recover.

Hurricane activity has been above normal since the Atlantic Multi-Decadal Oscillation (AMO) (the natural variability of the sea surface temperature in the Atlantic Ocean) went into its warm phase around 1992. While the incidence of tropical storms in southeast Florida (including the Keys) is above normal, this frequency is expected to decrease with climate change, but the intensity of the storms is expected to increase by approximately 20 percent (Service 2017, p. 7). This increased intensity results in

larger tidal storm surge and greater destruction than historically documented. Ecosystem resiliency is reduced when impacts by extreme events such as floods or storms occur (Service 2017, p. 7). Saltwater intrusion from storm surge and flooding results in displacement landward to less suitable habitat and the loss of individual Key ring-necked snakes. The limestone substrate, on which snakes likely rely for cover, prey, and nesting, will become flooded more frequently, resulting in a higher frequency and longevity of displacement and stress.

Information on how strong storms impact this subspecies is lacking. However, information does exist on the impacts to habitat from hurricanes and other strong storms that have occurred in the region, providing some insight of the potential damage and loss to the Key ring-necked snake from such storms. These events likely disturb and reduce the quantity and quality of their resources (such as food and cover) and may do so significantly depending upon the severity and proximity of the storm center. This is particularly true when storm surges bring in nutrient-rich sediment that exacerbate soil accretion, salt deposition, and vegetation loss (Dingler et al. 1995, p. 296; Jackson et al. 1995, p. 321).

Additionally, saltwater surges and short-term flooding of upland habitats from strong storms and hurricanes in the Keys have the potential to kill some Key ring-necked snakes and their prey. In 2005, Hurricane Wilma (Category 3) passed just north of the Florida Keys, causing maximum storm tides 5 to 6 ft (1.5 to 1.8 m) above mean sea level in Key West and flooding approximately 60 percent of the city. On Boca Chica and Big Pine Keys, Hurricane Wilma caused a storm surge of 5 to 8 ft (1.5 to 2.4 m) (Kasper 2007, pp. 10–16). In 2017, the combined effect of storm surge and the tide from Hurricane Irma produced maximum inundation levels of 5 to 8 ft (1.5 to 2.4 m) above ground level for portions of the lower Florida Keys from Cudjoe Key eastward to Big Pine Key and Bahia Honda Key, near and to the east of where Irma's center made landfall (Cangialosi et al. 2018, pp. 8–9). A storm surge of 13 ft (4 m) would completely submerge Big Pine Key (Lopez et al. 2004, p. 284).

Currently, the existing regulatory mechanisms and conservation measures do not address the impacts of storm events. The effects of storm events have the potential to reduce individual survival, which could then lead to a reduction in the snake's resiliency and redundancy. While past storms have not resulted in complete inundation of

islands, an increase in the intensity and frequency of storms or a direct hit from a strong hurricane could cause significant reductions in subspecies numbers, further limiting the subspecies' population resiliency and making it even more vulnerable to all other threats.

Summary of Threats

Multiple threats are currently impacting the Key ring-necked snake and its habitat. Although individual populations are no longer likely to be lost to development, ongoing habitat degradation associated with urbanization of both pine rocklands and rockland hammock habitat and fire suppression of pine rocklands are continuing to reduce the availability of the features that the Key ring-necked snake needs for feeding, breeding, and sheltering, thus decreasing population resiliency. Because of the current barriers to dispersal, recolonization is unlikely after a population is extirpated.

Even minor threats that impact just a few individuals in a population need to be considered for their additive effects. For example, threats like predation and invasive species may have low impacts on their own, but combined with impacts of other threats, they are further reducing already low numbers of Key ring-necked snakes. These minor threats were considered cumulatively for their effects to the Key ring-necked snake and, while they may reduce the numbers for some individual populations, were currently found not to impose negative effects at the population level.

Additionally, various threats can originate from a similar cause but produce interdependent effects on the subspecies. For example, greenhouse gas emissions increase the rate and severity of climactic changes, which act in combination as threats on the subspecies. These include sea level rise, seasonal shifts in timing and amounts of precipitation, shifts in temperature patterns, and increased storm intensities that affect the subspecies. Sea level rise reduces available habitat. Because the

average high-water line is now higher than historical levels, areas not typically flooded are now flooded on a more regular basis. The rate of sea level rise in the Florida Keys—specifically at NOAA's KYWF1-8724580 Key West ocean data buoy—had been an average rate of 0.09 inch/year (2.3 mm/year) prior to the previous decade (1990s; NOAA 2016, unpaginated). In the early 2000s, sea level rise began to accelerate exponentially and was estimated at 0.3 inch/year (7.6 mm/year) in 2016 (NOAA 2016, unpaginated).

The severity of threats may also be exacerbated by the Key ring-necked snake's limited distribution and small population size. There are no records that demonstrate that the Key ring-necked snake was ever distributed beyond the lower Florida Keys. Thus, it has, and probably has always had, low natural redundancy. Currently, it is found only on seven lower Florida Key islands. Rarity is not in itself a threat; however, small population size can exacerbate the effects of ongoing threats, making the subspecies more vulnerable to extirpation. As discussed previously, the Key ring-necked snake is a narrow endemic, meaning it has naturally low redundancy to help it buffer against stochastic and catastrophic events.

Currently, the existing regulatory mechanisms and conservation measures do not address the impacts of climate change, sea level rise, and saltwater intrusion. As mentioned above, sea level has increased exponentially since the early 2000s (NOAA 2016, unpaginated). Therefore, the effects of saltwater intrusion have likely degraded existing habitat that supports the Key ring-necked snake, leading to reductions in the features (such as freshwater) that the subspecies needs, and thus reducing population resiliency. The effects of saltwater intrusion are primarily habitat-based, but some individual snakes could also be lost. Signs of saltwater intrusion impacts are currently documented on Big Pine Key, where pine trees have been replaced by salt-tolerant mangrove. The magnitude of this threat has the potential to greatly

increase in the future with the projected severity of sea level rise.

Current Condition of Populations

To characterize the current status of Key ring-necked snake populations, we assigned each stressor as low, moderate, or high impacts to the subspecies based on criteria (see table 1, below); these impacts are occurring at the individual (moderate risk) and population (high risk) levels. The risk of each threat, using the risk scoring criteria in tables 1 and 2, was applied to each population and used to assess the overall population condition (see table 3, below). More specifically, point values were summed for each threat (listed in table 1, below) to determine an overall population condition score (scoring criteria listed in table 2, below) and summarized to convey the current condition of each population of the subspecies (see table 3, below). An area with a high risk of threat as described in tables 1 and 2 will result in low population condition in table 3, and a low risk of threat will result in a high population condition. Each population received similar scores, due to limited information for the subspecies and its small endemic range. Based on the cumulative risk of threats to each population, we then estimated the current condition of each population and the likelihood of persistence of each population (Table 2). We defined populations in the SSA report and this proposed rule by the boundary of each island, as we lack information on possible population divisions within each island or about distribution between islands.

Overall, all populations of the Key ring-necked snake are in low condition and reduced from historical condition, with ongoing effects from habitat degradation, fire suppression, sea level rise, and saltwater intrusion. Though populations are currently extant on all known islands throughout the species' range, the species is only found on seven islands in a similar ecological setting. Thus, species representation and redundancy are low.

TABLE 1—CURRENT CONDITIONS BASED ON RISK OF THREATS

Threat	Low risk (1)	Moderate risk (2)	High risk (3)
Development	Development occurrence protected by land management plan.	The level of development would affect suitable habitat and displace some individual snakes, but not at an extent to affect snake populations.	A significant amount of suitable habitat would be lost due to development such that snake populations would be impacted.
Disease	No impacts	Some individual snakes would exhibit signs of disease, but impacts would not be widespread enough in the snake population to affect resiliency.	Disease would be prevalent in populations across the range of the subspecies, decreasing population resiliency.

TABLE 1—CURRENT CONDITIONS BASED ON RISK OF THREATS—Continued

Threat	Low risk (1)	Moderate risk (2)	High risk (3)
Fire suppression in pine rocklands.	Ongoing, regular fire maintenance.	The level of fire suppression would affect some suitable habitat and displace some individual snakes, but not at an extent to affect population resiliency.	A significant amount of suitable habitat would be lost due to fire suppression such that snake population resiliency would be impacted.
Predation	No impacts	Some individual snakes would be predated, but impacts would not be widespread throughout snake populations.	Predation would be prevalent in populations across the range of the subspecies, decreasing population resiliency.
Invasive species	No impacts	Invasive plants would not outcompete native plants to the extent that a significant amount of suitable snake habitat is altered. Non-native fauna would outcompete some individual snakes for food, or prey on some snakes, but the effects would not be widespread in the snake population.	Invasive plants would outcompete native plants altering habitat so it is no longer suitable for the snake. Nonnative fauna may outcompete snakes for food, or prey on snakes such that populations are impacted.
Sea level rise	No impacts	Individual snakes will be affected by increasing sea levels, higher tidal surges, and increased coastal and inland flooding.	The severity of increasing sea levels, higher tidal surges, and increased coastal and inland flooding would impact snake populations and possibly extirpate areas.
Saltwater intrusion	No impacts	Some individual snakes will be displaced by the frequency and severity of saltwater intrusion and its impact to suitable snake habitat.	The frequency and severity of saltwater intrusion and its impact to suitable snake habitat would impact snake populations, decreasing population resiliency.
Shifts in seasonal patterns of rainfall and temperature.	No impacts	Individual snakes would be affected by the frequency and intensity in these seasonal patterns changes, but not to the extent that population resiliency would be affected.	The frequency and intensity in these seasonal patterns changes would impact snake populations.
Storm events	No impacts	The intensity, frequency, and duration of storm events would be at a level in which the quantity and quality of individual snake needs are compromised, and some snakes would be displaced landward to less suitable habitat.	The intensity, frequency, and duration of storm events would be at a significant level such that the quantity and quality of snake resources were reduced, and snake populations would be displaced.

TABLE 2—RISK AND OVERALL POPULATION CONDITION SCORING CRITERIA FOR CURRENT AND FUTURE CONDITIONS OF POPULATIONS

Overall population condition	Risk of threat	Population persistence over 60 years	Probability of persistence (%)
High (9–13 points)	1	Very Likely	91–100
Moderate (14–18 points)	2	Likely	51–90
Low (19–24 points)	3	Unlikely to likely as not	0–50

Point values for each threat (see table 1, above) were summed within an analysis area to determine the overall population condition score.

TABLE 3—THE RISK OF THREATS AND THEIR EFFECT ON THE POPULATION CONDITION OF THE KEY RING-NECKED SNAKE

Area	Development	Fire suppression of pine rocklands	Disease	Predation	Invasive species	Sea level rise	Saltwater intrusion	Shifts in seasonal patterns of rainfall and temperature	Storms	Population condition
Big Pine Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Cudjoe Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Key West	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Little Torch Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Middle Torch Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
No Name Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Stock Island	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.

The subspecies was analyzed by island. Note that the first nine columns rank the condition of threats, while the final column ranks population condition. Thus, multiple columns of high threat risk result in low population condition.

Rim Rock Crowned Snake—Current Threats and Condition

We do not have fine-scale information to determine different levels of threats within individual populations of the rim rock crowned snake. Thus, for this species, we considered threats at a larger scale in three general areas:

eastern Miami-Dade County, the upper Florida Keys, and the lower Florida Keys, and on individual islands where data were available. We also considered population resiliency in isolated habitat patches in the Miami-Dade area and on individual islands in the Florida Keys. We considered North Key Largo and

Key Largo as two separate populations due to the distances between occurrences and due to several barriers to movement.

Development

The rim rock crowned snake inhabits upland rockland habitat (pine rocklands and rockland hammock) that is also desirable for residential and commercial development (Service 1999, p. 3–174). Urban development and agriculture have greatly reduced the extent of pine rocklands and rockland hammock habitat in eastern Miami-Dade County and the Florida Keys. Additionally, the quality of some pine rocklands has declined in the Keys because the remaining habitat patches are isolated and confined by surrounding urban development. Individual rim rock crowned snakes are occasionally documented in roadsides, vacant lots, trash piles, and pastures with shrubby growth and slash pines (FWC 2011, pp. 2–3; Hines 2011, pp. 352–356), but it is unknown whether these individuals are tolerating urban conditions or have been displaced. However, development and conversion of rockland habitat can impact all life stages of the rim rock crowned snake due to direct habitat loss and mortality. In addition to direct impacts from loss of soils for nesting and movement, ground cover and availability of invertebrate food sources can be reduced. Loss of habitat reduces shelter and shade for adults and decreases connectivity, thereby hindering dispersal by juveniles and finding of mates.

Extensive land clearing for human population growth, development, and agriculture in Miami-Dade and Monroe Counties has altered, degraded, or destroyed thousands of acres of suitable habitat for rim rock crowned snakes. Throughout south Florida, development and agriculture have reduced pine rocklands habitat to approximately 3 percent of historical levels. Currently, the total habitat area available in Miami-Dade County is approximately 2,275 ac (921 ha) of pine rocklands habitat and 609 ac (247 ha) of rockland hammock habitat, not including Everglades National Park (where the rim rock crowned snake has never been found), or less than 10 percent of the historical extent of this habitat. In the lower Florida Keys, the total area of pine rocklands habitat is approximately 1,899 ac (769 ha), and the total area of rockland hammock habitat is approximately 3,806 ac (1,540 ha), or less than half of the historical extent of this habitat. While the hammock habitats are widespread across many islands in various sizes, pine rocklands

remain on only five islands in the lower Florida Keys and none of the upper Florida Keys. The total area covered by rockland hammock in the upper Florida Keys is 7,006 ac (2,835 ha).

Some habitat protections are currently in place for the rim rock crowned snake. Starting in 1990, Miami-Dade County's EEL program began acquiring pine rocklands and other natural areas to preserve and protect from development. Once acquired, the EEL program funds land management to maintain and protect the habitat. Since the program's inception, more than 1,500 ac (607 ha) of pine rocklands have become EEL preserves (Miami-Dade County 2019). Rim rock crowned snakes have been found at four EEL preserves.

Additionally, Monroe County implemented an HCP for Big Pine and No Name Keys starting in 2006. In 2007, a rim rock crowned snake was observed on Big Pine Key (Hines 2011, p. 353). Subsequently, development on these islands has to meet the requirements of the HCP in regard to future development. In order to fulfill the HCP's mitigation requirement, Monroe County has been actively acquiring parcels of high-quality habitat for listed species and managing them for conservation, including pine rocklands habitat on Big Pine and No Name Keys. Although the rim rock crowned snake is not a covered species under this HCP, we still expect the habitat protections afforded by the HCP to provide the rim rock crowned snake some protection from development, as the areas where the snakes occur will be avoided due to protections for species that are covered by the HCP.

Suitable habitat for the rim rock crowned snake is protected within Federal preserves such as Everglades National Park, Crocodile Lake National Wildlife Refuge, and the National Key Deer Refuge; however, the rim rock crowned snake has only been documented in the National Key Deer Wildlife Refuge and Crocodile Lake National Wildlife Refuge. Most of the other records are located on State, local government, or privately owned lands, which are all small fragments of suitable habitat. Extensive pine rocklands habitat is present in the Long Pine Key area of Everglades National Park. However, despite extensive survey efforts (Dalrymple et al. 1991, entire), no evidence of the rim rock crowned snake has been found in Everglades National Park.

Over 90 percent of suitable rockland habitat for rim rock crowned snakes has been lost due to human development in south Florida including the Florida Keys, meaning some populations (and

thus redundancy) have already been lost. For example, rim rock crowned snakes were previously detected at sites in Miami near intersections of SW 27 Avenue/SW 24 Street, Old Cutler Road/Red Road, and US 1/SW 154 Ave. There are also numerous historical records detected at locations in the greater Miami metropolitan area (Kendall, Coral Gables, Ludlum, Homestead Air Base). However, no rim rock crowned snakes have been found at these locations since the 1980s. Furthermore, extensive urbanization surrounding these remaining habitats reduces survival, via rendering the species less able to withstand environmental and demographic stochasticity and disturbances (that is, reduced resiliency). Resiliency may be further reduced due to loss of connectivity between populations. Because the rim rock crowned snake is endemic to only the southeastern part of the Florida peninsula and the Florida Keys, losing even a few populations to the effects of development would result in a substantial reduction in species redundancy. However, most of the remaining habitat patches are protected, meaning few additional populations are likely to be extirpated due to development, although habitat degradation could result in continued decreases in population resiliency as the species' needs, such as prey and cover, are lost.

Fire Suppression

As discussed above under "Development," urban development and historical conversion to agriculture has greatly reduced the extent of pine rocklands in southeastern Florida and the Florida Keys. The quality of remaining pine rocklands has declined because those areas are isolated by surrounding urban development that restricts the use of prescribed fire, which is the principal management tool for pine rocklands. Prescribed fire must be periodically introduced to sustain the pine rocklands community structure. In the absence of fire, pine rocklands are invaded by many of the species found in hardwood hammocks. They lose their herbaceous flora and move along a successional trajectory toward hammock (Service 1999, p. 3–173). These rockland hammocks are generally present where pine rocklands were not burned for a long period of time, creating more pine rocklands fragmentation. This fragmentation of pine rocklands in the South Florida and the Florida Keys increases the risk of invasion by exotic vegetation along the interface with disturbed or developed areas, further altering, degrading, or destroying

suitable habitat for the rim rock crowned snake.

Although rim rock crowned snakes can still persist in areas where fire has been suppressed, habitat quality is reduced by lack of fire. Thus, the effects of fire suppression in pine rocklands have the potential to reduce population resiliency through ongoing habitat degradation that impacts the rim rock crowned snake and its habitat.

Climate Change

The predominant threat currently affecting the rim rock crowned snake and its habitat are the rapid and intense shifts in climate occurring as a result of increasing greenhouse gas emissions. South Florida and the Florida Keys are being affected by increases in sea level, saltwater intrusion, increases in tide and tidal flooding, and shifts in seasonal climate pattern. In the SSA report and this proposed rule, we discuss the effects of climate change on the rim rock crowned snake in terms of sea level rise, saltwater intrusion, shifts in seasonal patterns of rainfall and temperature, and storm events.

Sea level rise—The rim rock crowned snake is vulnerable to current and predicted sea level rise and saltwater intrusion across its entire range because it is located only in south Florida. South Florida, including the Florida Keys, are among the most vulnerable areas to the effects of sea level rise due to their low mean elevation of less than 1.2 m (4 ft) (Service 2019, p. 9). Consequently, south Florida is highly susceptible to flooding, with lands farther upland at risk of inundation and saltwater intrusion. The effects of increasing sea levels, higher tidal surges, coastal and inland flooding, and saltwater intrusion are currently being experienced in south Florida and the Florida Keys (Benedict et al. 2018, pp. 9, 13, 31, 7–i; Service 2019, p. 1).

As discussed above in *Key Ring-necked Snake—Current Condition* under “Climate Change,” *Sea level rise*, the Florida Keys are particularly vulnerable to sea level rise, and the Florida Keys and South Florida are experiencing higher levels of sea level rise than other parts of the globe, as well as higher tidal surges, increased coastal and inland flooding, and saltwater intrusion (Benedict et al. 2018, pp. 9, 13, 31, 7–i; Service 2019, p. 1).

Consequently, pine rocklands habitat has already undergone a significant reduction in the Florida Keys due to sea level rise (Ross et al. 1994, p. 154). As mentioned previously, some of these areas are currently occupied by halophytic (salt-tolerant) vegetation such as mangroves and buttonwood

(Alexander 1976, pp. 219–222) owing to high tide flooding as a result of rising sea level but also due to saltwater intrusion of the islands’ freshwater lens.

The effects of sea level rise could impact the rim rock crowned snake by loss of individuals during flooding events, causing a loss in population resiliency. If flooding is severe enough, it could extirpate entire populations, particularly in the lower Florida Keys, leading to a substantial loss of redundancy of the species.

Saltwater intrusion—Higher tidal surges, coastal and inland flooding, and saltwater intrusion due to increasing sea levels are currently being experienced in south Florida and the Florida Keys. With worsening storms and extreme tidal events, storm surges along south Florida and the Keys will increase in frequency and severity over time and will impact habitats farther inland. As discussed above in *Key Ring-necked Snake—Current Condition* under “Climate Change,” *Saltwater intrusion*, this threat will result in habitat degradation and the loss of individual snakes. For the rim rock crowned snake, these effects have been primarily felt in populations in the Florida Keys, although some coastal populations in eastern Miami-Dade County may also experience some small amounts of saltwater intrusion.

Currently, the existing regulatory mechanisms and conservation measures do not address the impacts of saltwater intrusion. As mentioned above, sea level has increased exponentially since the early 2000s (NOAA 2016, unpaginated). The effects of saltwater intrusion have likely degraded existing habitat that supports the rim rock crowned snake in the Keys, leading to reductions in the features (such as freshwater) that the species needs, and thus reducing population resiliency. The effects of saltwater intrusion are primarily habitat-based, but some individual snakes could also be lost. Signs of saltwater intrusion impacts have been documented on Big Pine Key, where pine trees have been replaced by salt-tolerant mangrove. The magnitude of this threat has the potential to greatly increase with the projected future severity of sea level rise.

Shifts in seasonal patterns of rainfall and temperature—As discussed above in *Key Ring-necked Snake—Current Condition* under “Climate Change,” *Shifts in seasonal patterns of rainfall and temperature*, rising greenhouse gases are resulting in increasing temperatures and shifting precipitation patterns. Like the Key ring-necked snake, the rim rock crowned snake is a fossorial ectotherm and, therefore,

dependent on gaining heat from its microhabitat or by coming into contact with the undersides of warm surfaces (for example, rocks) that are exposed to direct sunlight. As with the Key ring-necked snake, increased temperatures could result in a permanent shift in average air temperature out of rim rock crowned snake’s optimal range, causing physiological stress. Physiological stress can manifest into a variety of risks including predation, reduced performance, and reduced foraging success. Altered precipitation patterns could have detrimental effects on the seasonal feeding, breeding, and sheltering patterns for the rim rock crowned snake. Increased inland flooding is predicted during heavy rain events in low-lying areas. With worsening storms, storm surges along coastlines can become stronger and push farther inland. Consequently, more powerful storm surges will exacerbate the effects of the increased sea level along south Florida and Florida Keys’ shorelines and could have impacts on rockland habitat.

Currently, the existing regulatory mechanisms and conservation measures do not address the impacts of shifting seasonal patterns of rainfall and temperature. Although changes in seasonal weather patterns in south Florida have been documented (Service 2017, entire), direct impacts on the rim rock crowned snake or its habitat have not been observed. However, with increased flooding events associated with sea level rise from climate change, the magnitude of this threat could increase into the future, particularly for populations in the Florida Keys and coastal areas of Miami-Dade County, decreasing population resiliency.

Storm events—Changing patterns in hurricane activity are having similar effects to the rim rock crowned snake as to the Key ring-necked snake, as discussed above in *Key Ring-necked Snake—Current Condition* under “Climate Change,” *Storm events*. The health of the rim rock crowned snake becomes vulnerable when the quantity and quality of their resources (for example, food, cover/substrate) are compromised. This can particularly happen in the case of storm surges and with an increase in the number of incidences (for example, being impacted repeatedly without time to recover). Saltwater intrusion from storm surge and flooding results in displacement landward to less suitable habitat and the loss of individual rim rock crowned snakes. The limestone substrate, which rim rock crowned snakes likely rely on for cover, prey, and nesting, will become more frequently flooded,

creating a higher frequency and longevity of displacement and stress. Storm events likely disturb and reduce the quantity and quality of the resources for the rim rock crowned snake.

Hurricane Andrew (1992) hit southern Miami-Dade County with sustained winds in excess of 145 miles per hour (233 kilometers per hour), impacting 99 percent of pine rocklands. Within 1 year of the event, many adult trees were dead, outbreaks of *Ips* beetles (including *I. calligraphis*, *I. avulsus*, and *I. grandicollis*) had been reported, and two species of weevil (*Hylobius pales*, *Pachylobius picivorus*) had attacked juvenile trees. The outbreak has been attributed to the combination of wind damage and drought following a very dry spring, making the trees more susceptible to infestation. In a fall 1993 follow-up survey of Miami-Dade County pine rocklands, only 2 of 18 sites had living mature pines. The loss of the pines affected fire fuel production and could allow invasive species to further impact pine rocklands (Service 1999, p. 3–176).

Currently, the existing regulatory mechanisms and conservation measures do not influence or address the storm events. The effects of storm events have the potential to reduce individual survival, which could then lead to a reduction in the snake’s resiliency and redundancy. While past storms have not resulted in complete inundation of islands, an increase in the intensity and frequency of storms has the potential to produce complete inundation of suitable snake habitat, and therefore possible extirpation of the species.

Summary of Threats

Multiple threats are currently impacting the rim rock crowned snake at the individual and population level and its habitat. The risk of each threat was based on the scoring criteria in tables 1 and 2, above, as applied to each population, and used to assess the

overall population condition (see table 4, below).

Although individual populations are less likely to be lost to development, ongoing habitat degradation associated with urbanization and fire suppression in pine rocklands are continuing to reduce the availability of the features that the rim rock crowned snake needs for feeding, breeding, and sheltering, thus decreasing population resiliency. Additionally, all effects associated with climate change are interrelated, with shifts in the magnitude of severe storms contributing to increased flooding events that have the potential to extirpate entire populations of the rim rock crowned snake. Although a severe hurricane is unlikely to flood all populations at once, if a hurricane were to extirpate most populations, it would leave the remainder of the species significantly more vulnerable to other threats. Because of the current barriers to dispersal for populations in Miami-Dade County, recolonization is unlikely after a population is extirpated. Some populations, for example on Big Pine Key, may be able to recolonize extirpated sites because there are fewer barriers to dispersal due to less urbanization.

Even minor threats that impact just a few individuals in a population need to be considered for their additive effects. For example, threats like predation and invasive species may have low impacts on their own, but combined with impacts of other threats, they are further reducing already low numbers of rim rock crowned snakes. These minor threats were considered cumulatively for their effects to the rim rock crowned snake and, while they may reduce the numbers for some individual populations, were currently found not to impose negative effects at the population level.

Additionally, various threats can originate from a similar cause but produce a set of interdependent effects on the species. For example, greenhouse

gas emissions increase the rate and severity of climactic changes, which act in combination as threats on the species. These include sea level rise, seasonal shifts in timing and amounts of precipitation, shifts in temperature patterns, and increased storm intensities that affect the species. Sea level rise further reduces available habitat. Because the average high-water line is now higher than historical levels, areas not typically flooded are now flooded on a more regular basis.

The severity of threats may also be exacerbated by the rim rock crowned snake’s limited distribution and small population size. The rim rock crowned snake is not known to have occurred beyond the southeastern peninsula of Florida or the Florida Keys. Thus, it has, and probably has always had, low representation and redundancy. Currently, it is thought to exist in seven small and fragmented parcels in eastern Miami-Dade County, six islands in the upper Florida Keys, and two lower Florida Key islands. Rarity is not in itself a threat; however, small population size can exacerbate the effects of ongoing threats, making the species more vulnerable to threats.

Current Condition of Populations

As with the Key ring-necked snake, to characterize the current status of the rim rock crowned snake, we assigned each stressor as low, moderate, or high impacts to the subspecies (table 1, table 2). We summarize the current condition of rim rock crowned snake populations in table 4. Overall, the current condition of populations in the Miami-Dade area is moderate, and the condition of populations in the Florida Keys is low.

Given the species’ limited distribution and limited ecological setting, representation is currently low. However, the species has moderate redundancy, as it has multiple populations distributed throughout the Miami-Dade area and the Upper and Lower Florida Keys.

TABLE 4—THE THREAT RISK AND THE EFFECT ON THE CURRENT CONDITION OF RIM ROCK CROWNED SNAKE POPULATIONS

Population	Development	Fire suppression in pine rocklands	Disease	Predation	Invasive species	Sea level rise	Saltwater intrusion	Shifts in seasonal patterns of rainfall and temperature	Storms	Population condition
MIAMI-DADE COUNTY										
Arch Creek	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
BHSP	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
Bill Sadowski	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
DLC	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
Ned Glenn	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
Rockdale	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.

TABLE 4—THE THREAT RISK AND THE EFFECT ON THE CURRENT CONDITION OF RIM ROCK CROWNED SNAKE POPULATIONS—Continued

Population	Development	Fire suppression in pine rocklands	Disease	Predation	Invasive species	Sea level rise	Saltwater intrusion	Shifts in seasonal patterns of rainfall and temperature	Storms	Population condition
MIAMI-DADE COUNTY										
Richmond Pine Rocklands.	Moderate	High	Low	Low	Low	Moderate ..	Moderate ..	Moderate ..	Moderate ..	Moderate.
UPPER FLORIDA KEYS										
North Key Largo	Moderate	High	Low	Low	Low	High	High	High	High	Low.
South Key Largo	Moderate	High	Low	Low	Low	High	High	High	High	Low.
Plantation Key	Moderate	High	Low	Low	Low	High	High	High	High	Low.
Upper Matecombe Key	Moderate	High	Low	Low	Low	High	High	High	High	Low.
Lower Matecombe Key	Moderate	High	Low	Low	Low	High	High	High	High	Low.
Marathon	Moderate	High	Low	Low	Low	High	High	High	High	Low.
LOWER FLORIDA KEYS										
Big Pine Key	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.
Key West	Moderate	Moderate	Low	Low	Low	High	High	High	High	Low.

Note that the first nine columns rank the condition of threats, while the final column ranks population condition. Thus, multiple columns of high threat risk result in low population condition.

Future Threats and Condition

To examine the potential future condition of the snakes, four plausible future scenarios were developed. The scenarios focused on a range of conditions based on climate change scenarios and projections for land development. The range of what is likely to happen in each scenario is described based on current condition and how resiliency, representation, and redundancy would be expected to change. The levels of certainty or uncertainty are addressed in each scenario. Given that there is uncertainty as to exact future trends of many threats, these future scenarios are meant to explore the range of plausible future scenarios and examine the snakes' response across the range of these conditions.

We define viability as the ability to sustain populations over time. For this to occur, a species must have a sufficient number and distribution of healthy populations to withstand changes in its biological (predators, disease) and physical (habitat loss, climate change) environment, environmental stochasticity (flooding, storm surge), and catastrophic events (hurricanes). In considering the future scenarios for the Key ring-necked snake and the rim rock crowned snake, we analyzed expected changes in development up through 2070 based on the timeframe forecast in the urban

planning documents (Zwick and Carr 2006, entire), shifts in seasonal patterns of rainfall and temperature (up through 2100), and climate change (sea level rise and saltwater intrusion) from 2030 to 2100. That said, we focused on changes that are expected in the next 20 to 60 years (i.e., by 2040–2080) because virtually no habitat is forecasted to be present in the lower Florida Keys by 2080. The habitat in Miami-Dade County is forecasted to continue on the same trend up to 2100 as predicted from 2040–2080 (USGS 2019b, d, entire). We do not have any information on future trends of other threats (disease, predation, invasive species, and collection).

We chose four plausible scenarios to examine the potential impacts to Key ring-necked snake and rim rock crowned snake populations from development, fire suppression of pine rocklands habitat, climate impacts (sea level rise and saltwater intrusion), storm events, and shifts in seasonal patterns of rainfall and temperature. We determined the population condition (using criteria described above in table 1) given our future projections of threats.

In order to understand the impacts of sea level rise and associated impacts on the Key ring-necked snake and the rim rock crowned snake, we contracted a study with the USGS to measure the potential future impacts on pine rocklands and rockland hammock habitat in the range of the Key ring-necked snake and the rim rock crowned snake (USGS 2019, entire). The study calculated the impacts of root zone salinization, regional sea level rise, and

high tide effects on suitable habitat in Miami-Dade County and the Florida Keys in 10-year intervals between 2030 and 2100. In this proposed rule, we present a summary of those results. Detailed descriptions of the study and its results are available in the SSA reports for the Key ring-necked snake and the rim rock crowned snake (Service 2021a, pp. 25–27; Service 2021b, pp. 43–47).

Key Ring-Necked Snake—Future Threats and Condition

Because we determined that the current condition of the Key ring-necked snake is consistent with an endangered species (see Determination of Species Status, below), we are not presenting the results of the future scenarios in this rule. For more information on the future condition, future threats, and future scenarios for the Key ring-necked snake, please see the SSA report (Service 2021a, pp. 21–33).

Rim Rock Crowned Snake—Future Threats and Condition

Development—Future Impacts

Future development is very likely to continue across the range of the rim rock crowned snake. Suitable habitat that is projected to be lost in all of these scenarios is privately owned and not currently under conservation.

Miami-Dade and Monroe Counties are not anticipated to undergo dramatic land use changes by 2070, because most land in these counties is already allocated to development, agriculture, or conservation (Carr and Zwick 2016, pp. 20–22). Of remaining pine rocklands

and rockland hammock habitat, 76 percent in eastern Miami-Dade County, 79 percent in the upper Florida Keys, and 83 percent in the lower Florida Keys are protected or conserved (FNAI 2019). However, because such limited habitat area remains, any remaining suitable unprotected habitat for the rim rock crowned snake is extremely vulnerable to development if left unprotected, and even the loss of one population (particularly in the Miami-Dade area) could have a significant effect on the species.

Of the suitable habitat for rim rock crowned snake remaining in Miami-Dade County, between 19 and 21 percent is expected to be lost to development by 2070 (Carr and Zwick 2016, pp. 20–22). Although the expected population growth in Monroe County in the Florida Keys is relatively modest, all vacant private lands not protected for conservation purposes are projected to be developed, including lands currently inaccessible for development, such as islands not attached to the Overseas Highway (U.S. 1) (Zwick and Carr 2006, pp. 14–15). This development will have the potential to further reduce the amount of suitable habitat for the rim rock crowned snake.

Fire Suppression—Future Impacts

Fire suppression has had considerable negative impacts on pine rocklands communities. The condition of some extant pine rocklands has declined and become degraded because of inadequate

management or because they are isolated and confined by surrounding development that restricts the use of prescribed fire, which is the primary management tool. We do not expect the amount of prescribed burning to increase in the future, so we anticipate that existing habitat will continue to decline in quality and undergo habitat conversion to hammock habitats, particularly in eastern Miami-Dade County.

Climate Change—Future Impacts

In Florida, sea level is projected to rise between 1 ft (0.4 m) at the low end and up to 8.4 ft (3.2 m) at the high end by 2100 (USGS 2019b, p. 1). Due to sea level rise, low-lying islands and coastal areas have increasingly become more vulnerable to high tide flooding, which is rapidly increasing in frequency, depth, and extent (Sweet et al. 2018, p. 3). In South Florida as well as the Keys, storm surge and high tide flooding events primarily affect low-lying coastal areas and exposed habitats such as pine rocklands and rockland hammocks. With continued increase in sea level rise, high tide/king tide flood frequencies are also expected to rapidly increase, with potentially severe damage to remaining rockland habitat in the Florida Keys. Pine rocklands species, particularly the dominant canopy species (slash pine), have little ability to tolerate saltwater (USGS 2019b, p. 2). As mentioned above, pine rocklands

habitat has already undergone a significant reduction in the Florida Keys due to sea level rise (Ross et al. 1994, p. 154) and some of these areas are occupied by halophytic (salt-tolerant) vegetation such as mangroves and buttonwood (Alexander 1976, pp. 219–222). As discussed above in Background, a unique characteristic of the Florida Keys is the existence of a freshwater lens below each island that is critically important for humans, flora, fauna, and a variety of habitats.

In eastern Miami-Dade County, a shallow layer of highly permeable limestone forms the unconfined Biscayne aquifer. Because this aquifer is unconfined, the top-most layer makes up the water table and directly interacts with natural and humanmade bodies of water. The Biscayne aquifer merges with the floor of Biscayne Bay and the Atlantic Ocean, making it a coastal aquifer. Being a coastal aquifer, there is a potential for contamination from lowered water tables, primarily from over-pumping due to residential and commercial use, which could allow salt water intrusion and could be exacerbated by sea level rise.

The anticipated impacts of sea level rise and high tides for the rim rock crowned snake for our four future scenarios are shown below in tables 5–9. There is no table for pine rocklands habitat change in the upper Florida Keys, as there is no pine rocklands habitat there.

TABLE 5—PREDICTED PINE ROCKLANDS HABITAT CHANGES WITH AN INTERMEDIATE (I) OR EXTREME (E) RSLR (RELATIVE SEA LEVEL RISE; SWEET ET AL. 2017, PP. VI, VII, 12, 21) AND MODERATE HIGH TIDE EFFECT (2.7 FT (0.82 m)), IN THE YEARS 2040, 2060 AND 2080, IN EASTERN MIAMI-DADE COUNTY

Future scenario	RSLR height (m)	Year	Current pine rocklands (ac) in Miami-Dade	Area (ac) of pine rocklands affected by both RSLR and high tide	Percent of pine rocklands affected by both RSLR and high tide
1	0.31	2040 I	2,275.02	4.3	0.19
2	0.54	2060 I		13.6	0.60
3	0.83	2080 I		51.5	2.26
4	0.60	2040 E		20.3	0.89

TABLE 6—PREDICTED ROCKLAND HAMMOCK HABITAT CHANGES WITH AN INTERMEDIATE (I) OR EXTREME (E) RSLR (RELATIVE SEA LEVEL RISE; SWEET ET AL. 2017, PP. VI, VII, 12, 21) AND MODERATE HIGH TIDE EFFECT (2.7 FT (0.82 m)), IN THE YEARS 2040, 2060 AND 2080, IN EASTERN MIAMI-DADE COUNTY

Future scenario	RSLR height (m)	Year	Current rockland hammock (ac) in Miami-Dade	Area (ac) of rockland hammock affected by both RSLR and high tide	Percent of rockland hammock affected by both RSLR and high tide
1	0.31	2040 I	609.37	58.0	9.51
2	0.54	2060 I		78.9	12.95
3	0.83	2080 I		113.4	18.61
4	0.60	2040 E		85.7	14.06

TABLE 7—PREDICTED ROCKLAND HAMMOCK HABITAT CHANGES WITH AN INTERMEDIATE (I) OR EXTREME (E) RSLR (RELATIVE SEA LEVEL RISE; SWEET ET AL. 2017, PP. VI, VII, 12, 21) AND MODERATE HIGH TIDE EFFECT (2.7 FT (0.82 m)), IN THE YEARS 2040, 2060 AND 2080, IN THE UPPER FLORIDA KEYS

Future scenario	RSLR height (m)	Year	Current rockland hammock (ac) in upper Keys	Area (ac) of rockland hammock affected by both RSLR and high tide	Percent of rockland hammock affected by both RSLR and high tide
1	0.31	2040 I	7,005.60	3,273.8	46.73
2	0.54	2060 I		3,930.8	56.11
3	0.83	2080 I		4,686.5	66.90
4	0.60	2040 E		4,097.7	58.49

TABLE 8—PREDICTED PINE ROCKLANDS HABITAT CHANGES WITH AN INTERMEDIATE (I) OR EXTREME (E) RSLR (RELATIVE SEA LEVEL RISE; SWEET ET AL. 2017, PP. VI, VII, 12, 21) AND MODERATE HIGH TIDE EFFECT (2.7 FT (0.82 m)), IN THE YEARS 2040, 2060 AND 2080, IN THE LOWER FLORIDA KEYS

Future scenario	RSLR height (m)	Year	Current pine rocklands (ac) in lower Keys	Area (ac) of pine rocklands affected by both RSLR and high tide	Percent of pine rocklands affected by both RSLR and high tide
1	0.31	2040 I	1,899.35	1,674.4	88.16
2	0.54	2060 I		1,834.9	96.61
3	0.83	2080 I		1,898.9	99.98
4	0.60	2040 E		1,864.9	98.19

TABLE 9—PREDICTED ROCKLAND HAMMOCK HABITAT CHANGES WITH AN INTERMEDIATE (I) OR EXTREME (E) RSLR (RELATIVE SEA LEVEL RISE; SWEET ET AL. 2017, PP. VI, VII, 12, 21) AND MODERATE HIGH TIDE EFFECT (2.7 FT [0.82 m]), IN THE YEARS 2040, 2060 AND 2080, IN THE LOWER FLORIDA KEYS

Future scenario	RSLR height (m)	Year	Current rockland hammock (ac) in lower Keys	Area (ac) of rockland hammock affected by both RSLR and high tide	Percent of rockland hammock affected by both RSLR and high tide
1	0.31	2040 I	3,805.60	3,668.3	96.39
2	0.54	2060 I		3,749.5	98.53
3	0.83	2080 I		3,778.4	99.29
4	0.60	2040 E		3,758.2	98.75

Extreme weather events are another impact of climate change likely to impact pine rocklands and rockland hammock habitat. Plant species common to both habitats have little ability to tolerate salt stress due to saltwater intrusion or inundation owing to high tide events and sea level rise. Although the effects during severe storm events may be temporary, high mortality of pine rocklands and rockland hammock plant species may occur. Thus, climate change-induced storm events may reduce the resiliency of both pine rocklands and rockland hammock habitats.

Annual average temperature over the contiguous United States is projected to rise. Increases of approximately 2.5 °F (1.4 °C) are projected for the period 2021–2050 relative to 1976–2005 in all representative concentration pathway (RCP) greenhouse gas emission scenarios, implying recent record-

setting years may be common in the next few decades. Much larger increases in temperature are projected by late century (2071–2100): 2.8–7.3 °F (1.6–4.1 °C) in RCP 4.5 and 5.8–11.9 °F (3.2–6.6 °C) in RCP 8.5 (USGCRP 2018, p. 159). In addition, extreme heat events in Florida are projected to increase relative to 1986–2005 (Service 2017, p. 2). Due to the already released, human-induced emissions of greenhouse gases present in the environment, another 0.5 °F (0.3 °C) increase in surface air temperature would be expected, even if there was a sudden end to all human-induced greenhouse gas emissions (Carter *et al.* 2014, pp. 414–415). For the State of Florida, this would equate to an increase of more than 30 to 40 days of extreme heat events for Florida’s coastal areas (Service 2017, p. 2). An increase in temperature also causes an increase in evapotranspiration in plants, which will change vegetation growth and

survival, leading to changes in plant communities, which could indirectly affect rim rock crowned snakes.

Extreme rainfall events have increased in frequency and intensity in the southeastern United States, and there is high confidence they will continue to increase in the future. Both the frequency and severity of extreme precipitation events are projected to continue increasing in the southeast region (Easterling *et al.* 2017, p. 223). Future projections of average precipitation are uncertain, but an increase in intense rainfall is projected. Although average summer precipitation may not change, higher temperatures will increase the rate of soil moisture loss, and, thereby, droughts will likely be more intense (USGCRP 2018, pp. 1004, 1134). Dry consecutive days are expected to increase up to 30 percent in south Florida by 2100 (Service 2017, p. 7). Extreme conditions can be

detrimental for the rim rock crowned snake. Decreased water availability, exacerbated by population growth and land-use change, will continue to increase competition for water (USGCRP 2018, p. 1112). Increasing drought intensity will likely trigger more frequent wildfire events, which may be beneficial to rim rock crowned snake by increasing habitat quality. Additionally, greater rainfall rates during hurricanes are expected with about a 20 percent increase near the center of storms, increasing risks of severe and damaging flooding (Service 2017, pp. 4–5). Periods of extreme drought and/or heavy rainfall can cause losses and alteration in plant and animal communities, which could affect the rim rock crowned snake directly or indirectly. For example, with an increase in flooding frequency, rim rock crowned snakes may be more frequently displaced from underground refugia, leading to higher mortality risk. Alternatively, more periods of extreme drought may reduce the abundance of prey, decreasing the ability of rim rock crowned snakes to feed. Climate change-induced shifts in seasonal patterns of rainfall and temperature may reduce the rim rock crowned snake’s overall resiliency, especially when extreme events occur within areas of multiple populations.

Future Scenarios

In all four future scenarios, habitat supporting the rim rock crowned snake is expected to undergo significant losses due to regional sea level rise, particularly in the lower Florida Keys. Populations in Miami-Dade County would be the least impacted by regional sea level rise and saltwater intrusion. Under the highest climate impacts, by 2080, 18.6 percent of rockland hammock habitat and only 2.3 percent of pine rocklands habitat in Miami-Dade

County would be affected by regional sea level rise (see tables 5 and 6, above; see also Service 2021b, table 13). Therefore, no additional mortality in that part of the range from regional sea level rise and high tide would be expected due to little habitat loss or alteration. However, as discussed earlier, land development pressure on remaining undeveloped lands in pine rocklands is expected to be high, as is fire suppression. Of the 2,898 ac (1,173 ha) of suitable habitat in Miami-Dade County, 82.6 percent is protected; however, these areas will still be affected by ongoing habitat degradation. The remaining unprotected habitat (17.4 percent) will likely be lost or degraded due to high development pressure, which could result in total loss, encroachment, or fire suppression of the habitat. The result of these impacts is a decrease in resiliency for all populations in Miami-Dade County under all future scenarios (Table 10).

Storm events and associated storm surges will be a greater source of mortality and habitat alteration throughout the Florida Keys in all future scenarios, therefore reducing population resiliency. Projected sea level rise will increase the inland penetration and residence time of saltwater during storm surge events, and impact the freshwater lens, both of which will accelerate habitat modification and loss. Additionally, sea level rise in the Florida Keys will increase saltwater intrusion and inundation, and root zone salinity over the coming decades. This will result in the loss of habitat, changes in freshwater-dependent habitat, and loss of individual snakes. In the upper Florida Keys, between 46.7 and 58.5 percent of rockland hammock habitat could be lost to sea level rise, with the severity and timing varying with each

climate scenario (see table 7, above). The most severe impacts are expected in the lower Florida Keys, with habitat losses due to relative sea level rise and high tides of 88.2 and 96.4 percent of pine rocklands and rockland hammock habitats, respectively (see tables 8 and 9, above). Overall, we expect a trend toward a reduction of populations in the upper Florida Keys and probable extirpation of populations in the lower Florida Keys (table 10).

The ability of this species to adapt to changing environmental conditions is extremely limited. The rim rock crowned snake will not survive living in the anticipated more saline or more wet habitat, both of which will alter the vegetation community. This reduction in suitable habitat will lead to fewer populations and individuals occurring in the Keys. Therefore, a reduction in species representation in the lower and upper Florida Keys populations is expected. However, a reduction in species representation is not expected in the Miami-Dade County populations under any future scenario, despite a decline in resiliency of these populations.

Redundancy is currently low for the rim rock crowned snake, and with the continued loss or degradation to its habitat in the lower and upper Florida Keys as outlined above, we expect loss of populations, thereby further reducing the species’ ability to withstand catastrophic events such as hurricanes. Although the rim rock crowned snake populations in Miami-Dade County are largely unaffected in all future scenarios in that they are projected to remain extant, the loss of populations in the lower (extirpation by 2040) and upper Florida Keys leaves the rim rock crowned snake more vulnerable to extinction.

TABLE 10—PREDICTED POPULATION CONDITION OF THE RRCS UNDER FOUR SCENARIOS

Area	Current	2040I	2060I	2080I	2040E
Lower Florida Keys	Low	Possibly extirpated ...	Presumed extirpated	Presumed extirpated	Presumed extirpated
Upper Florida Keys	Low	Low	Low	Low	Low
Miami-Dade County	Moderate	Low	Low	Low	Low

Determination

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an “endangered species” as a species in danger of extinction throughout all or a significant portion of its range, and a “threatened species” as a species likely

to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of endangered species or threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial,

recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

For both the Key ring-necked snake and the rim rock crowned snake, we

presented summary evaluations of six threats analyzed in the SSAs: Development (Factor A), fire suppression (Factor A), sea level rise (Factor A), saltwater intrusion (Factor A), shifts in seasonal patterns of rainfall and temperature (Factor A), and storm events (Factor A). We also evaluated existing regulatory mechanisms (Factor D) and ongoing conservation measures. In the SSA, we also considered four additional potential threats: overutilization due to recreational, educational, and scientific use (Factor B); disease (Factor C); predation (Factor C), and invasive species (Factor E). We concluded that, as indicated by the best available scientific and commercial information, these four potential threats are currently having little to no impact on either the Key ring-necked snake or the rim rock crowned snake and their habitats, and thus their overall effects now and into the future are expected to be minimal. However, we consider them in the determination for each species, because although these minor threats may have low impacts on their own, combined with impacts of other threats, they could further reduce the already low number of Key ring-necked snakes or rim rock crowned snakes.

In considering the foreseeable future for the Key ring-necked snake and the rim rock crowned snake, we analyzed expected changes in development through 2070 based on the available model datasets, shifts in seasonal patterns of rainfall and temperature through 2100, and climate change (sea level rise and saltwater intrusion) from 2030 to 2100. That said, we focused on changes that are expected in the next 60 years because virtually no habitat for either species is forecasted to be present in the lower Florida Keys by 2080. We determined that this timeframe represents a period of time for which we can reliably predict both the threats to the species and the species' response to those threats.

Key Ring-Necked Snake: Status Throughout All of Its Range

The Key ring-necked snake is a narrow endemic that inhabits a limited range, with individuals recorded on seven islands. Historically, urban development and historical conversion of suitable habitat for agriculture greatly reduced the extent of suitable habitat for the Key ring-necked snake. Currently, degradation associated with urbanization and fire suppression of pine rocklands is decreasing the quality of remaining habitat, and thereby decreasing population resiliency. Much of the pine rockland habitat where the Key ring-necked snake is found is

protected; however, the remaining parcels are at very high risk of development. Since the Key ring-necked snake's range is so limited, any development of habitat that supports the subspecies would have a high level of impact on the subspecies, decreasing both population resiliency and the already limited redundancy.

Furthermore, effects associated with climate change and sea level rise (that is, higher tidal surges, coastal and inland flooding, saltwater intrusion) are already being observed in the Florida Keys. Before the effects of inundation due to sea level rise are fully realized, vegetation succession to a halophytic dominated habitat occurs as pine rockland plant species, particularly the dominant canopy species (slash pine), have little ability to tolerate saltwater. Thus, saltwater intrusion has resulted in degradation and loss of suitable pine rocklands habitat as well as the freshwater sources on which the Key ring-necked snake relies. Currently, habitat succession due to saltwater intrusion has resulted in conversion of suitable habitat for the Key ring-necked snake from rockland or hammock habitat into habitat that is unsuitable for the species such as salt-tolerant mangroves. Sea level rise is exacerbated by effects from increased rainfall and higher than average storm surges from hurricanes and other tropical storms. Because of their low mean elevation of less than 4 ft (1.2 m), the lowest parts of the Florida Keys are highly susceptible to flooding, with parts of the islands farther upland at risk of inundation and saltwater intrusion from these storm events. As a result of these ongoing impacts and others identified above, the seven known populations of the Key ring-necked snake are currently in low condition, and the overall viability of the species is likely reduced from historical levels.

The primary threat currently facing the Key ring-necked snake is climate change and sea level rise. All effects associated with climate change are interrelated, with increases in the magnitude of severe storms contributing to increased flooding events that have the potential to extirpate populations of the Key ring-necked snake. Although a severe hurricane is unlikely to flood all populations at once, if a hurricane were to extirpate most populations, it would leave the remainder of the subspecies significantly more vulnerable to other threats. In addition to effects associated with current rates of sea level rise, storms are also becoming more frequent and intense, accelerating habitat modification and further reducing population resiliency.

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find that the Key ring-necked snake is currently experiencing significant impacts due to development, fire suppression, climate change, and sea level rise throughout its very limited range. Because the Key ring-necked snake is endemic to only the lower Florida Key islands, and all populations for the species are in low condition due to impacts of threats (such as ongoing habitat degradation, fire suppression, and impacts from saltwater intrusion), we find the species is at a high risk of extinction. Thus, after assessing the best available information, we conclude that the Key ring-necked snake is in danger of extinction throughout all of its range.

Key Ring-Necked Snake: Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. We have determined that the Key ring-necked snake is in danger of extinction throughout all of its range and accordingly did not undertake an analysis of any significant portion of its range. Because the Key ring-necked snake warrants listing as endangered throughout all of its range, our determination does not conflict with the decision in *Center for Biological Diversity v. Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), which vacated the provision of the SPR Policy providing that if the Services determine that a species is threatened throughout all of its range, the Services will not analyze whether the species is endangered in a significant portion of its range.

Key Ring-Necked Snake: Determination of Status

Our review of the best available scientific and commercial information indicates that the Key ring-necked snake meets the definition of an endangered species. Therefore, we propose to list the Key ring-necked snake as an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

Rim Rock Crowned Snake: Status Throughout All of Its Range

The rim rock crowned snake is endemic to only the southeastern part of the Florida peninsula and the Florida Keys. Currently, the resiliency of the seven populations in the Miami-Dade area is moderate, and the resiliency of

the eight populations in the Florida Keys is low. However, the rim rock crowned snake is facing a variety of threats across its range. The effects of urbanization and degradation are impacting the rim rock crowned snake across its range, but the effects are particularly severe in eastern Miami-Dade County. Although 75 percent of remaining suitable habitat for the rim rock crowned snake in that part of the range is protected, the habitat is spread across Miami-Dade County in small, isolated fragments. These fragments are undergoing degradation due to edge effects, and pine rocklands habitat is being further degraded due to fire suppression, which causes it to undergo transition to dense canopy that is less suitable for the rim rock crowned snake. Thus, although individual populations are currently less likely to be lost to new development, ongoing habitat degradation associated with urbanization and fire suppression in pine rocklands will continue to reduce the availability of features that the rim rock crowned snake needs, thus decreasing population resiliency. Although several populations in this part of the species' range are extant, we expect the effects of habitat degradation will increase in magnitude into the future, particularly in pine rocklands habitat where prescribed burning does not occur, further reducing resiliency.

Rangewide, the rim rock crowned snake is also facing threats due to the ongoing occurrence of more severe storms and the increased incidence and intensity of storm surge that accompanies these storms. Increased rainfall, along with the threats of sea level rise and higher than average storm surges, is already reducing the amount of available habitat due to inundation, particularly within the Florida Keys. Because of their low mean elevation of less than 4 ft (1.2 m), the lowest parts of the Florida Keys are highly susceptible to flooding, with parts of the islands farther upland at risk of inundation and saltwater intrusion from these storm events. Saltwater intrusion has resulted in degradation and loss of suitable pine rocklands and rockland hammock habitats—through vegetation shifting to halophytic species—in the Florida Keys as well as the freshwater sources on which the rim rock crowned snake relies. All of this, in turn, negatively affects snake movement, reproduction, and food availability. Succession to more halophytic vegetation has likely altered the density and type of prey available to the rim rock crowned snake in these areas, decreasing population resiliency. In

addition, the underground spaces, such as the limestone substrate that the rim rock crowned snake inhabits, are vulnerable to sea level rise, and increased frequency in flooding of underground areas increases the amount of time that species are displaced from refugia. This displacement makes them more vulnerable to predation, and combined with losses of foraging and breeding opportunities (reproduction), this further decreases population resiliency. Although a severe hurricane would be unlikely to flood all populations across the species' range at once, if a hurricane were to extirpate multiple populations, it would leave the remainder of the species significantly more vulnerable to other threats, including threats that currently only have a minor impact on the species.

Given the species' limited distribution and limited ecological setting, species representation is currently low. However, the species has moderate redundancy, as it has multiple populations distributed throughout the Miami-Dade area (7 populations in moderate condition) and the Upper and Lower Florida Keys (8 populations in low condition). Thus, although these threats may cause the species to become endangered in the foreseeable future, we do not find that threats at their current magnitude are reducing resiliency and redundancy such that the species is in danger of extinction now across the species' range.

In the foreseeable future, we anticipate that threats associated with climate change, including the effects of storm events (for example, storm surges, high tide), saltwater intrusion, and sea level rise, will continue to increase in magnitude and have the greatest influence on population resiliency, particularly in the Florida Keys. Tropical storms will continue to become more frequent and intense, accelerating habitat modification and reducing population resiliency. Additionally, the Florida Keys will continue to face increased saltwater intrusion and sea level rise, which will continue to cause habitat alteration and loss. Acting together, these threats will cause irreversible habitat modification and loss that will be further exacerbated by ongoing and increasing levels of inundation. Populations of the rim rock crowned snake in the lower and upper Florida Keys may begin experiencing significant losses in the next 10–20 years. By 2040, the upper Keys populations will experience loss of nearly half of its current habitat and the lower Keys populations may potentially be extirpated.

In Miami-Dade County, the effects of storm events (for example, storm surges, high tide), saltwater intrusion, and sea level rise would not exert much influence on population resiliency in the foreseeable future. However, given that there is a relatively low amount of suitable habitat to begin with (2,898 ac (1,172.8 ha)) when compared to the Florida Keys (12,711 ac (5,144 ha)), additional threats may exert pressure, which in combination, could stress the resiliency of the Miami-Dade populations, and further reduce species redundancy as a whole in the future. Dispersal of individual snakes to other populations is unlikely and would only occur in isolated, random circumstances.

The urban environment of metropolitan Miami presents many challenges for dispersing snakes, including roads, highways, commercial and residential development, canals, and vast storm water retention areas. Encroachment and degradation are likely to increase in magnitude in the foreseeable future for most remaining habitat, and risk of development of the 25 percent of unprotected suitable habitat in Miami-Dade County is high. As the urban interface of metropolitan Miami increases in density, the likelihood of prescribed burning decreases, which in turn decreases remaining habitat quality. If the habitat in Miami-Dade County is the only remaining habitat within the rim rock crowned snake's range due to the effects of climate change discussed above in the Florida Keys, extinction may occur much more quickly due to the small amount of suitable habitat left on the mainland, which will likely degrade in quality, with populations becoming increasingly isolated from one another.

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find that the rim rock crowned snake is facing threats across its range due to development, fragmentation, and effects associated with climate change. However, the species currently maintains enough population resiliency and species redundancy that it is not in danger of extinction now. Within the foreseeable future, unprotected habitat in eastern Miami-Dade County will continue to be lost due to development, and protected habitat will continue to undergo degradation due to edge effects and fire suppression. In the Florida Keys, up to half of available habitat in the upper Keys and nearly all habitat in the lower Keys could be lost by 2040. Thus, after assessing the best available information, we conclude that the rim rock crowned

snake is not currently in danger of extinction but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Rim Rock Crowned Snake: Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. The court in *Everson* vacated the aspect of the Final Policy on Interpretation of the Phrase “Significant Portion of Its Range” in the Endangered Species Act’s Definitions of “Endangered Species” and “Threatened Species” (Final Policy) (79 FR 37578; July 1, 2014) that provided that the Service does not undertake an analysis of significant portions of a species’ range if the species warrants listing as threatened throughout all of its range. Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species’ range for which both (1) the portion is significant; and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the “status” question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species’ range.

Following the court’s holding in *Everson*, we now consider whether there are any significant portions of the species’ range where the species is in danger of extinction now (that is, endangered). In undertaking this analysis for the rim rock crowned snake, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species is endangered.

For the rim rock crowned snake, we considered whether there are any portions of the species’ current range that may have a different status. We identified the Florida Keys portion of the species’ range because all eight populations are currently in low condition. Within the Florida Keys, the effects associated with climate change and sea level rise (that is, higher tidal surges, coastal and inland flooding, saltwater intrusion) are already being

observed. Before the effects of inundation due to sea level rise are fully realized, vegetation succession to a halophytic dominated habitat occurs as pine rockland species, particularly the dominant canopy species (slash pine), have little ability to tolerate saltwater. Thus, saltwater intrusion has resulted in degradation and loss of suitable pine rocklands habitat as well as the freshwater sources on which the rim rock crowned snake relies. Currently, habitat succession due to saltwater intrusion has resulted in conversion of suitable habitat for the rim rock crowned snake from rockland or hammock habitat into habitat that is unsuitable for the species, such as salt-tolerant mangroves. Succession to more halophytic vegetation has likely altered the density and type of prey available to the rim rock crowned snake in these areas, decreasing population resiliency.

Sea level rise is exacerbated by effects from increased rainfall and higher than average storm surges from hurricanes and other tropical storms. Underground spaces, such as the limestone substrate that the rim rock crowned snake inhabits, are vulnerable to sea level rise. Increased frequency in flooding of subterranean areas increases the amount of time that species are displaced from refugia, making them more vulnerable to predation and extreme temperatures. This, combined with losses of foraging and breeding opportunities, further decreases population resiliency.

As mentioned above, within the Florida Keys portion, the eight populations currently have low resiliency. Given the species’ current condition within the Keys and ongoing impacts from climate change and sea level rise which are already being realized, we find that the Florida Keys portion of the rim rock crowned snake is in danger of extinction.

We then proceeded to the significance question, asking whether this portion of the range (*i.e.*, the Florida Keys portion of the rim rock crowned snake) is significant. The Service’s most recent definition of “significant” within agency policy guidance has been invalidated by court order (see *Desert Survivors v. U.S. Department of the Interior*, 321 F. Supp. 3d 1011, 1070–74 (N.D. Cal. 2018)). In undertaking this analysis for the rim rock crowned snake, we considered whether the Florida Keys portion of the species’ range may be significant based on its biological importance to the overall viability of the rim rock crowned snake. Therefore, for the purposes of this analysis, when considering whether this portion is significant, we considered whether the portion may (1) occur in a unique

habitat or ecoregion for the species, (2) contain high quality or high value habitat relative to the remaining portions of the range, for the species’ continued viability in light of the existing threats, (3) contain habitat that is essential to a specific life-history function for the species and that is not found in the other portions (for example, the principal breeding ground for the species) or (4) contain a large geographic portion of the suitable habitat relative to the remaining portions of the range for the species.

The Florida Keys portion of the range contains the largest patches of intact pine rockland and rockland hammock habitats within the rim rock crowned snake’s range. Currently, the Florida Keys accounts for roughly 82 percent (12,711 of 15,595 ac (5,144 of 6,311 ha)) of suitable pine rockland and rockland hammock habitat and 53 percent (8 of 15) of extant populations within the range of the rim rock crowned snake. In the lower Florida Keys, the total area of pine rocklands habitat is approximately 1,899 ac (769 ha), and the total area of rockland hammock habitat is approximately 3,806 ac (1,540 ha). While the hammock habitats are widespread across many islands in various sizes, pine rocklands remain on only five islands in the lower Florida Keys and none of the upper Florida Keys. The total area covered by rockland hammock in the upper Florida Keys is 7,006 ac (2,835 ha). The Florida Keys portion constitutes a large geographic area relative to the remaining portions of the range, as this area encompasses 82 percent of the rangewide suitable habitat for the rim rock crowned snake. Therefore, having assessed the Florida Keys portion’s biological significance in terms of the above habitat considerations, we find the information substantially indicates this portion is significant to the rim rock crowned snake.

Accordingly, having determined that the Florida Keys portion of the species’ range (1) is significant, and (2) is currently in danger of extinction, we find the rim rock crowned snake meets the definition of an endangered species. This is consistent with the courts’ holdings in *Desert Survivors v. Department of the Interior*, 321 F. Supp. 3d 1011 (N.D. Cal. 2018), and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017)

Rim Rock Crowned Snake: Determination of Status

Our review of the best available scientific and commercial information indicates that the rim rock crowned snake meets the Act’s definition of an

endangered species. Therefore, we propose to list the rim rock crowned snake as an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

Available Conservation Measures

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

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

The recovery planning process begins with development of a recovery outline made available to the public soon after a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions while a recovery plan is being developed. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) may be established to develop and implement recovery plans. The recovery planning process involves the identification of actions that are necessary to halt and reverse the species' decline by addressing the threats to its survival and recovery. The recovery plan identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened ("downlisting") or removal from protected status ("delisting"), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate

their recovery efforts and provide estimates of the cost of implementing recovery tasks. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery outline, draft recovery plan, final recovery plan, and any revisions will be available on our website as they are completed (<https://www.fws.gov/endangered>), or from our Florida Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (for example, restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If these species are listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. Additionally, pursuant to section 6 of the Act, the State of Florida would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Key ring-necked snake and the rim rock crowned snake. Information on our grant programs that are available to aid species recovery can be found at: <https://www.fws.gov/service/financial-assistance>.

Although the Key ring-necked snake and the rim rock crowned snake are only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for these species. Additionally, we invite you to submit any new information on these species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat. Regulations implementing this interagency

cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

For the Key ring-necked snake, Federal agency actions within the species' habitat that may require conference, consultation, or both, with the Service as described in the preceding paragraph could include management and any other landscape-altering activities on Federal lands administered by the administered by the Service (National Key Deer Refuge); issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; construction and management of pipeline and power line rights-of-way by the Federal Energy Regulatory Commission; construction and maintenance of roads, bridges, or highways by the Federal Highway Administration.

For the rim rock crowned snake, Federal agency actions within the species' habitat that may require conferencing with the Service as described in the preceding paragraph could include management and any other landscape-altering activities on Federal lands administered by the administered by the Service (National Key Deer Refuge, Crocodile Lake National Wildlife Refuge); issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; construction and management of pipeline and power line rights-of-way by the Federal Energy Regulatory Commission; construction and maintenance of roads, bridges, or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any species listed as an endangered species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

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

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing. Based on the best available information, the following actions are unlikely to result in a violation of section 9 for the Key ring-necked snake or the rim rock crowned snake, if these activities are carried out in accordance with existing regulations and permit requirements; this list is not comprehensive:

(1) Recreational use with minimal ground disturbance (for example, hiking, walking); and

(2) Herbicide and pesticide use that is carried out in accordance with any existing regulations, permit and label requirements, and best management practices.

Based on the best available information, the following activities may potentially result in a violation of section 9 of the Act for the Key ring-necked snake or rim rock crowned snake if they are not authorized in accordance with applicable law; this list is not comprehensive:

(1) Unauthorized handling or collecting of the species;

(2) Sale or purchase of specimens, except for properly documented antique specimens of this taxon at least 100 years old, as defined by section 10(h)(1) of the Act.

(3) Activities resulting in ground disturbance in occupied Key ring-necked snake or rim rock crowned snake habitat (for example, plowing, mowing, burning, land leveling or clearing, grading, disking, soil compaction, soil removal, dredging, excavation, deposition of dredged or fill material, erosion and deposition of sediment/soil);

(4) Introduction of nonnative species that compete with or prey upon the Key ring-necked snake or rim rock crowned snakes.

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

II. Critical Habitat for the Key Ring-Necked Snake and the Rim Rock Crowned Snake

Background

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

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features:

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

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

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

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

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the

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

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

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

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

designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. As discussed above, the court in *CBD v. Haaland* vacated the 2019 regulations which modified the criteria for designating critical habitat, including designating critical habitat in areas outside the geographical area occupied by the species. Therefore, the regulations that now govern designations of critical habitat, are those regulations that published on February 11, 2016 (81 FR 7438).

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

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

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are

important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of these species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, HCPs, or other species conservation planning efforts if new information available at the time of those planning efforts calls for a different outcome.

Prudency Determination

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

- (i) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species; or
- (ii) Such designation of critical habitat would not be beneficial to the species. In determining whether a designation would not be beneficial, the factors the Services may consider include but are not limited to: Whether the present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species, or whether any areas meet the definition of "critical habitat."

As discussed earlier in this document, there is currently no imminent threat of collection or vandalism identified under Factor B for this species, and identification and mapping of critical habitat is not expected to initiate any such threat. In our SSAs and proposed listing determinations for the Key ring-necked snake and the rim rock crowned snake, we determined that the present

or threatened destruction, modification, or curtailment of habitat or range is a threat to both species. Accordingly, critical habitat is likely to be beneficial for the species. Therefore, because none of the circumstances enumerated in our regulations at 50 CFR 424.12(a)(1) have been met and because the Secretary has not determined that designation of critical habitat would not be prudent based on the best scientific data available, we have determined that the designation of critical habitat is prudent for both the Key ring-necked snake and the rim rock crowned snake.

Critical Habitat Determinability

Having determined that designation is prudent, under section 4(a)(3) of the Act we must find whether critical habitat for the Key ring-necked snake and the rim rock crowned snake is determinable. Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

- (i) Data sufficient to perform required analyses are lacking, or
- (ii) The biological needs of the species are not sufficiently well known to identify any area that meets the definition of "critical habitat."

When critical habitat is not determinable, the Act allows the Service an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

We reviewed the available information pertaining to the biological needs of the species and habitat characteristics where this species is located. This and other information representing the best scientific data available led us to conclude that the designation of critical habitat is determinable for the Key ring-necked snake and the rim rock crowned snake.

Physical or Biological Features

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas we will designate as critical habitat from within the geographical area occupied by the species at the time of listing, we consider the physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection. The regulations at 50 CFR 424.02 define "physical or biological features" as the features that support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex

combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features essential to the conservation of the species might include gravel of a particular size required for spawning, alkaline soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or absence of a particular level of nonnative species consistent with conservation needs of the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

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

Space for Individual and Population Growth and for Normal Behavior

The Key ring-necked snake and the rim rock crowned snake are endemic to, and occur exclusively within, pine rocklands and rockland hammock habitat; the Key ring-necked snake occurs only in the lower Florida Keys, and the rim rock crowned snake occurs in Miami-Dade County and throughout the Florida Keys. Pine rocklands are a fire-adapted/maintained ecosystem characterized by an open canopy (sparsely spaced pine trees) and understory (grasses and forbs/herbs) and a limestone substrate (often exposed) with sparse soils on top. This combination of ecosystem characteristics (open canopy and limestone substrate) occurs only in the pine rocklands habitat of south Florida.

Pine rocklands habitat that supports the rim rock crowned snake is characterized by an open canopy of south Florida slash pine. Subcanopy development is rare in well-maintained pine rocklands with only occasional hardwoods such as wild tamarind (*Lysiloma bahamensis*) and live oak (*Quercus virginiana*). The shrub/understory layer is also characteristically open, although the height and density of the shrub layer varies based on fire frequency, with understory plants growing taller and denser as the time between fires increases.

While the amount of pine rocklands and/or rockland hammock habitat necessary to support Key ring-necked snake and rim rock crowned snake individual and population growth and normal behavior is unknown, preservation of these features is essential for the species.

Food, Water, Air, Light, Minerals, or Other Nutritional or Physiological Requirements

The Key ring-necked snake diet is assumed to be similar to other *Diadophis* species (for example, the southern ring-necked snake), which prey upon small insects, snakes, lizards, slugs, amphibians, and earthworms (Ernst and Ernst 2003, p. 96; FWC 2013, p. 2). The rim rock crowned snake diet is assumed to be similar to other *Tantilla* species (for example, the southeastern crowned snake), which prey upon centipedes, insects, and other small invertebrates such as tenebrionid beetle larvae, earthworms, snails, centipedes, spiders, cutworms, wireworms, and termites and their larvae (Ernst and Ernst 2003, pp. 353–355). The prey-related requirements (abundance, diversity, range, etc.) for a population of either species to maintain viability is unknown.

Water is essential for survival of the Key ring-necked snake and rim rock crowned snake. We have no specific information on the amount of water they require; however, the Key ring-necked snake and species of crowned snake similar to the rim rock crowned snake appear to be restricted to areas near permanent freshwater sources that often occur as small holes in the limestone (Lazell 1989, pp. 134, 136). Small amounts of water can be found in depressions and holes in the limestone substrate of pine rocklands and rockland hammock habitat, which fill from rain or overnight dew fall. The extensive network of holes, tunnels, and cavities in the limestone substrate most likely assists in creating more permanent water sources. During time

of drought, these sources may become scarce and the Key ring-necked snake and the rim rock crowned snake may need to seek out other fresh water sources. Consequently, it is important for the Key ring-necked snake and the rim rock crowned snake to have multiple freshwater sources in case one becomes depleted, contaminated, or unavailable. If all local water sources within a snake's home range become dry, the snake may need to expend more energy and time in search of new water sources (Zug et al. 2001, p. 208).

Cover or Shelter

Key ring-necked snakes and rim rock crowned snakes require refugia to escape and hide from predators and regulate body temperature. Currently, there is no specific information on the exact requirement for suitable refugia. The Key ring-necked snake and the rim rock crowned snake are mostly fossorial species that likely inhabit holes and crevices in the limestone, piles of rock rubble, and pockets of organic matter accumulating in solution holes and shallow depressions in the oolitic limestone (Enge et al. 2003, pp. 27–28). Snakes are ectothermic organisms which require an external heat source to warm their bodies in order to increase body function and productivity. Snakes can also become too hot, leading to desiccation. Therefore, a warm, moist microhabitat, typically subterranean or shielded from the sun, is likely preferred refugia to escape from predators and to properly maintain suitable internal temperature and moisture levels.

Sites for Breeding, Reproduction, or Rearing (or Development) of Offspring

Life-history characteristics of the Key ring-necked snake are thought to be similar to the southern ring-necked snake. In general, mating of ring-necked snakes can occur in the spring or fall, delayed fertilization is possible, and females lay 1 to 10 eggs (1 clutch per year) in covered, moist locations in June or early July (Ernst and Ernst 2003, p. 95). Juveniles are thought to hatch in August and September. For the rim rock crowned snake, life-history characteristics are thought to be similar to the southeastern crowned snake. In general, females may lay up to three eggs in a clutch and may be able to produce two clutches annually (Ernst and Ernst 2003, pp. 353–355).

Based on their small size and limited range, eggs, juveniles, and adults likely are found in the same habitat.

Habitats That Are Protected From Disturbance or Are Representative of the Historic Geographical and Ecological Distributions of a Species

Pine rocklands habitat is currently listed as critically imperiled globally (FNAI 2010, p. 3). Urban development and agriculture has greatly reduced the extent of pine rocklands in eastern Miami-Dade County and the Florida Keys. Within this range, the quality of remaining pine rocklands has declined because they are isolated and confined by surrounding urban development, which restricts the use of prescribed fire that is the principal management tool. Prescribed fire must be periodically introduced to sustain a proper community structure. In general, pine rocklands depend on a fire regime composed of a surface fire of low or mixed intensity, and a 5–7 year fire return interval.

In the absence of fire, pine rocklands are invaded by many of the species found in hardwood hammocks, they lose their herbaceous flora, and they move along a successional trajectory toward hammock (Service 1999, p. 3–173). These rockland hammocks are generally present where pine rocklands were not burned for a long period of time, creating more pine rocklands fragmentation. Rockland hammock consists of a more closed canopy containing more hardwood shrubs and trees due to a rare or infrequent fire regime. Rockland hammock is a hardwood forest that represents an advanced successional stage of pine rocklands that results from the absence of fire.

This fragmentation of pine rocklands and rockland hammock in eastern Miami-Dade County and the Florida Keys increases the risk of invasion by exotic vegetation along the interface with disturbed or developed areas, further altering, degrading, or destroying suitable habitat for the Key ring-necked snake and rim rock crowned snake.

Because the Key ring-necked snake and the rim rock crowned snake have been documented in both habitat types, it is not clear if one or the other is more suitable for either species. Populations of the Key ring-necked snake and the rim rock crowned snake are supported by the existence of suitable available habitat across their ranges. Therefore, a strong correlation to habitat availability and populations of these snakes can be assumed, but not at a level of certainty in which the presence of rockland hammock or pine rockland habitat can be used as a surrogate for presence. We do not know how much suitable habitat and habitat connectivity is required for

populations of either the Key ring-necked snake or the rim rock crowned snake to maintain viability. That said, the most influential need at a population level for both species is available suitable habitat. There may be distinct, non-interbreeding populations at each island or isolated parcel, or there may be some rare dispersal between some parcels or from rafting between some islands providing at least a low level of connectivity between individual populations. Because the Key ring-necked snake appears to be isolated to the lower Florida Keys and the rim rock crowned snake appears restricted to the Florida Keys and eastern Miami-Dade County, the relatively small, patchily distributed islands or parcels can each support only a small number of individuals or separate populations. The distribution and quantity of available suitable habitat across the range necessary to support populations of either the Key ring-necked snake or the rim rock crowned snake are unknown.

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of the Key ring-necked snake and the rim rock crowned snake from studies of the species' habitat, ecology, and life history as described above. Additional information can be found in the SSA reports (Service 2021a, entire; Service 2021b, entire), both of which are available on <https://www.regulations.gov> under Docket No. FWS–R4–ES–2022–0022. We have determined that the following physical or biological features are essential to the conservation of the Key ring-necked snake and the rim rock crowned snake:

- (1) Pine rocklands habitat that contains:
 - (a) Refugia consisting of a limestone rock substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;
 - (b) Suitable prey;
 - (c) Warm, moist microhabitats to maintain homeostasis; and
 - (d) A natural or prescribed fire regime at 5- to 7-year intervals that maintains the pine rocklands habitat and associated plant community.
- (2) Rockland hammock habitat that contains:
 - (a) Refugia consisting of a limestone rock substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;
 - (b) Suitable prey;
 - (c) Warm, moist microhabitats to maintain homeostasis; and

- (d) Little or no fire maintenance.

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features that are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the Key ring-necked snake and the rim rock crowned snake may require special management considerations or protection to reduce threats posed by: Land use conversion, primarily due to urban, agricultural, and recreational use; encroachment of invasive species; activities that cause surface or subsurface disturbance; fire suppression and low fire frequencies (pine rocklands); destructive fires in rockland hammock; random effects of drought or floods; and fragmentation from new roads or development. Management activities that could ameliorate these threats include (but are not limited to): Maintaining suitable pine rocklands and rockland hammock habitats in areas with existing populations through prescribed fire, mechanical treatments (that is, brush clearing, herbicide treatment), and invasive species control; restoring historical habitat and establishing new populations in the lower, middle, and upper Florida Keys or Miami-Dade County (rim rock crowned snake only); controlling exotic and invasive plant management plan; prohibiting management activities that could cause surface or subsurface disturbance unless carried out in accordance with a habitat management plan developed by a Federal, State, or County entity that identifies those areas where pine rocklands habitat is succeeding to hardwood-dominant habitat based on fire suppression, or to halophilic vegetation due to sea level rise; establishing and enhancing connectivity between currently occupied populations and adjacent suitable habitat; facilitating habitat restoration through the use of prescribed fire every 5 to 7 years for pine rocklands habitat; and implementing habitat management plans based on site-specific conditions for rockland hammock habitat.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR

424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat.

For the Key ring-necked snake, we are not currently proposing to designate any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that are essential for the conservation of the species.

For the rim rock crowned snake, we are proposing to designate critical habitat in areas outside the geographical area occupied by the species at the time of listing because we have determined that those areas are essential for the conservation of the species. We have determined that the unoccupied areas contain one or more of the physical or biological features essential to the species and are essential because by the year 2040, all suitable habitat for rim rock crowned snake in the lower Florida Keys and up to half of suitable habitat in the upper Florida Keys will be affected by sea level rise and saltwater intrusion. Therefore, we identified suitable habitat in Miami-Dade County that is essential to provide for species redundancy into the foreseeable future.

Sources of data for these two species and their habitat requirements include multiple databases maintained by museums, universities, and State agencies in Florida; papers by researchers involved in wildlife biology and conservation activities; peer-reviewed articles on these species and/or their relatives; State agency reports; and numerous survey reports for projects throughout the species' ranges.

For areas within the geographic area occupied by the Key ring-necked snake and the rim rock crowned snake at the time of listing, we delineated critical habitat unit boundaries using the following criteria:

(1) We determined occupied areas for each species by reviewing the best available scientific and commercial data on occurrence records. The range of survey records was selected due to scarcity of records throughout the range of each species. As discussed in Background, both species are extremely cryptic and spend most of their time underground. Because of their cryptic nature, we determined that if suitable habitat containing the physical or biological features was still present in an area where a Key ring-necked snake or a rim rock crowned snake was previously detected, that there was a

high likelihood that the species would still be present even if it had not been recently detected. Therefore, based on the best available information, in order to determine occupied areas for the species, we used occurrence points ranging from 2010 to present for the Key ring-necked snake and 1996 to present for the rim rock crowned snake.

(2) We selected all suitable habitat (habitat that contained the physical or biological features) within a 1-mi (1.6-km) radius of an occurrence record. A 1-mi radius was based on the maximum recapture distance of 1 mi (1.6 km) recorded during a demographic study of the ringneck snake in Kansas (Fitch 1975, p. 25).

(3) We selected additional contiguous suitable habitat that contained all the physical or biological features (PBFs) that extended beyond the 1-mi (1.6-km) radius to include dispersal areas for the two species.

(4) We then constrained the boundary of a critical habitat unit based on potential effects of physical barriers (for example, roads wider than 2 lanes or water) that cause habitat fragmentation and prevent connectivity and dispersal opportunities within units, as we consider that individuals of either species would be unable or unlikely to pass such barriers.

We conclude that the occupied areas we are proposing for critical habitat provide for the conservation of both species, because they are suitable habitat that contain all the physical or biological features for all extant populations and facilitate connectivity and dispersal opportunities within units.

As previously stated, we also identified unoccupied areas for the rim rock crowned snake to be essential for its conservation. For areas outside the geographic area occupied by the species at the time of proposed listing for the rim rock crowned snake, we first looked for areas historically occupied by the rim rock crowned snake. However, many areas where rim rock crowned snakes were historically observed have been converted due to urban and agricultural development and are no longer suitable for the species. Further, populations in the Florida Keys are vulnerable to sea level rise now and will become more vulnerable in the foreseeable future. Therefore, we have determined that in order to recover the species, additional populations will need to be established in high-quality pine rockland or rockland hammock habitat that is actively protected and managed. We searched for other areas within the historical geographic area occupied by the species that contain

high-quality pine rocklands or rockland hammock habitat and evaluated each site for its potential conservation based on quality of habitat, vulnerability to sea level rise, and existing protections and management of the habitat and sites. Based on these criteria, we identified two areas that contain appropriate habitat for the species (all physical or biological features essential for the conservation of the species are present in these areas) but for which we could not verify whether the areas were occupied. Accordingly, we find these areas unoccupied. The two unoccupied areas are located within the historical range as well as within Miami-Dade County far enough inland such that effects from projected sea level rise would have minimal impact to habitat. Therefore, we include these two areas as proposed critical habitat for the purpose of reestablishing populations, which are essential for the conservation of the species since populations are likely to be lost in the lower and upper Florida Keys due to projected sea level rise. Furthermore, the addition of two reestablished populations in Miami-Dade County would increase the redundancy of the species and reduce the chance that a catastrophic event would eliminate all populations in this area.

We conclude that these areas are essential for the conservation of the species because they provide areas for reestablishing populations, and they are high-quality habitat that contain all the physical or biological features for the rim rock crowned snake.

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

For the Key ring-necked snake, we propose to designate as critical habitat lands that we have determined are occupied at the time of listing (that is, currently occupied) and that contain all of the physical or biological features that are essential to support life-history processes of the subspecies. Our proposed critical habitat designation includes all areas currently occupied by the species. For the rim rock crowned snake only, as discussed above, we have also identified, and propose for designation as critical habitat, unoccupied areas that are essential for the conservation of the species.

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

including all unoccupied units for the rim rock crowned snake.

The proposed critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on <https://www.regulations.gov> at Docket No. FWS-R4-ES-2022-0022 and on our internet site (<https://www.fws.gov/office/florida-ecological-services>).

Proposed Critical Habitat Designation for the Key Ring-Necked Snake

We are proposing four units as critical habitat for the Key ring-necked snake. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for the Key ring-necked snake. The four areas we propose as critical habitat are: (1) Big Pine Key, (2) Middle Torch Key, (3) Cudjoe Key, and (4) Stock Island. Table 11 shows the proposed critical habitat units, the land ownership, and the approximate area of each unit. All proposed units for the Key ring-necked snake are occupied.

TABLE 11—PROPOSED CRITICAL HABITAT UNITS FOR THE KEY RING-NECKED SNAKE

[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Land ownership by type	Size of unit in acres (hectares)	Occupied?
1. Big Pine Key	Federal	1,174 (475)	Yes
	State	366 (148)	
	Local/County	62 (25)	
	Private	77 (31)	
	Unknown/Undefined	54 (22)	
2. Middle Torch Key	Federal	59 (24)	Yes
	State	211 (85)	
	Private	57 (23)	
	Unknown/Undefined	29 (12)	
3. Cudjoe Key	Federal	332 (134)	Yes
	State	76 (31)	
	Local/County	45 (18)	
	Private	28 (11)	
	Unknown/Undefined	26 (10)	
4. Stock Island	Local/County	8 (3)	Yes
Total		2,604 (1,054)	

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all units and reasons why they meet the definition of critical habitat for the Key ring-necked snake, below.

Unit 1: Big Pine Key

Unit 1 encompasses 1,734 ac (702 ha) within Monroe County in the lower Florida Keys and contains all of the essential physical or biological features for the subspecies. This unit is occupied. The northern portion of the unit is located in a primarily rural area. The habitat associated with the central and southern portions of the unit is located in rural areas but is sparsely fragmented by two-lane roads and residential and commercial development. The majority of habitat in this unit is federally owned by the Service, within the National Key Deer Wildlife Refuge, while other large tracts are owned by the National Park Service and the State of Florida. Smaller tracts

of habitat are owned by Monroe County, local government, and private entities. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 2: Middle Torch Key

Unit 2 encompasses approximately 356 ac (144 ha) within Monroe County in the lower Florida Keys and contains all of the essential physical or biological features for the subspecies. This unit is occupied. The State owns a significant portion of the habitat in this unit and a smaller portion is owned by both Federal and private entities. The State of Florida and the Service own and manage the Florida Keys Wildlife and Environmental Area and the National Key Deer Wildlife Refuge, respectively.

The habitat is only slightly fragmented in the center and at the northern- and southern-most locations. The slight habitat fragmentation is due to a small amount of residential development and a two-lane road. The physical or biological features in this unit may require special management to protect them from development. This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 3: Cudjoe Key

Unit 3 encompasses five subunits that total approximately 507 ac (205 ha) within Monroe County in the lower Florida Keys and contains all of the essential physical or biological features for the subspecies. This unit is occupied. In the two southern-most subunits, the habitat is fragmented by two- and four-lane roads and residential and commercial development. The habitat associated with the other three

subunits is located in rural areas, only sparsely fragmented by two-lane roads and residential and commercial development. The majority of the habitat in this unit is owned and managed by the Service and associated with the National Key Deer Wildlife Refuge. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 4: Stock Island

Unit 4 encompasses approximately 8 ac (3 ha) within Monroe County in the lower Florida Keys and contains all of

the essential physical or biological features for the subspecies. This unit is occupied. The habitat in this unit is surrounded and/or fragmented by residential and commercial development. The vast majority of habitat is owned by the City of Key West. The physical or biological features in this unit may require special management to protect them from development. This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Proposed Critical Habitat Designation for the Rim Rock Crowned Snake

We are proposing 11 units as critical habitat for the rim rock crowned snake. The critical habitat areas we describe

below constitute our current best assessment of areas that meet the definition of critical habitat for the rim rock crowned snake. The 11 areas we propose as critical habitat are: (1) Richmond Pine Rocklands, (2) Deering Estate Complex/Bill Sadowski Park, (3) Barnacle, (4) Camp Owaissa Bauer, (5) Navy Wells, (6) North Key Largo, (7) Key Largo, (8) Tavernier, (9) Vaca Key, (10) Big Pine Key, (11) Key West. Table 12 shows the proposed critical habitat units, the approximate area of each unit, the ownership of each unit, and whether the unit is occupied.

TABLE 12—PROPOSED CRITICAL HABITAT UNITS FOR THE RIM ROCK CROWNED SNAKE
[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Land ownership by type	Size of unit in acres (hectares)	Occupied?
1. Richmond Pine Rocklands	Federal	160 (65)	Yes
	Local/County	513 (208)	
	Private	144 (58)	
2. Deering Estate Complex/Bill Sadowski Park	State	241 (98)	Yes
	Local/County	19 (8)	
	Private	31 (13)	
3. Barnacle	State	3 (1)	Yes
	Private	1 (0.4)	
	Unknown/Undefined	1 (0.4)	
4. Camp Owaissa Bauer	State	9 (4)	No
	Local/County	83 (34)	
	Private	4 (2)	
5. Navy Wells	State	85 (34)	No
	Local/County	240 (97)	
	Private	0.05 (0.02)	
6. North Key Largo	Federal	601 (243)	Yes
	State	1,484 (601)	
	Local/County	24 (9)	
7. Key Largo	Private	53 (21)	Yes
	State	151 (61)	
	Local/County	56 (23)	
8. Tavernier	Private	91 (37)	Yes
	State	98 (40)	
	Local/County	30 (12)	
9. Vaca Key	Private	54 (22)	Yes
	County/Local	1 (0.4)	
	Private	58 (23)	
10. Big Pine Key	Federal	1,200 (486)	Yes
	State	380 (154)	
	Local/County	71 (29)	
11. Key West	Private	77 (31)	Yes
	Local/County	5 (2)	
	Private	3 (1)	
Total		5,972 (2,418)	

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all units and reasons why they meet the definition of critical habitat for the rim rock crowned snake below.

Unit 1: Richmond Pine Rocklands

Unit 1 consists of 817 ac (331 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Miami-Dade County, this unit is fragmented by commercial and residential

development, Federal and local government installations, and the Zoo Miami facility. Unit 1 is completely surrounded by a dense urban matrix typical of the Miami metropolitan area. Habitat areas associated with Unit 1 have experienced a significant amount

of sustained and recent urban development contributing to habitat loss but also have been the focus of land acquisition for conservation. A recent private land development project within the boundaries of the proposed unit has contributed to fragmentation and loss of suitable habitat. Several large tracts of suitable habitat are owned by Miami-Dade County, but only a fraction are managed and protected in perpetuity. The remainder are protected as Natural Forest Communities (NFCs). This program provides only temporary protection, habitat management is not required, and a portion of the parcel may be developed. Landowners include Federal Government agencies (U.S. Coast Guard, U.S. Army Corps of Engineers, and U.S. Office of Public Buildings), Miami-Dade County, University of Miami (private), and other private entities. Approximately 80 ac (32 ha) of the U.S. Coast Guard property is proposed for designation as critical habitat in this unit. The Coral Reef Commons HCP has been finalized to protect and manage 53 ac (21 ha) of pine rocklands (north end of Unit 1) within the project footprint, and an additional 57 ac (23 ha) to the south of the project footprint, but still within Unit 1. Thus, we are considering these two parcels in this unit for exclusion under the Coral Reef Commons HCP.

The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from storms.

Unit 2: Deering Estate Complex/Bill Sadowski Park

Unit 2 consists of 291 ac (119 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Miami-Dade County, this unit is fragmented by residential communities, light commercial development, and canals. The Biscayne Bay borders the majority of Unit 2 to the east, with suburban development surrounding the remaining areas. Habitat areas associated with Unit 2 have experienced a relatively stable environment as most are adjacent to neighborhoods or the Biscayne Bay but also have been the focus of land acquisition for conservation. The majority of lands within this unit are conserved and managed by the County as Bill Sadowski Park and Deering Estate. Landowners include the State of Florida, Miami-Dade County, the Deering Estate Foundation (private), and other private entities. The physical or biological features in this unit may require special management to protect

them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from storms.

Unit 3: Barnacle

Unit 3 consists of 5 ac (2 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Miami-Dade County, this unit is surrounded by an established urban matrix on all sides except the Biscayne Bay to the east. The majority of suitable habitat is within the boundaries of the Barnacle Historic State Park, a State of Florida property, and additional habitat is owned by private entities or is of unknown/undefined ownership. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from storms.

Unit 4: Camp Owaissa Bauer

Unit 4 consists of 96 ac (39 ha) and contains all of the essential physical or biological features for the species. Located within Miami-Dade County, agriculture lands and light residential communities surround the unit, and a two-lane road separates the larger north portion from the south portion. The unit is considered unoccupied, as there are no records of rim rock crowned snake observations; however, it contains all physical or biological features, is within the species' historical range, and is located inland, away from projected habitat losses from sea level rise as predicted for the Florida Keys populations. Therefore, Unit 4 would serve as a suitable reestablishment site to increase species redundancy when population losses are expected to occur in the Florida Keys in the future; thus, this area is essential for the conservation of the species. The majority of the unit is owned by Miami-Dade County, and is managed by Miami-Dade County's Environmentally Endangered Lands program. Some small parcels are owned by the State of Florida and private or unknown/undefined entities.

Unit 5: Navy Wells

Unit 5 consists of 325 ac (132 ha) and contains all of the essential physical or biological features for the species. It is located within Miami-Dade County; agriculture lands and light residential development surround the unit. The unit is considered unoccupied, as there are no records of rim rock crowned snake observations; however, it contains all physical or biological features, is within the species' historical range, and

is located inland, away from projected habitat losses from sea level rise as predicted for the Florida Keys populations. Therefore, Unit 5 would serve as a suitable reestablishment site to increase species redundancy when population losses are expected to occur in the Florida Keys in the future; thus, this area is essential for the conservation of the species. The majority of the unit is owned by Miami-Dade County, and the State of Florida owns a large tract of land, both of which are managed by Miami-Dade County's Environmentally Endangered Lands program. Some small parcels are owned by private entities.

Unit 6: North Key Largo

Unit 6 consists of 2,162 ac (875 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. It is located within Monroe County and includes the city of Key Largo of the upper Florida Keys islands. This unit is surrounded by the Atlantic Ocean to the east and the Florida Bay to the west. Habitat consists primarily of contiguous habitat owned by several Federal agencies (National Park Service, Naval Air Station, U.S. Coast Guard, and the Service), in which the Service owns the majority as Crocodile Lake National Wildlife Refuge (Refuge). Other Federal land owners have turned over ownership to the Service (Dixon 2020, pers. comm.), but records may not reflect this yet. Parcels previously owned by the other Federal entities are embedded within the Refuge and have been managed as part of the Refuge. The State of Florida owns and manages Dagny Johnson Key Largo Hammock Botanical Park within this unit. Monroe County, local government, and private entities own additional habitat within this unit. The physical or biological features in this unit may require special management to protect them from development. This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 7: Key Largo

Unit 7 consists of 298 ac (121 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Monroe County and part of the city of Key Largo, of the upper Florida Keys islands, the habitat in this unit is surrounded and/or fragmented by suburban and urban development. The majority of habitat consists of habitat owned by private entities and the State of Florida (John Pennekamp Coral Reef State Park). Smaller portions of habitat are owned by Monroe County. Habitat connectivity among occurrences is lacking within the unit; fragmentation is

from residential and light commercial development, as well as canals and two-lane roads. The physical or biological features in this unit may require special management to protect them from development. This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 8: Tavernier

Unit 8 consists of 181 ac (73 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Monroe County and part of the city of Tavernier, within the upper Florida Keys islands, the habitat in this unit is surrounded and/or fragmented by suburban and urban development, canals, and two-lane roads. The State of Florida (Dove Creek Hammock), county/local government, and private entities own land in this unit. The physical or biological features in this unit may require special management to protect them from development. This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 9: Vaca Key

Unit 9 consists of 59 ac (24 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Monroe County and part of the city of Marathon, within the upper Florida Keys, the habitat in this unit is surrounded and/or fragmented by suburban and urban development. The majority of habitat is owned by private entities, including the Florida Keys Land Trust Inc. Additionally, Monroe County owns an important tract that is within dispersal distance of the land trust property. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 10: Big Pine Key

Unit 10 consists of 1,729 ac (700 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. Located within Monroe County within the lower Florida Keys, the central and southern portions of the unit are surrounded and/or fragmented by residential communities, some light commercial development, and two-lane roads. The northern portion of the unit is primarily rural with some two-lane roads and residential communities scattered throughout. The majority of habitat in this unit is federally owned, specifically

as National Key Deer Wildlife Refuge. Large tracts are also owned by the National Park Service, other Federal ownership, and the State of Florida. Smaller tracts of habitat are owned by Monroe County, local government, and private entities. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Unit 11: Key West

Unit 11 consists of 9 ac (4 ha) and contains all of the essential physical or biological features for the species. This unit is occupied. It is located within Monroe County and part of the city of Key West, within the lower Florida Keys. Large resorts and hotels are located to the east, and the Key West International Airport is located to the south of this unit. The remaining areas around the unit are undeveloped. Unit 11 is owned by Monroe County, local government, and private entities. The physical or biological features in this unit may require special management to protect them from development and fire suppression (in pine rocklands). This unit is also vulnerable to effects from sea level rise, saltwater intrusion, and storms.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

We published a final rule revising the definition of destruction or adverse modification on February 11, 2016 (81 FR 7214) (although we also published a revised definition after that (on August 27, 2019); that 2019 definition was subsequently vacated by the court in *CBD v. Haaland*). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such

alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.

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

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

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

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

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

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

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

(3) Are economically and technologically feasible, and

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

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

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

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

Application of the "Destruction or Adverse Modification" Standard

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

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

Activities that we may, during a consultation under section 7(a)(2) of the Act, consider likely to destroy or adversely modify critical habitat include, but are not limited to: Construction, land development, and agriculture that require clearing, digging, and/or otherwise altering suitable habitat. Clearing of vegetation and digging could remove vegetation cover, leaf litter, woody debris, and limestone substrate, which would contribute to losses of shelter, ability to thermo-regulate, prey, sites for laying and incubating eggs, and conditions for a warm, moist microhabitat. Additionally, development, agriculture, and construction projects can further fragment tracts of suitable habitat, inhibiting dispersal by the Key ring-necked snake and the rim rock crowned snake between remaining areas of suitable habitat, and cause habitat degradation by making it more difficult to conduct prescribed fire in pine rocklands habitat. Furthermore, in areas protected and managed for conservation, prescribed fire and other management activities (mechanical clearing, out-planting, etc.) have the potential to harm individuals; however, the long-term benefits typically far outweigh the potential harm.

Exemptions

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

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DoD), or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a) (Sikes Act), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. No DoD lands with a completed INRMP are within the proposed critical habitat designation for either the Key ring-necked snake or the rim rock crowned snake.

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

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from

designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. Exclusion decisions are governed by the regulations at 50 CFR 424.19 and the Policy Regarding Implementation of Section 4(b)(2) of the Endangered Species Act, 81 FR 7226 (Feb. 11, 2016) (2016 Policy)—both of which were developed jointly with the National Marine Fisheries Service (NMFS). We also refer to a 2008 Department of the Interior Solicitor's opinion entitled "The Secretary's Authority to Exclude Areas from a Critical Habitat Designation under Section 4(b)(2) of the Endangered Species Act" (M-37016). We explain each decision to exclude areas, as well as decisions not to exclude, to demonstrate that the decision is reasonable.

In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise discretion to exclude the area only if such exclusion would not result in the extinction of the species. In making the determination to exclude a particular area, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor. We describe below the process that we undertook for taking into consideration each category of impacts and our analyses of the relevant impacts.

Consideration of Economic Impacts

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a proposed critical habitat designation is analyzed by

comparing scenarios both “with critical habitat” and “without critical habitat.”

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

Executive Orders (E.O.s) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess, to the extent practicable, the probable impacts to both directly and indirectly affected entities. Section 3(f) of E.O. 12866 identifies four criteria when a regulation is considered a “significant” rulemaking, and requires additional analysis, review, and approval if met. The criteria relevant here is whether the designation of critical habitat may have an economic effect of greater than \$100 million in any given year (section 3(f)(1)). Therefore, our consideration of economic impacts uses a screening analysis to assess whether a designation of critical habitat for the Key ring-necked snake or the rim rock crowned snake is likely to exceed the economically significant threshold.

For these particular designations, we developed incremental effects memorandums (IEMs) considering the probable incremental economic impacts

that may result from this proposed designation of critical habitat. The information contained in our IEMs was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the Key ring-necked snake and the rim rock crowned snake (Industrial Economics, Incorporated (IEc) 2021, entire). We began by conducting a screening analysis of the proposed designation of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographic areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (that is, absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. The presence of the listed species in occupied areas of critical habitat means that any destruction or adverse modification of those areas will also likely jeopardize the continued existence of the species. Therefore, designating occupied areas as critical habitat typically causes little if any incremental impacts above and beyond the impacts of listing the species. Accordingly, the screening analysis focuses on areas of unoccupied critical habitat. If the proposed critical habitat designation contains any unoccupied units, the screening analysis assesses whether those units require additional management or conservation efforts that may incur incremental economic impacts. This screening analysis, combined with the information contained in our IEMs, constitute what we consider to be our draft economic analysis (DEA) of the proposed critical habitat designation for the Key ring-necked snake and the rim rock crowned snake; our DEA is summarized in the narrative below.

As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas that may be affected by the critical habitat designation. In our evaluation of the probable incremental

economic impacts that may result from the proposed designation of critical habitat for the Key ring-necked snake and the rim rock crowned snake, first we identified, in the IEM dated April 19, 2021, probable incremental economic impacts associated with the following categories of activities: (1) Land development (commercial and residential); (2) agriculture development; (3) refuge activities (construction related to infrastructure, asphalt road and debris removal, mechanical treatments to support prescribed fire, invasive species removal, out planting, prescribed fire); and (4) recreational activities. We considered each industry or category individually. Additionally, we considered whether their activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat only affects activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the species is present, Federal agencies would be required to consult with the Service under section 7 of the Act on activities they fund, permit, or implement that may affect the species. If, when we list the species, we also finalize the proposed critical habitat designations, our consultation would include an evaluation of measures to avoid the destruction or adverse modification of critical habitat.

In our IEMs, we attempted to clarify the distinction between the effects that would result from the species being listed and those attributable to the critical habitat designation (that is, difference between the jeopardy and adverse modification standards) for the Key ring-necked snake and the rim rock crowned snake’s critical habitat. Because the designations of critical habitat for Key ring-necked snake and the rim rock crowned snake are proposed concurrently with the listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would likely adversely affect the essential physical or biological features of occupied critical habitat are also likely to adversely affect the

species. The IEMs outline our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the Key ring-necked snake totals approximately 2,604 ac (1,054 ha). All units are occupied. The proposed critical habitat for the rim rock crowned snake totals 5,972 ac (2,418 ha). Of the 11 critical habitat units for the rim rock crowned snake, 9 are occupied and 2 are considered unoccupied.

When an action is proposed in an area of designated critical habitat, and the proposed activity has a Federal nexus, the need for consultation is triggered. Any incremental costs associated with consideration of potential effects to the critical habitat are a result of this consultation process. For all occupied areas, the economic costs of critical habitat designations will most likely be limited to additional administrative efforts to consider adverse modification in section 7 consultations, as the listing of both species is happening concurrently with critical habitat designation, and all occupied units would still need to undergo section 7 consultation due to listing regardless of critical habitat designation. While this additional analysis will require time and resources by both the Federal action agency and the Service, it is believed that, in most circumstances, these costs would predominantly be administrative in nature and would not be significant. In total, critical habitat designations for the Key ring-necked snake and the rim rock crowned snake are unlikely to generate costs or benefits exceeding \$100 million in a single year. For the Key ring-necked snake, the analysis predicted that approximately one formal consultation, three informal consultations, and three technical assistance efforts are anticipated to occur annually in proposed critical habitat areas. For the rim rock crowned snake, the analysis predicted that approximately two formal consultations, eight informal consultations, and nine technical assistance efforts are anticipated to occur annually in proposed critical habitat areas (IEc 2021, p. 3). For the Key ring-necked snake, approximately 85 percent of the proposed areas overlap with existing designations for species including Bartram's scrub-hairstreak butterfly (*Strymon acis bartrami*), the Lower

Florida Keys distinct population segment of the rice rat (*Oryzomys palustris natator*), and Florida semaphore cactus (*Consolea corallicola*). For the rim rock crowned snake, approximately 90 percent of the proposed areas overlaps with other designations, including Bartram's scrub-hairstreak butterfly, Florida leafwing butterfly (*Anaea troglodyta floridaalis*), Florida brickell-bush (*Brickellia mosieri*), Carter's small-flowered flax (*Linum carteri* var. *carteri*), and the Florida distinct population segment of the American crocodile (*Crocodylus acutus*).

Overall, we expect that agency administrative costs for consultation, incurred by the Service and the consulting Federal agency, would be minor (less than \$6,000 per consultation effort) and, therefore, would not be significant (IEc 2021, p. 22). The total annual incremental costs of critical habitat designations for the Key ring-necked snake and rim rock crowned snake are anticipated to be less than \$14,400 per year and \$35,200 per year, respectively.

Incremental costs may occur outside of the section 7 consultation process if the designation of critical habitat triggers additional requirements or project modifications under State or local laws, regulations, or management strategies. These types of costs typically occur if the designation increases awareness of the presence of the species or the need for protection of its habitat. Given that both the Key ring-necked snake and the rim rock crowned snake are covered by certain existing Federal and State protections, project proponents may already be aware of the presence of the two species. For example, the rim rock crowned snake is a covered species under the Coral Reef Commons HCP, and both the Key ring-necked snake and rim rock crowned snake are listed as "State-designated Threatened" on Florida's Endangered and Threatened Species list. The species are further protected through habitat management and conservation under Florida's Imperiled Species Management Plan, the Florida Keys Wildlife and Environmental Area Management Plan, Monroe County Year 2030 Comprehensive Plan, and the National Key Deer Wildlife Refuge. Therefore, designating critical habitat is unlikely to provide information to State or local agencies that would result in new regulations or actions (IEc 2021, pp. 20–21).

With regard to the two unoccupied units for the rim rock crowned snake, additional costs are unlikely because the proposed units substantially overlap

with critical habitat designations for other species (over 95 percent total overlap for each unit). In these areas, consultations for listed species and designated critical habitat are likely to have already resulted in protections for habitat suitable for the rim rock crowned snake even absent listing or critical habitat designation.

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

Consideration of National Security Impacts

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

However, we cannot automatically exclude requested areas. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland-

security impacts, it must provide a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border-security patrols and surveillance activities, or a delay in training or facility construction, as a result of compliance with section 7(a)(2) of the Act. If the agency requesting the exclusion does not provide us with a reasonably specific justification, we will contact the agency to recommend that it provide a specific justification or clarification of its concerns relative to the probable incremental impact that could result from the designation. If we conduct an exclusion analysis because the agency provides a reasonably specific justification or because we decide to exercise the discretion to conduct an exclusion analysis, we will defer to the expert judgment of DoD, DHS, or another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or waters, have national-security or homeland-security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary section 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

In preparing this proposal, we have determined that the lands within the proposed designation of critical habitat for the Key ring-necked snake are not owned or managed by the DoD or DHS, and, therefore, we anticipate no impact on national security or homeland security. For the rim rock crowned snake, as mentioned above, approximately 80 ac (32 ha) of the U.S. Coast Guard property is proposed for designation as critical habitat in the Richmond Pine Rocklands unit (Unit 1). This U.S. Coast Guard property is separated into two main areas: the Communication Station (COMMSTA) Miami and the Civil Engineering Unit (CEU). The COMMSTA houses transmitting and receiving antennas. The CEU plans and executes projects at regional shore facilities, such as construction and post-disaster assessments.

The U.S. Coast Guard parcel contains approximately 80 ac (32 ha) of pine rocklands. The U.S. Coast Guard parcel has a draft management plan that includes management of pine rockland

habitats, including vegetation control and prescribed fire and protection of lands from further development or degradation. In addition, the standing pine rockland area is partially managed through an active recovery grant to the Institute for Regional Conservation. Under this grant, up to 39 ac (16 ha) of standing pine rocklands will undergo invasive vegetation control.

Based on a review of the specific mission of the U.S. Coast Guard facility in conjunction with the measures and efforts set forth in the draft management plan to preserve pine rockland habitat and protect sensitive and listed species, we have determined that it is unlikely that the critical habitat, if finalized as proposed, would negatively impact the facility or its operations. As a result, we do not anticipate any impact on national security.

However, if through the public comment period we receive information regarding impacts on national security or homeland security from designating particular areas as critical habitat, then as part of developing the final designation of critical habitat, we will conduct a discretionary exclusion analysis to determine whether to exclude those areas under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19.

Consideration of Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security discussed above. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are permitted conservation plans covering the species in the area—such as HCPs, safe harbor agreements (SHAs), or candidate conservation agreements with assurances (CCAAs)—or whether there are non-permitted conservation agreements and partnerships that may be impaired by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designation. We also consider any State, local, social, or other impacts that might occur because of the designation.

For the Key ring-necked snake, we have not identified any areas to consider for exclusion from critical habitat. In preparing this proposal, we have determined that there are currently no management plans for the Key ring-

necked snake, and no HCPs where the Key ring-necked snake is a covered species. Additionally, the proposed designation does not include any Tribal lands or trust resources. Therefore, we anticipate no impact on Tribal lands, partnerships, or HCPs from this proposed critical habitat designation. However, during the development of a final designation, we will consider any information currently available or received during the public comment period. If we evaluate information regarding a request for an exclusion and we do not exclude, we will fully describe our rationale for not excluding in the final critical habitat determination.

For the rim rock crowned snake, we are considering a portion of one unit (Unit 1: Richmond Pine Rocklands) for exclusion due to other relevant impacts because of the presence of an HCP that includes the rim rock crowned snake as a covered species. When analyzing other relevant impacts of including a particular area in a designation of critical habitat, we weigh those impacts relative to the conservation value of the particular area. To determine the conservation value of designating a particular area, we consider a number of factors, including, but not limited to, the additional regulatory benefits that the area would receive due to the protection from destruction or adverse modification as a result of actions with a Federal nexus, the educational benefits of mapping essential habitat for recovery of the listed species, and any benefits that may result from a designation due to State or Federal laws that may apply to critical habitat.

In the case of the rim rock crowned snake, the benefits of critical habitat include public awareness of the presence of the rim rock crowned snake and the importance of habitat protection, and, where a Federal nexus exists, increased habitat protection for the rim rock crowned snake due to protection from destruction or adverse modification of critical habitat. Continued implementation of an ongoing management plan that provides conservation equal to or more than the protections that result from a critical habitat designation would reduce those benefits of including that specific area in the critical habitat designation.

We evaluate the existence of a conservation plan when considering the benefits of inclusion. We consider a variety of factors, including, but not limited to, whether the plan is finalized; how it provides for the conservation of the essential physical or biological features; whether there is a reasonable expectation that the conservation

management strategies and actions contained in a management plan will be implemented into the future; whether the conservation strategies in the plan are likely to be effective; and whether the plan contains a monitoring program or adaptive management to ensure that the conservation measures are effective and can be adapted in the future in response to new information.

After identifying the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to evaluate whether the benefits of exclusion outweigh those of inclusion. If our analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, we then determine whether exclusion would result in extinction of the species. If exclusion of an area from critical habitat will result in extinction, we will not exclude it from the designation.

Private or Other Non-Federal Conservation Plans Related to Permits Under Section 10 of the Act

HCPs for incidental take permits under section 10(a)(1)(B) of the Act provide for partnerships with non-Federal entities to minimize and mitigate impacts to listed species and their habitats. In some cases, HCP permittees agree to do more for the conservation of the species and their habitats on private lands than designation of critical habitat would provide alone. We place great value on the partnerships that are developed during the preparation and implementation of HCPs.

CCAAs and SHAs are voluntary agreements designed to conserve candidate and listed species, respectively, on non-Federal lands. In exchange for actions that contribute to the conservation of species on non-Federal lands, participating property owners are covered by an “enhancement of survival” permit under section 10(a)(1)(A) of the Act, which authorizes incidental take of the covered species that may result from implementation of conservation actions, specific land uses, and, in the case of SHAs, the option to return to a baseline condition under the agreements. We also provide enrollees assurances that we will not impose further land-, water-, or resource-use restrictions, or require additional commitments of land, water, or finances, beyond those agreed to in the agreements.

When we undertake a discretionary section 4(b)(2) exclusion analysis based on permitted conservation plans (such as CCAAs, SHAs, and HCPs), we anticipate consistently excluding such areas if incidental take caused by the

activities in those areas is covered by the permit under section 10 of the Act and the CCAA/SHA/HCP meets all of the following three factors (see the 2016 Policy for additional details):

(a) The permittee is properly implementing the CCAA/SHA/HCP and is expected to continue to do so for the term of the agreement. A CCAA/SHA/HCP is properly implemented if the permittee is and has been fully implementing the commitments and provisions in the CCAA/SHA/HCP, Implementing Agreement, and permit.

(b) The species for which critical habitat is being designated is a covered species in the CCAA/SHA/HCP, or very similar in its habitat requirements to a covered species. The recognition that the Services extend to such an agreement depends on the degree to which the conservation measures undertaken in the CCAA/SHA/HCP would also protect the habitat features of the similar species.

(c) The CCAA/SHA/HCP specifically addresses that species’ habitat and meets the conservation needs of the species in the planning area.

The proposed critical habitat designation includes areas that are covered by the following permitted plan providing for the conservation of the rim rock crowned snake: the Coral Reef Commons HCP.

Coral Reef Commons Habitat Conservation Plan—In preparing this proposal, we have determined that lands associated with the Coral Reef Commons HCP within the Richmond Pine Rocklands unit (Unit 1) are included within the boundaries of the proposed critical habitat.

Coral Reef Commons is a mixed-use community, which consists of 900 apartments, retail stores, restaurants, and parking. In 2017, an HCP and associated permit under section 10 of the Act was developed and issued for the Coral Reef Commons development. As part of the HCP and permit, an approximately 53-ac (21-ha) on-site preserve (same as the area for proposed critical habitat designation) was established under a conservation encumbrance that will be managed in perpetuity for pine rocklands habitat and sensitive and listed species, including the rim rock crowned snake. An additional pine rocklands area of approximately 57 ac (23 ha) on the University of Miami’s Center for Southeastern Tropical Advanced Remote Sensing site is an off-site mitigation area for Coral Reef Commons. Both the on-site preserve and the off-site mitigation area are being managed to maintain healthy pine rocklands habitat through the use of invasive, exotic plant

management; mechanical treatment; and prescribed fire. Since initiating the Coral Reef Commons HCP, pine rocklands restoration efforts have been conducted within all of the management units in both the on-site preserves and the off-site mitigation area. A second round of prescribed fire began in February 2021. Currently, the on-site preserves meet or exceed the success criteria described in the HCP.

Critical habitat within Unit 1 that is associated with the Coral Reef Commons HCP is limited to the on-site preserves and off-site mitigation area. Based on our review of the HCP and proposed critical habitat for the rim rock crowned snake, we do not anticipate needing any additional conservation measures for the species beyond those that are currently in place. Therefore, we are considering excluding those specific lands associated with the Coral Reef Commons HCP that are in the preserve and off-site mitigation area from the final designation of critical habitat for the rim rock crowned snake. After consideration of public comment on this issue, we will analyze in the final rule whether the benefits of excluding the lands described above from the final designation of critical habitat for the rim rock crowned snake outweigh the benefits of designating those lands as critical habitat. Based on that analysis, the Secretary may exercise her discretion to exclude the lands from the final designation.

Summary of Exclusions Considered Under 4(b)(2) of the Act

For the Key ring-necked snake, we are not considering at this time any exclusions from the proposed designation based on economic impacts, national security impacts, or other relevant impacts—such as partnerships, management, or protection afforded by cooperative management efforts—under section 4(b)(2) of the Act. However, in this proposed rule, we seek information from the public with respect to whether there are any areas that should be considered for exclusion from the critical habitat designation. (Please see **ADDRESSES** for instructions on how to submit comments).

We are considering whether to exclude the following areas under section 4(b)(2) of the Act from the final critical habitat designation for the rim rock crowned snake: a portion of Unit 1 (Richmond Pine Rocklands) covered by the Coral Reef Commons HCP (102 ac (41.3 ha)), which includes onsite preserves and offsite mitigation areas.

In conclusion, for the rim rock crowned snake, we are considering exclusions based on other relevant

impacts. We specifically solicit comments on the inclusion or exclusion of such areas. During the development of a final designation, we will consider any information currently available or received during the public comment period regarding other relevant impacts of the proposed designation and will determine whether these or any other specific areas should be excluded from the final critical habitat designation under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19, and the 2016 Policy.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Regulatory Planning and Review (Executive Orders 12866 and 13563)

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

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The Executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based

on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this proposed rule in a manner consistent with these requirements.

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

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

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine whether potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term "significant economic impact" is meant to apply to a typical small business firm's business operations.

Under the RFA, as amended, and as understood in light of recent court decisions, Federal agencies are required to evaluate the potential incremental impacts of rulemaking on those entities

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

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

Energy Supply, Distribution, or Use— *Executive Order 13211*

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. In our economic analysis, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use, as there are no energy facilities within the boundaries of the proposed critical habitat units for either the Key ring-necked snake or the rim rock crowned snake. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

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

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

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

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of

critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

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

Takings—Executive Order 12630

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for the Key ring-necked snake and the rim rock crowned snake in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed for the proposed designation of critical habitat for the Key ring-necked snake and the rim rock crowned snake, and it concludes that, if adopted, this designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A federalism summary impact statement

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

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

Civil Justice Reform—Executive Order 12988

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule would not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the order. We have proposed designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this proposed rule identifies the physical or biological features essential to the conservation of the species. The proposed areas of critical habitat are

presented on maps, and the proposed rule provides several options for the interested public to obtain more detailed location information, if desired.

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

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

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

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Government-to-Government Relationship With Tribes

In accordance with the President’s memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior’s manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have determined that no Tribal lands fall within the boundaries of the proposed critical habitat for the Key ring-necked snake or the rim rock crowned snake, so no Tribal lands would be affected by the proposed designation.

References Cited

A complete list of references cited in this rulemaking is available on the internet at <https://www.regulations.gov> and upon request from the Florida

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

Authors

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

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. In § 17.11, amend paragraph (h) by adding entries to the List of Endangered and Threatened Wildlife for “Snake, Key ring-necked” and “Snake, rim rock crowned” in alphabetical order under REPTILES to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
Reptiles				
Snake, Key ring-necked	<i>Diadophis punctatus acricus</i> .	Wherever found	E	[Federal Register citation when published as a final rule]; 50 CFR 17.95(c). ^{CH}
Snake, rim rock crowned	<i>Tantilla oolitica</i>	Wherever found	E	[Federal Register citation when published as a final rule]; 50 CFR 17.95(c). ^{CH}

■ 3. In § 17.95, amend paragraph (c) by:
 ■ a. Adding an entry for “Key Ring-necked Snake (*Diadophis punctatus acricus*)” immediately following the entry for “New Mexican Ridge-Nosed Rattlesnake (*Crotalus willardi obscurus*)”; and
 ■ b. Adding an entry for “Rim Rock Crowned Snake (*Tantilla oolitica*)”

immediately following the entry for “Key Ring-necked Snake (*Diadophis punctatus acricus*)”.

The additions read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *
 (c) *Reptiles*.
 * * * * *

Key Ring-Necked Snake (*Diadophis punctatus acricus*)

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

(2) Within these areas, the physical or biological features essential to the conservation of the Key ring-necked

snake consist of the following components:

(i) Pine rocklands habitat that contains:

(A) Refugia consisting of a limestone rock substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;

(B) Suitable prey;

(C) Warm, moist microhabitats to maintain homeostasis; and

(D) A natural or prescribed fire regime at 5- to 7-year intervals that maintains the pine rocklands habitat and associated plant community.

(ii) Rockland hammock habitat that contains:

(A) Refugia consisting of a limestone substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;

(B) Suitable prey;

(C) Warm, moist microhabitat to maintain homeostasis; and

(D) Little or no fire maintenance.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [EFFECTIVE DATE OF THE FINAL RULE].

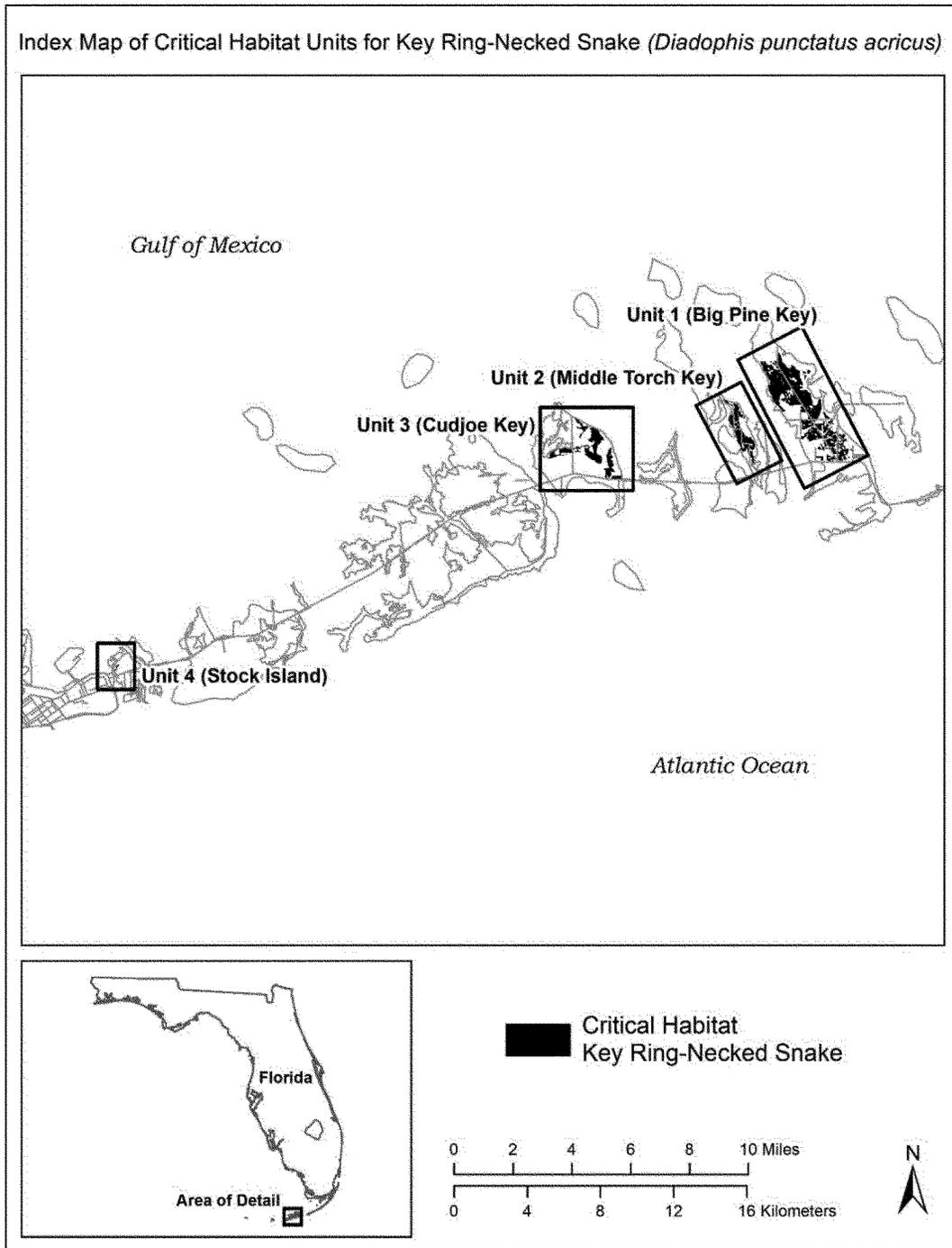
(4) Data layers defining map units were created using ESRI ArcGIS mapping software along with various spatial data layers. ArcGIS was also used to calculate the size of habitat areas. The projection used in mapping and calculating distances and locations within the units was Albers Conical Equal Area (Florida Geographic Data Library), North American Datum of 1983 (NAD 1983) High Accuracy Reference

Network (HARN). The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site at <https://www.fws.gov/office/florida-ecological-services>, at <https://www.regulations.gov> at Docket No. FWS-R4-ES-2022-0022, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map follows:

Figure 1 to Key Ring-necked Snake (*Diadophis punctatus acricus*) paragraph (5)

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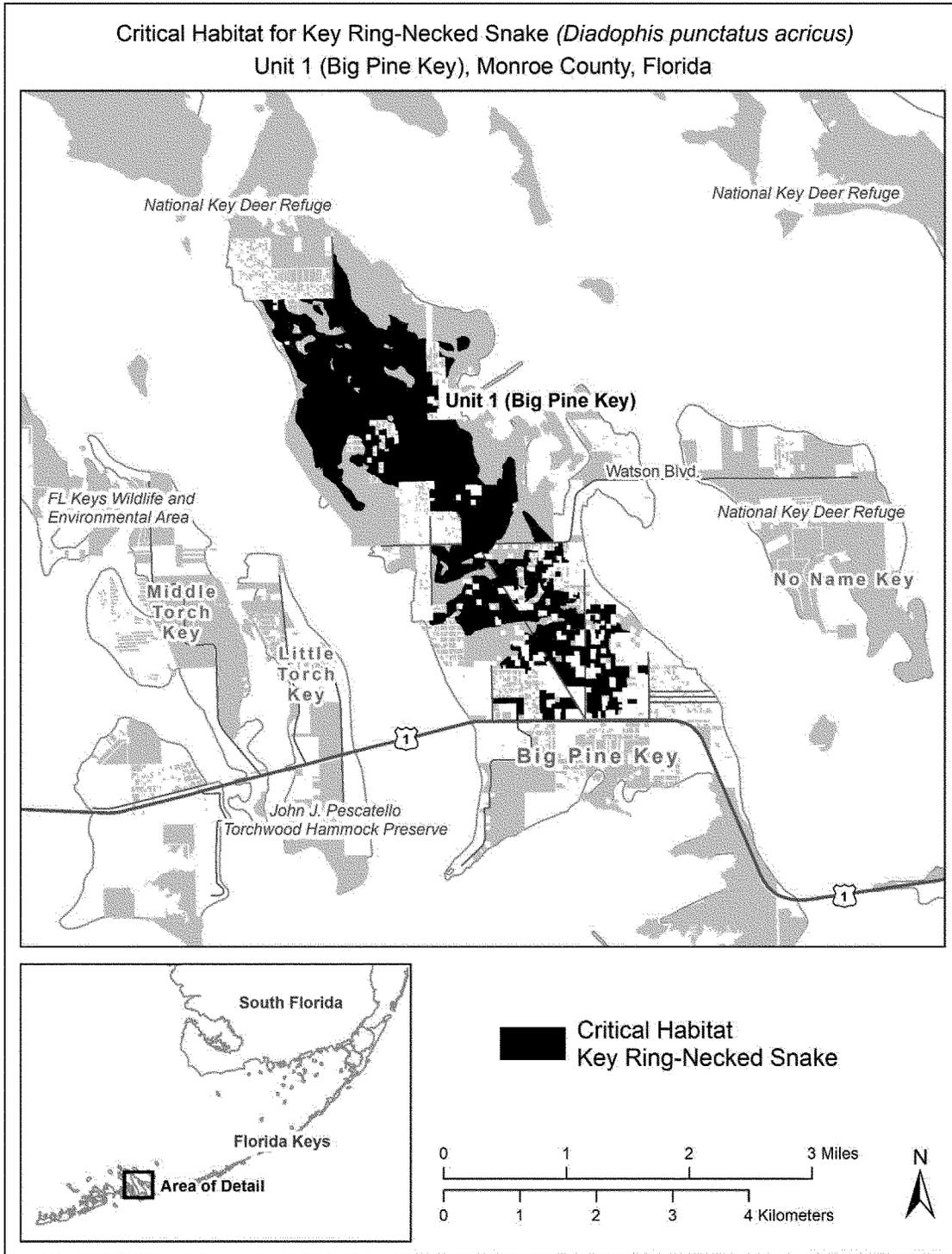
(6) Unit 1: Big Pine Key, Monroe County, Florida.

(i) Unit 1 encompasses 1,734 acres (ac) (702 hectares (ha)) north of U.S. 1 within Monroe County, within the lower Florida Keys. The majority of habitat in this unit (1,174 ac (475 ha))

is owned and managed by the Service and associated with the National Key Deer Wildlife Refuge and by the National Park Service; other large tracts are owned by the State of Florida (366 ac (148 ha)). Smaller tracts of habitat are owned by Monroe County, local

government, and private entities (194 ac (79 ha)).

(ii) Map of Unit 1 follows: Figure 2 to Key Ring-necked Snake (*Diadophis punctatus acricus*) paragraph (6)(ii)

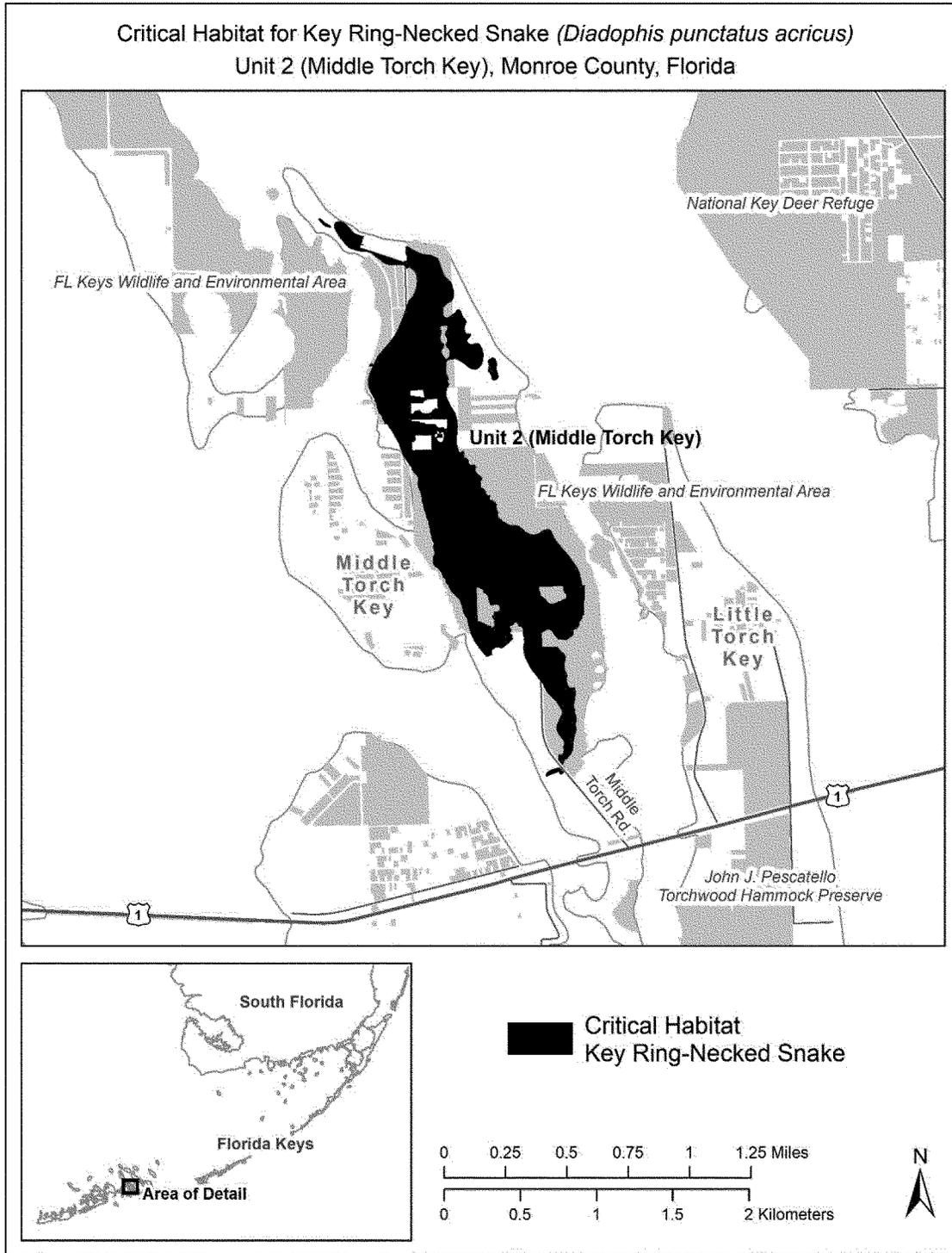


(7) Unit 2: Middle Torch Key, Monroe County, Florida.

(i) Unit 2 encompasses approximately 356 ac (144 ha) north of U.S. 1 and east and west of Middle Torch Road within

Monroe County. The State owns a significant portion of the habitat (211 ac (85 ha)), and a smaller portion is owned by both Federal (59 ac (24 ha)) and private entities (86 ac (35 ha)).

(ii) Map of Unit 2 follows: Figure 3 to Key Ring-necked Snake (*Diadophis punctatus acricus*) paragraph(7)(ii)



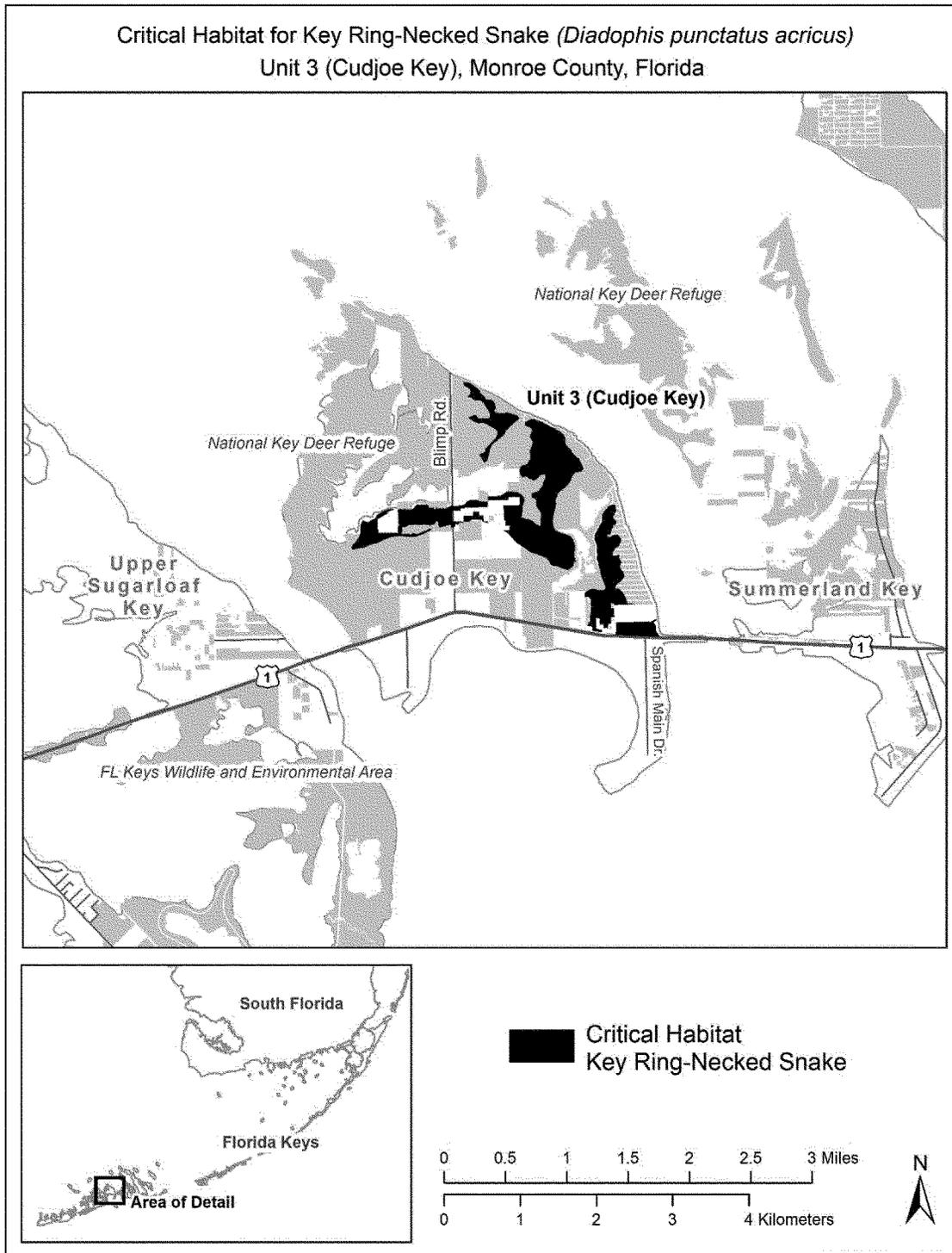
(8) Unit 3: Cudjoe Key, Monroe County, Florida.

(i) Unit 3 encompasses five subunits that total approximately 507 ac (205 ha) north of U.S. 1 and east and west of Blimp Road within Monroe County. The

majority of the habitat in this unit is owned and managed by the Service and associated with the National Key Deer Wildlife Refuge (332 ac (134 ha)). The remainder of the unit is owned by State,

local, and private entities (175 ac (71 ha)).

(ii) Map of Unit 3 follows: Figure 4 to Key Ring-necked Snake (*Diadophis punctatus acricus*) paragraph (8)(ii)

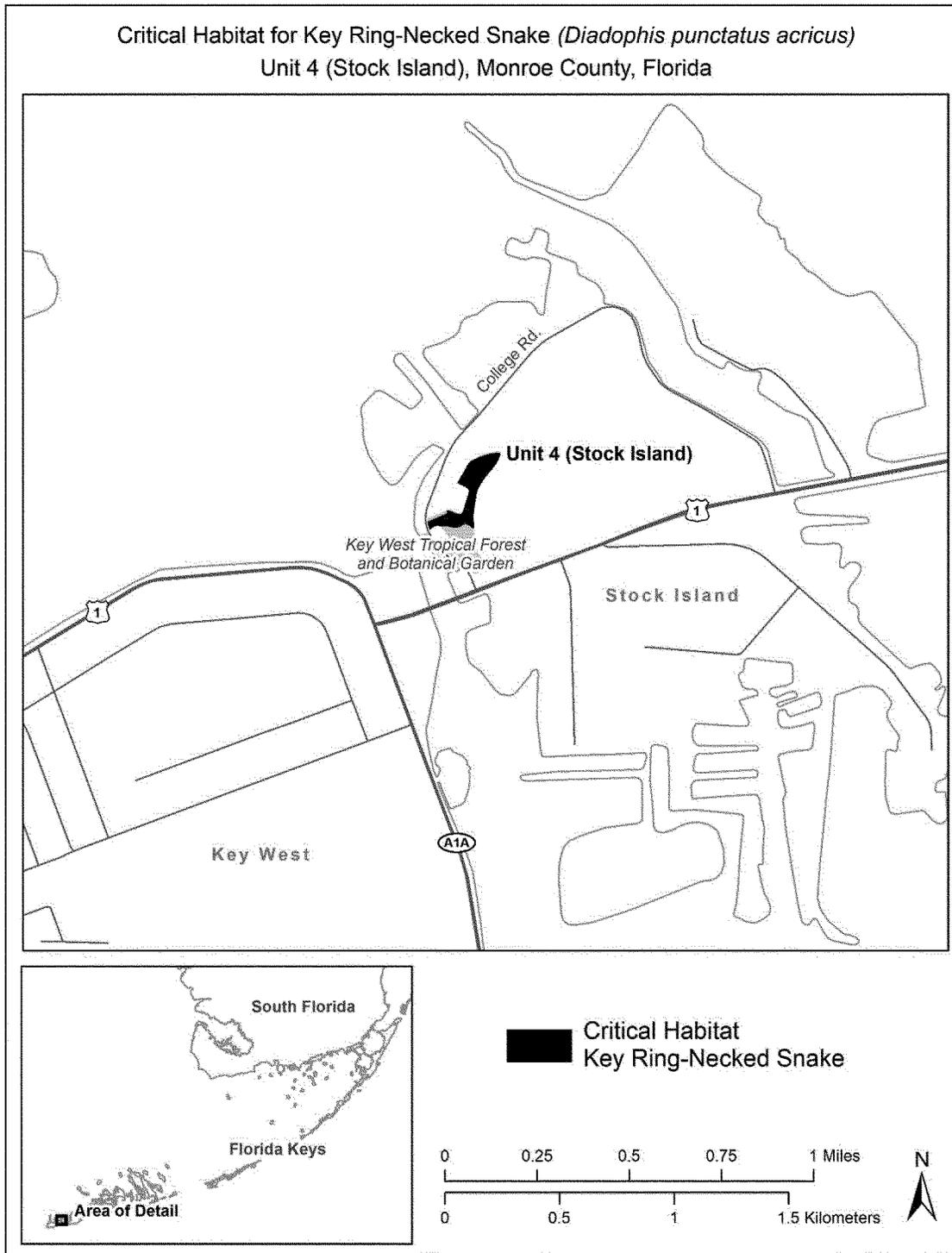


(9) Unit 4: Stock Island, Monroe County, Florida.

(i) Unit 4 encompasses approximately 8 ac (3 ha) north of U.S. 1 and east of

College Road within Monroe County, within the lower Florida Keys. Nearly all habitat in this unit is owned by the City of Key West.

(ii) Map of Unit 4 follows: Figure 5 to Key Ring-necked Snake (*Diadophis punctatus acricus*) paragraph (9)(ii)



Rim Rock Crowned Snake (*Tantilla oolitic*)

(1) Critical habitat units are depicted for Miami-Dade and Monroe Counties, Florida, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the rim rock crowned snake consist of the following components:

(i) Pine rocklands habitat that contains:

(A) Refugia consisting of a limestone rock substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;

(B) Suitable prey;

(C) Warm, moist microhabitats to maintain homeostasis; and

(D) A natural or prescribed fire regime at 5- to 7-year intervals that maintains the pine rocklands habitat and associated plant community.

(ii) Rockland hammock habitat that contains:

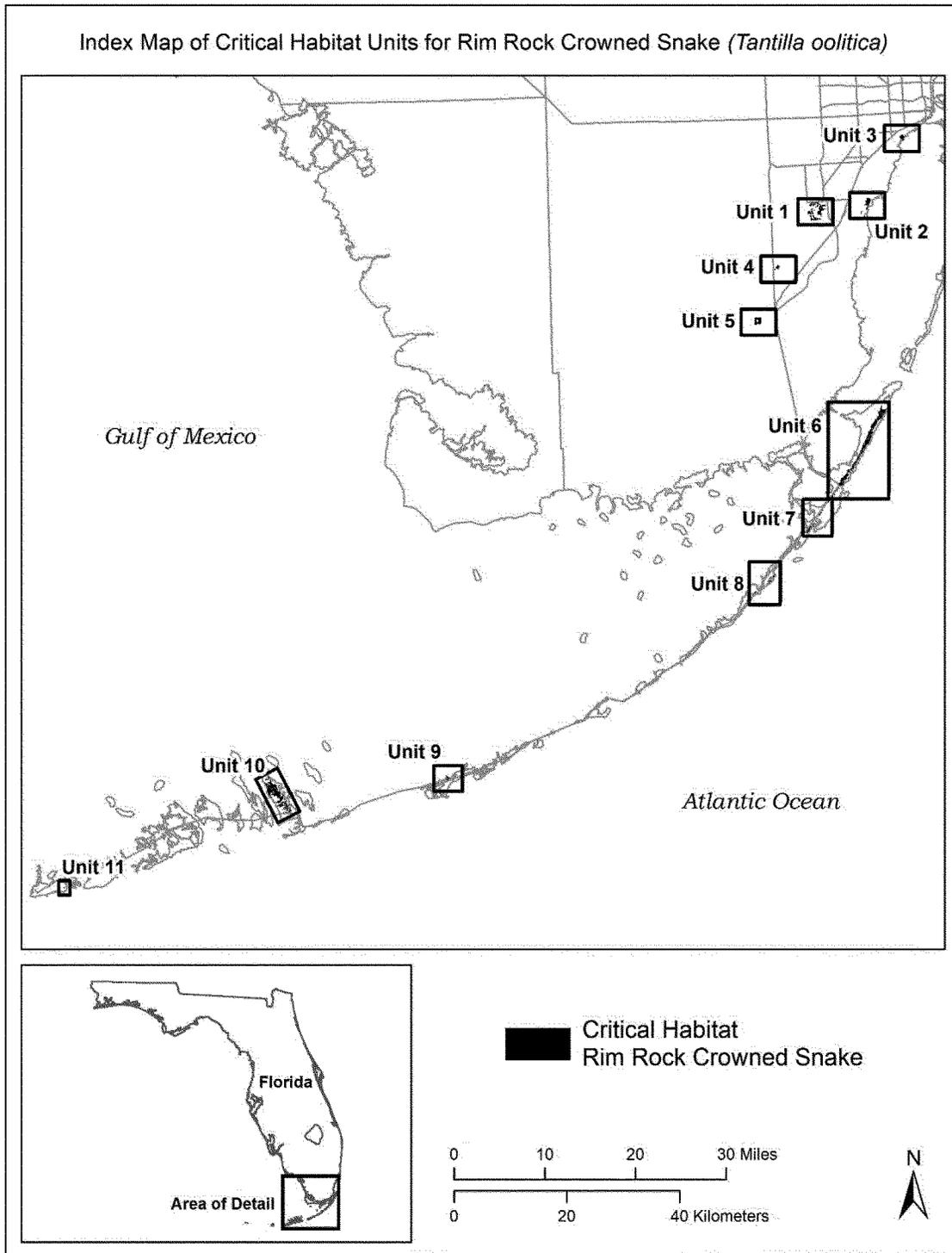
(A) Refugia consisting of a limestone substrate with holes, crevices, and shallow depressions; piles of rock rubble; and pockets of organic matter accumulating in solution holes;

(B) Suitable prey;
(C) Warm, moist microhabitat to maintain homeostasis; and
(D) Little or no fire maintenance.
(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [EFFECTIVE DATE OF THE FINAL RULE].
(4) Data layers defining map units were created using ESRI ArcGIS mapping software along with various

spatial data layers. ArcGIS was also used to calculate the size of habitat areas. The projection used in mapping and calculating distances and locations within the units was Albers Conical Equal Area (Florida Geographic Data Library), NAD 1983 HARN. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the

Service's internet site at <https://www.fws.gov/office/florida-ecological-services>, at <https://www.regulations.gov> at Docket No. FWS-R4-ES-2022-0022, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map follows:
Figure 1 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (5)



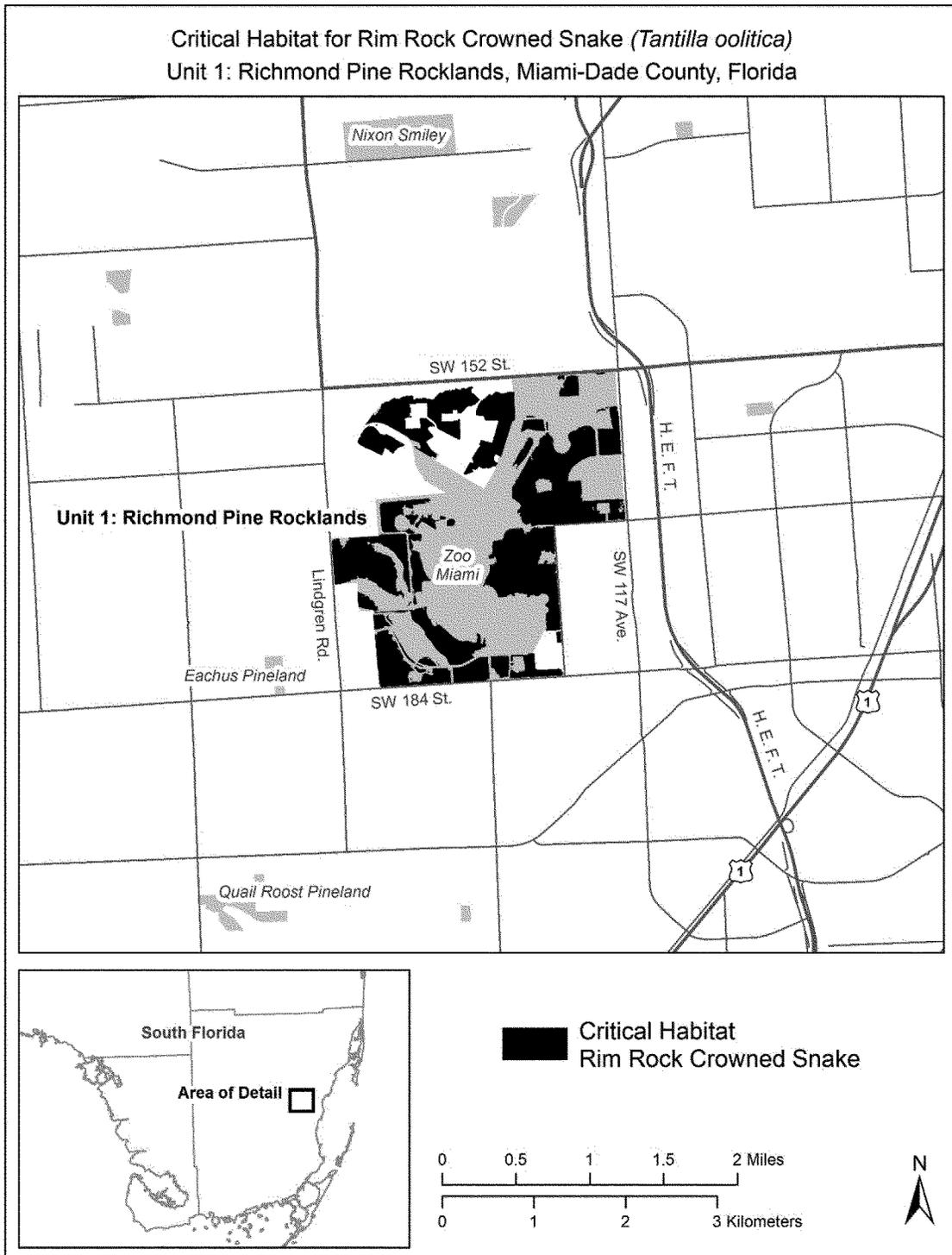
(6) Unit 1: Richmond Pine Rocklands, Miami-Dade County, Florida.

(i) Unit 1 consists of 819 acres (ac) (331 hectares (ha)) in Miami-Dade County. It is composed of 160 ac (65 ha) of Federal land and 659 ac (267 ha) of

County and private lands. This unit is bordered on the north by SW 152 Street (Coral Reef Drive), on the south by SW 200 St (Quail Drive/SR 994), on the east by U.S. 1 (South Dixie Highway), and on

the west by SW 177 Avenue (Krome Avenue).

(ii) Map of Unit 1 follows: Figure 2 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (6)(ii)



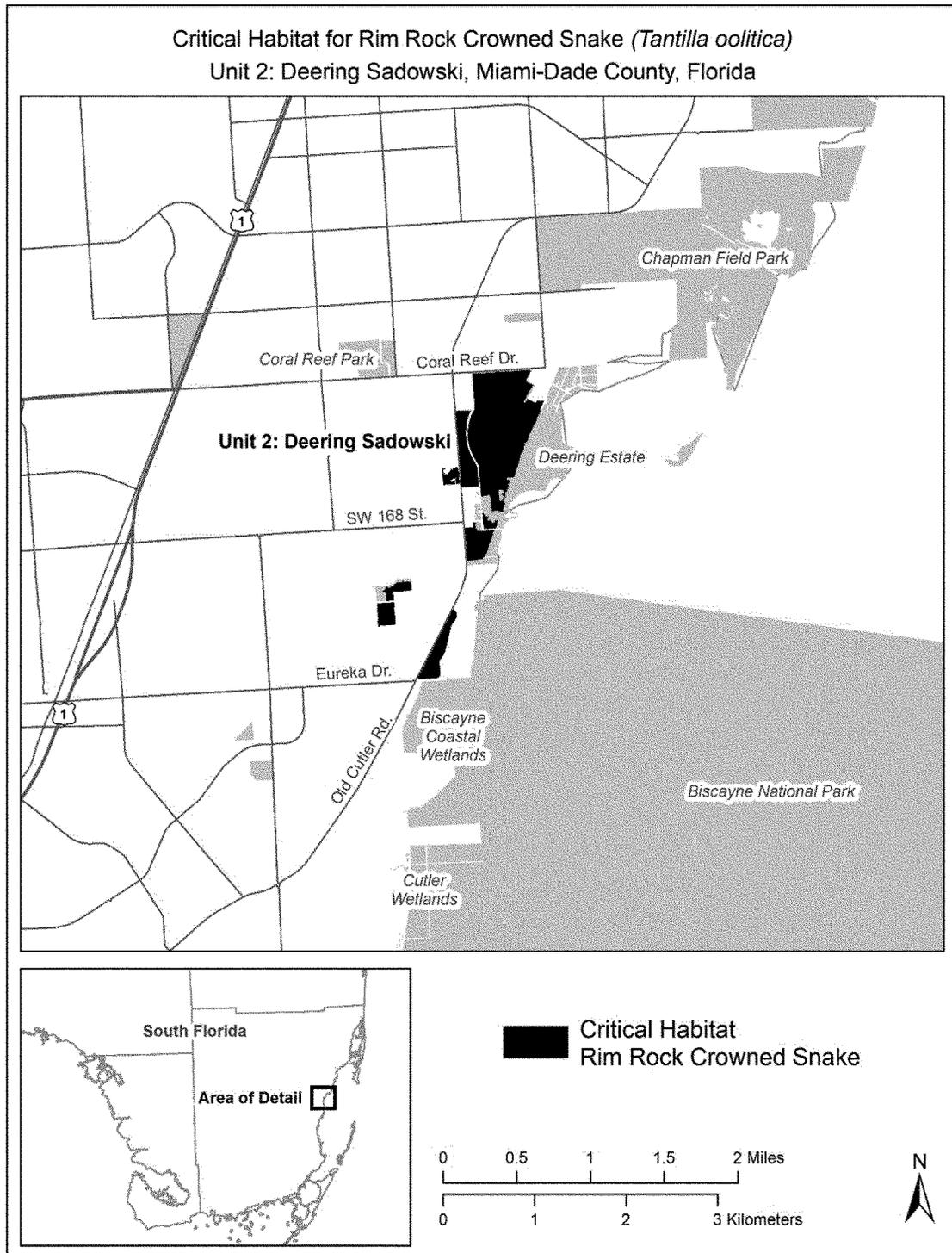
(7) Unit 2: Deering Estate Complex/ Bill Sadowski Park, Miami-Dade County, Florida.

(i) Unit 2 consists of 293 ac (119 ha) in Miami-Dade County, including 241 ac (98 ha) of State land, 19 ac (8 ha) of County owned lands, and 31 ac (12 ha) of private lands. The majority of lands within this unit are conserved and managed by the County as Bill Sadowski Park and Deering Estate. The

majority of the unit is bordered on the north by Coral Reef Drive, on the west by Old Cutler Road, to the south by Eureka Drive, and to the east by unsuitable habitat within the Deering Estate, which is further bordered by the Biscayne Bay. A small parcel of the Deering Estate included in Unit 2 is located west of Old Cutler Road, and is bordered on the east by SW 7th Avenue and by residential property on the north

and south. Bill Sadowski Park, an outparcel of Unit 2, is bordered by Cutler Drain (Canal C-100) on the north, SW 79th Avenue on the west, SW 78th Avenue on the east, and SW 178th Terrace on the south.

(ii) Map of Unit 2 follows: Figure 3 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (7)(ii)



(8) Unit 3: Barnacle, Miami-Dade County, Florida.

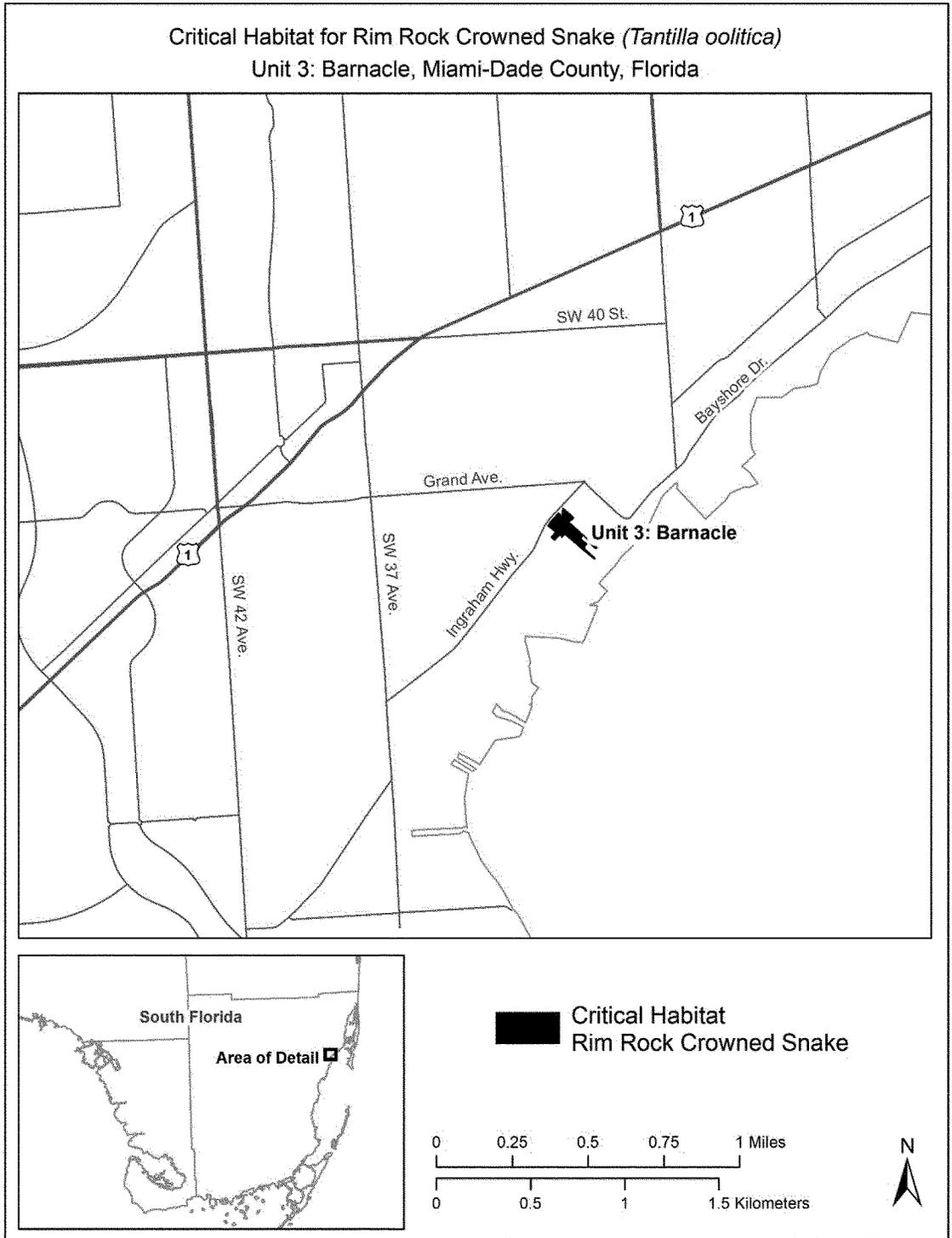
(i) Unit 3 consists of 6 ac (2 ha) in Miami-Dade County, including 3 ac (1 ha) of State land. The remaining acres are local or private ownership. The

majority of the unit is within the boundaries of the Barnacle Historic State Park. This unit is bordered by Main Highway on the northwest, Via Abitare Way on the southwest, an unnamed residential road on the

northeast, and the Biscayne Bay on the southeast.

(ii) Map of Unit 3 follows:

Figure 4 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (8)(ii)



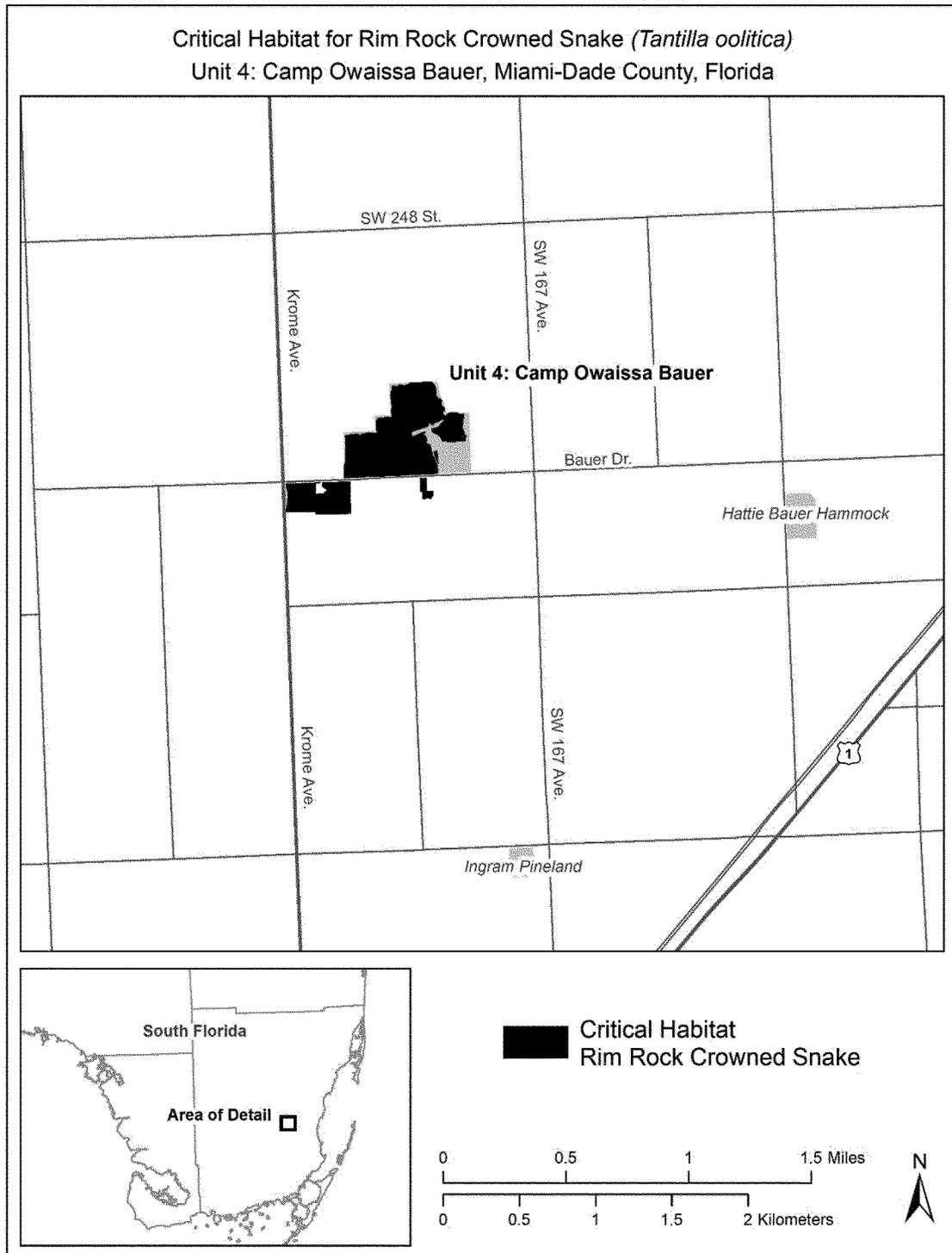
(9) Unit 4: Camp Owaissa Bauer, Miami-Dade County, Florida.

(i) Unit 4 consists of 96 ac (39 ha) in Miami-Dade County, with 9 ac (4 ha) of State land, 83 ac (34 ha) of County owned lands, and 4 ac (2 ha) of private

lands. The majority of the unit is owned by Miami-Dade County and is managed by Miami-Dade County's Environmentally Endangered Lands program. The unit is bordered by State

Road 997 on the west and SW 167th Avenue on the east.

(ii) Map of Unit 4 follows: Figure 5 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (9)(i)



(10) Unit 5: Navy Wells, Miami-Dade County, Florida.

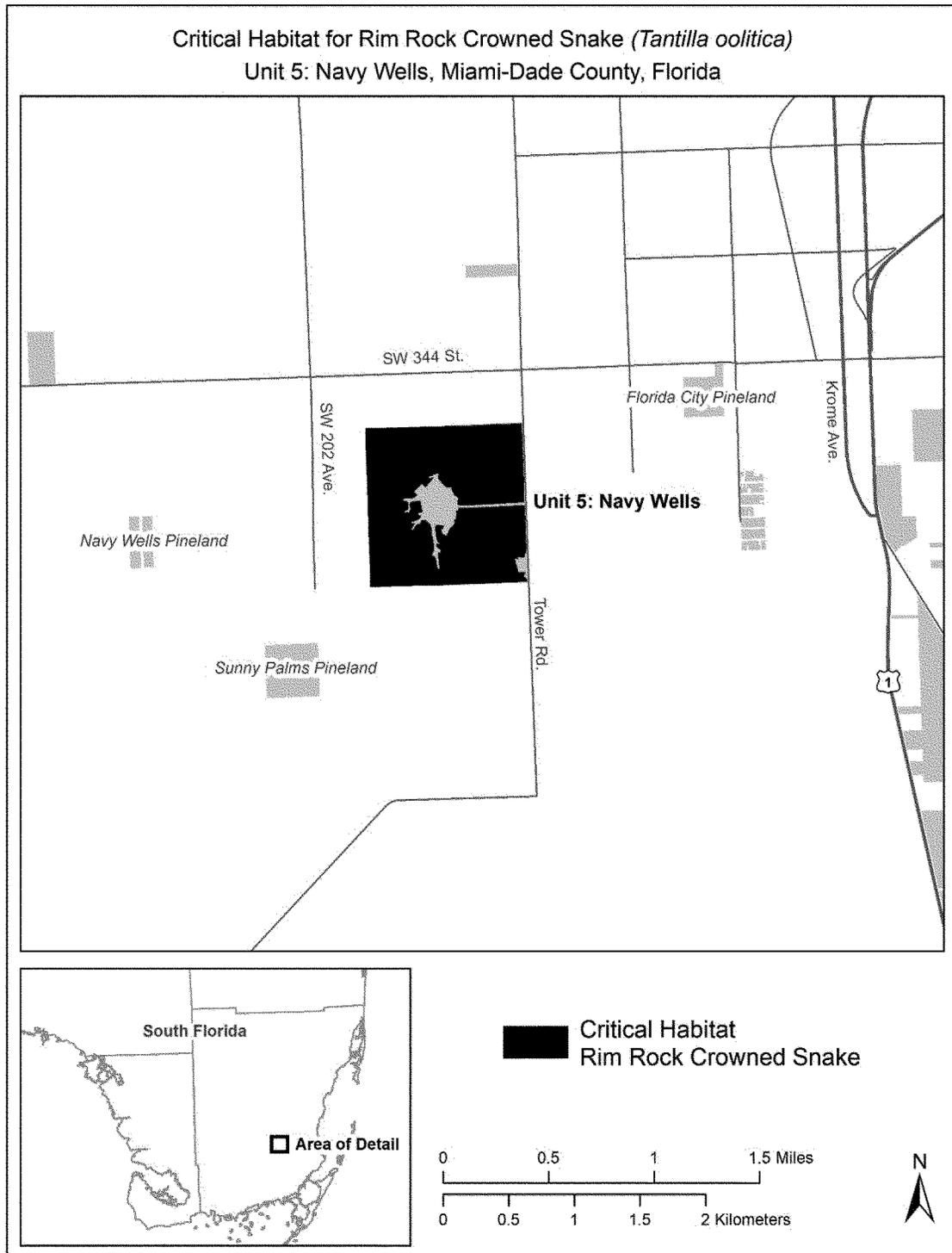
(i) Unit 5 consists of 326 ac (132 ha) in Miami-Dade County. It includes 85 ac (34 ha) of State lands and 240 ac (97 ha) of County owned land. The unit is

bordered by State Road 9336 on the east, and Lucille Drive (SW 360th Street) on the south. The majority of the unit is owned by Miami-Dade County, and the State of Florida owns a large tract of land, both of which are managed by

Miami-Dade County's Environmentally Endangered Lands program.

(ii) Map of Unit 5 follows:

Figure 6 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (10)(ii)

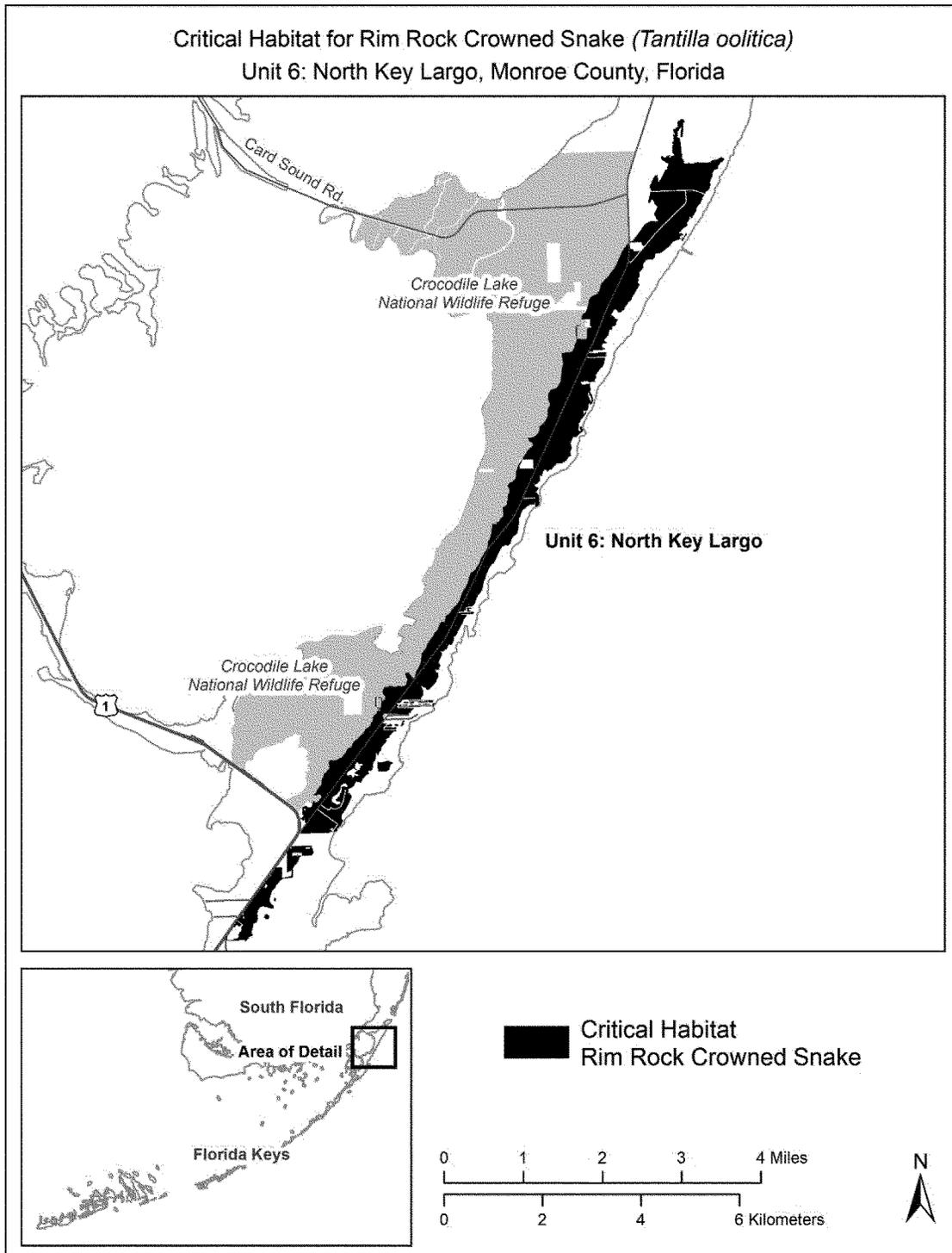


(11) Unit 6: North Key Largo, Monroe County, Florida.
 (i) Unit 6 consists of 2,161 ac (875 ha) in Monroe County, Florida, in the upper Florida Keys. This unit is surrounded by the Atlantic Ocean to the east and the Florida Bay to the west. The unit is bisected by County Road 905 and U.S.

Highway 1, which runs in a northeast to southwest direction in the center of North Key Largo south to Key Largo. It consists of 601 ac (243 ha) of Federal lands, 1,484 ac (601 ha) of State lands, 24 ac (9 ha) of locally owned lands, and 53 ac (21 ha) of private lands. The majority of Federal land in this unit is

owned and managed by the Service and associated with Crocodile Lake National Wildlife Refuge.

(ii) Map of Unit 6 follows: Figure 7 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (11)(ii)



(12) Unit 7: Key Largo, Monroe County, Florida.

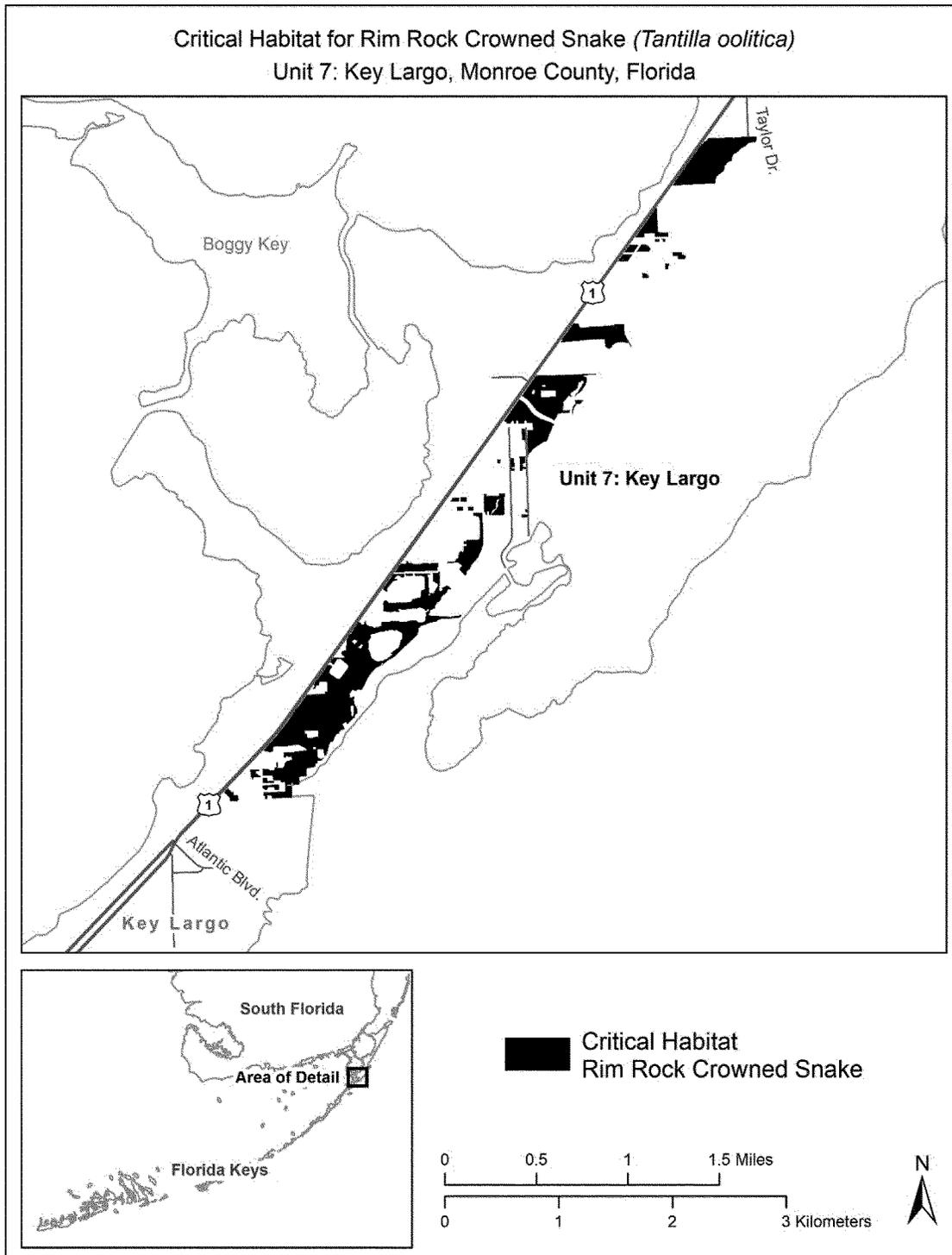
(i) Unit 7 consists of 298 ac (121 ha) in Monroe County, Florida, in the upper Florida Keys. This unit is bordered by U.S. Highway 1 on the northwest. It

consists of 151 ac (40 ha) of State lands, 56 ac (23 ha) of County/local government owned lands, and 91 ac (37 ha) of private lands. The majority of habitat consists of habitat owned by

private entities and the State of Florida (John Pennekamp Coral Reef State Park).

(ii) Map of Unit 7 follows:

Figure 8 to Rim Rock Crowned Snake (*Tantilla oolitic*) paragraph (12)(ii)



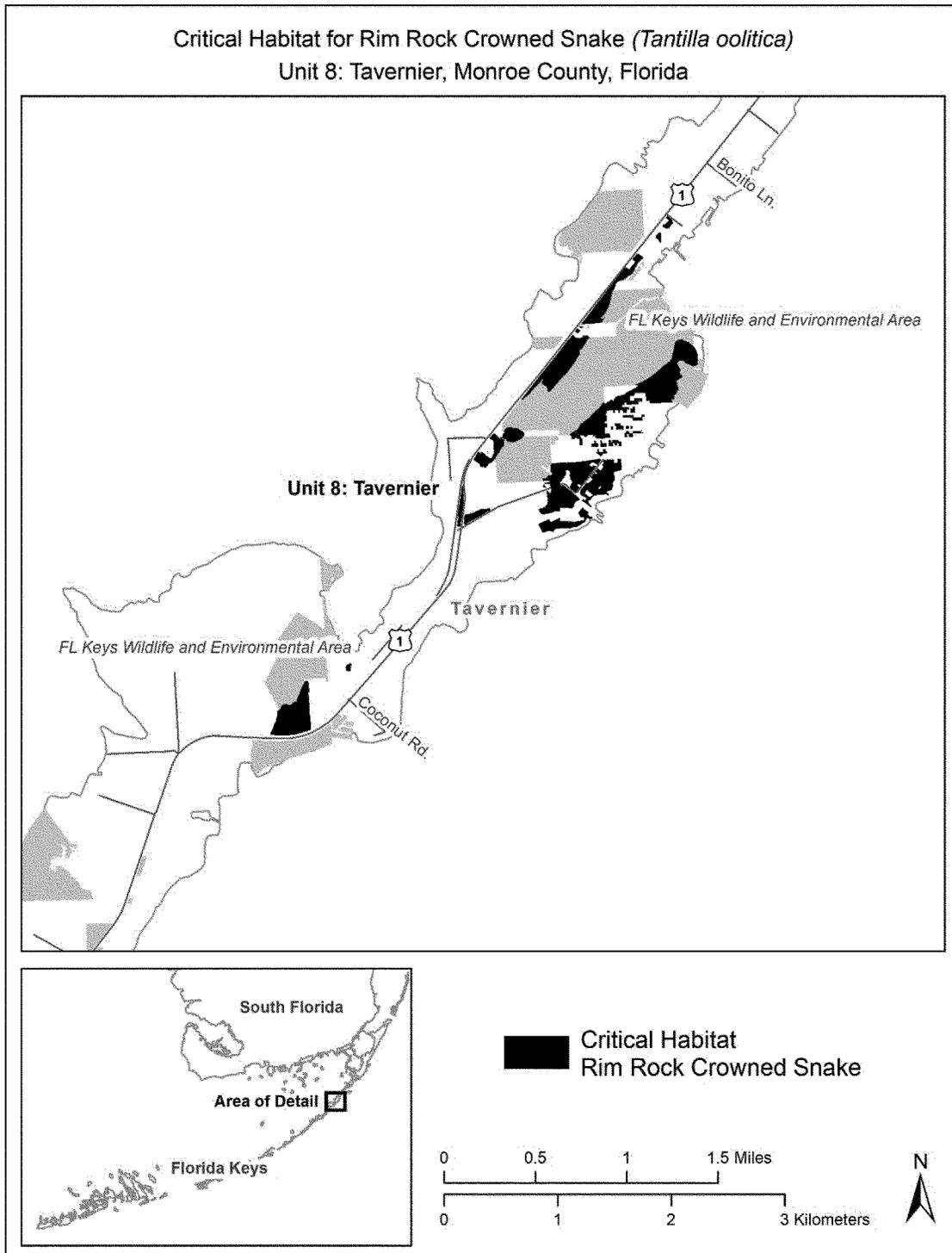
(13) Unit 8: Tavernier, Monroe County, Florida.

(i) Unit 8 consists of 181 ac (73 ha) in Monroe County, Florida, in the upper Florida Keys. The majority of the unit is bordered by U.S. Highway 1 on the northwest, and Peace Avenue on the north. Two outparcels are bordered by

U.S. Highway 1 on the southeast. Located within Monroe County and part of the city of Tavernier, within the upper Florida Keys islands, the habitat in this unit is surrounded and/or fragmented by suburban and urban development, canals, and two-lane roads. It consists of 98 ac (40 ha) of State

lands, 30 ac (12 ha) of County/local government owned lands, and 54 ac (22 ha) of private lands.

(ii) Map of Unit 8 follows: Figure 9 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (13)(ii)

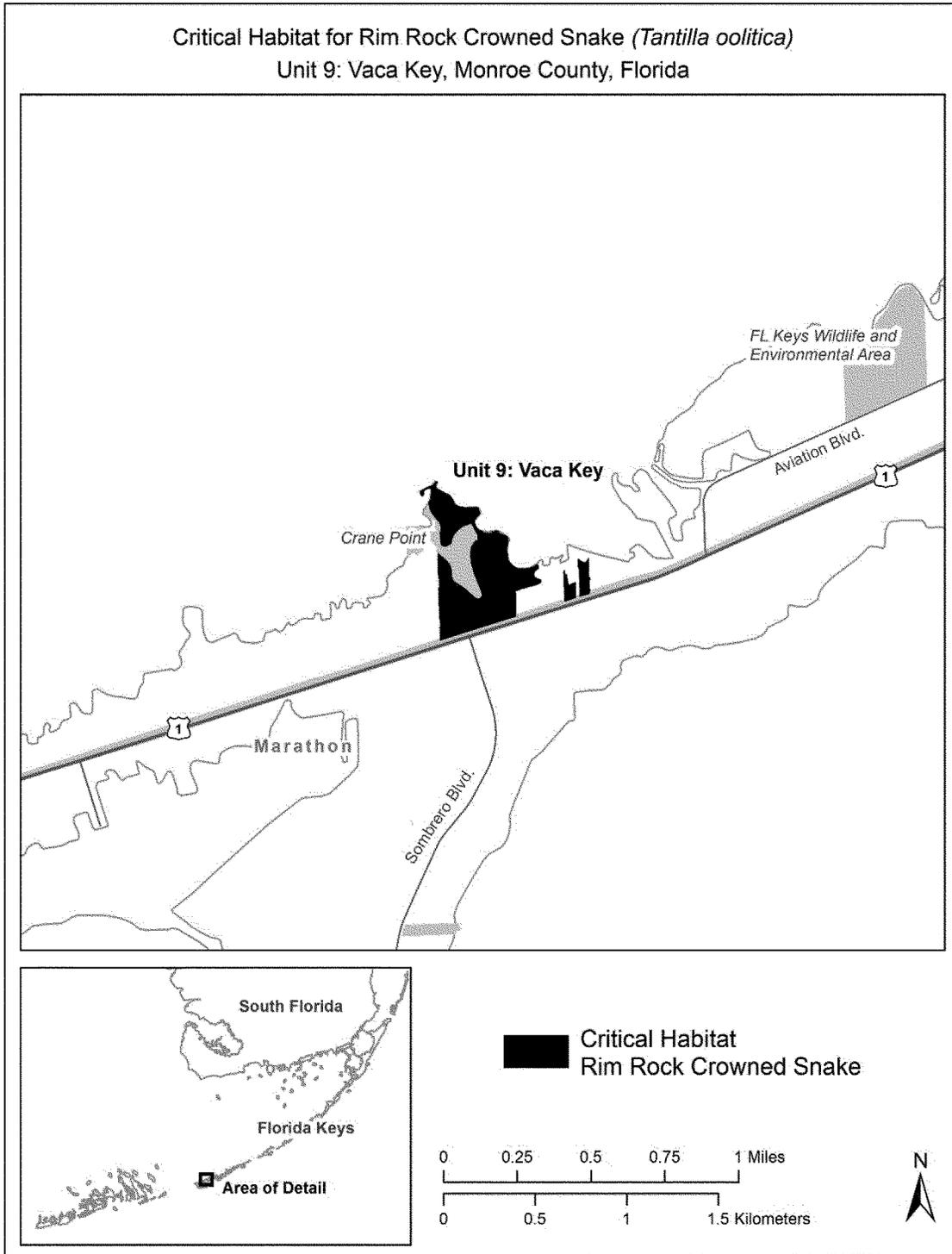


(14) Unit 9: Vaca Key, Monroe County, Florida.

(i) Unit 9 consists of 59 ac (24 ha) of habitat in Monroe County, Florida, in the upper Florida Keys. This unit is

bordered by U.S. Highway on the south. It is composed of 58 ac (23.5 ha) of privately owned land, and 1 ac (0.4 ha) of lands owned by County/local government.

(ii) Map of Unit 9 follows: Figure 10 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (14)(ii)



(15) Unit 10: Big Pine Key, Monroe County, Florida.

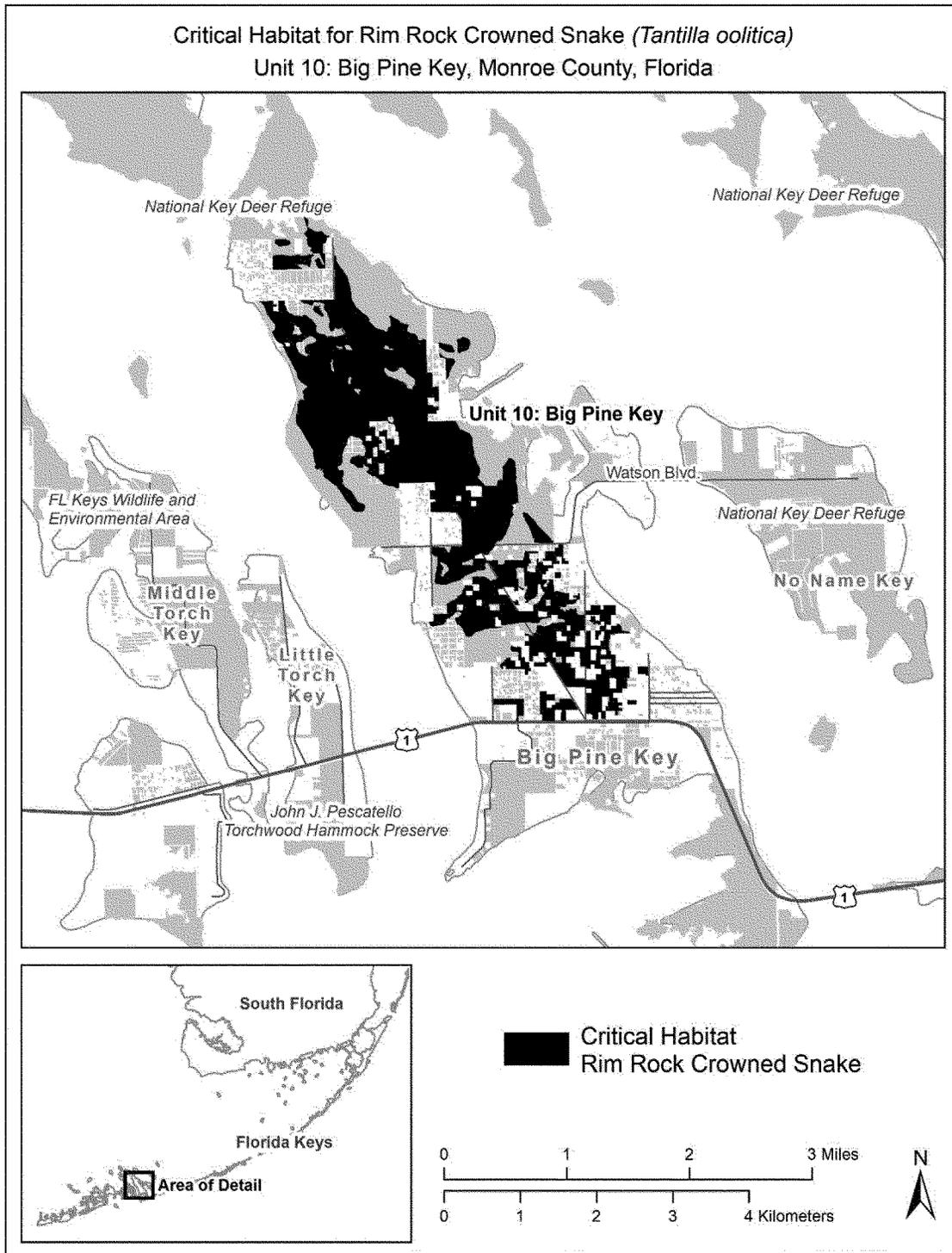
(i) Unit 10 consists of 1,729 ac (700 ha) in Monroe County, Florida, in the lower Florida Keys. This unit is bordered by U.S. Highway 1 on the

south. It consists of 1,200 ac (486 ha) of Federal land, 380 ac (154 ha) of State lands, 71 ac (29 ha) of locally owned lands, and 77 ac (31 ha) of private lands. The majority of this unit is owned and managed by the Service and associated

with the National Key Deer Wildlife Refuge.

(ii) Map of Unit 10 follows:

Figure 11 to Rim Rock Crowned Snake (*Tantilla oolitica*) paragraph (15)(ii)

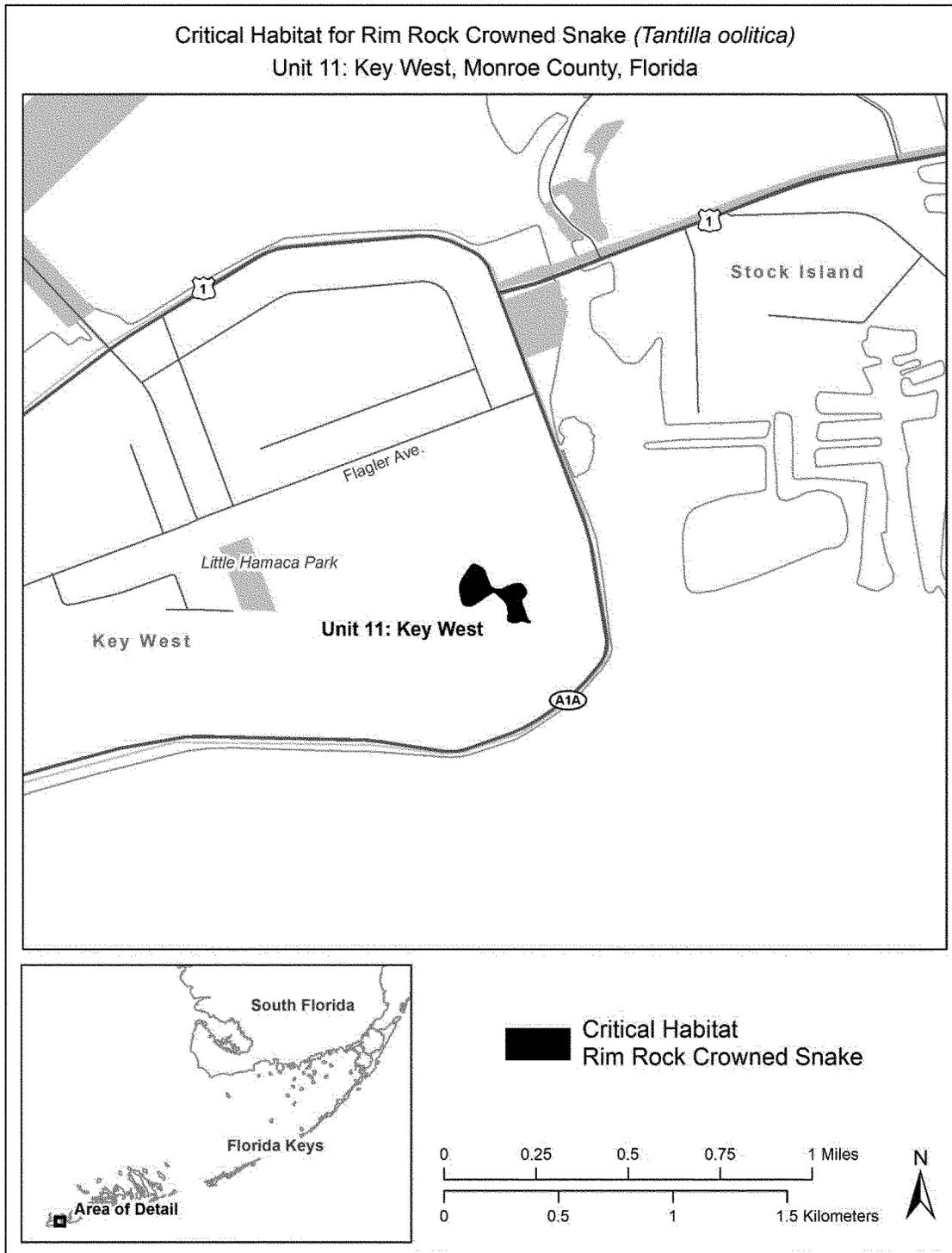


(16) Unit 11: Key West, Monroe County, Florida.

(i) Unit 11 consists of 9 ac (4 ha) in Monroe County, Florida, in the lower Florida Keys. Large resorts and hotels

are located to the east and the Key West International Airport is located to the south of this unit. It consists of 5 ac (2 ha) of local/County-owned land and 3 ac (1 ha) of private land.

(ii) Map of Unit 11 follows: Figure 12 to Rim Rock Crowned Snake (*Tantilla oolitic*) paragraph (16)(ii)



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