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50 CFR Part 17
Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Nine Bexar County, Texas, Invertebrates; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2010–0091; MO 92210–0–009]

RIN 1018–AX11

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Nine Bexar County, Texas, Invertebrates

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to revise critical habitat designation for the *Rhadine exilis* (ground beetle, no common name); *Rhadine infernalis* (ground beetle, no common name); Helotes mold beetle (*Batrisodes venyivi*); Cokendolpher Cave harvestman (*Texella cokendolpheri*); Robber Baron Cave meshweaver (*Cicurina baronia*); Madla Cave meshweaver (*Cicurina madla*); and Braken Bat Cave meshweaver (*Cicurina venii*) under the Endangered Species Act of 1973, as amended (Act). We also propose to designate critical habitat for the Government Canyon Bat Cave meshweaver (*Cicurina vespera*) and Government Canyon Bat Cave spider (*Neoleptoneta microps*). These species are collectively known as the nine Bexar County invertebrates. In total, we are proposing approximately 6,906 acres (ac) (2,795 hectares (ha)) as critical habitat for these invertebrates. The proposed critical habitat is located in Bexar County, Texas.

DATES: We will consider comments received or postmarked on or before April 25, 2011. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by April 8, 2011.

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

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments on Docket No. FWS–R2–ES–2010–0091.
- *U.S. mail or hand-delivery:* Public Comments Processing, *Attn:* Docket No. FWS–R2–ES–2010–0091; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will not accept e-mail or faxes. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (*see* the Public Comments section below for more information).

FOR FURTHER INFORMATION CONTACT: Adam Zerrenner, Field Supervisor, U.S. Fish and Wildlife Service, Austin Ecological Services Field Office, 10711 Burnet Road, Suite 200, Austin, TX 78758; by telephone at 512–490–0057 x248; or by facsimile at 512–490–0974. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Public Comments

This document consists of: (1) A proposed rule to revise designated critical habitat for the *Rhadine exilis* (ground beetle, no common name); *Rhadine infernalis* (ground beetle, no common name); Helotes mold beetle (*Batrisodes venyivi*); Cokendolpher Cave harvestman (*Texella cokendolpheri*); Robber Baron Cave meshweaver (*Cicurina baronia*); Madla Cave meshweaver (*Cicurina madla*); and Braken Bat Cave meshweaver (*Cicurina venii*); and (2) A proposed rule to designate critical habitat for Government Canyon Bat Cave meshweaver (*Cicurina vespera*) and Government Canyon Bat Cave spider (*Neoleptoneta microps*).

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

(1) The reasons why we should or should not designate habitat as "critical habitat" under section 4 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*) including whether there are threats to the species from human activity, the degree of which can be expected to increase due to the designation, and whether that increase in threat outweighs the benefit of designation such that the designation of critical habitat may not be prudent.

(2) Specific information on:

- The amount and distribution of any of the nine Bexar County invertebrates' habitat;
- What areas occupied at the time of listing and that contain features essential to the conservation of the species should be included in the designation and why;
- Special management considerations or protections that the features essential to the conservation of the nine Bexar County invertebrates identified in this proposal may require, including managing for the potential effects of climate change;
- What areas not occupied at the time of listing are essential for the conservation of the species and why; and
- Site-specific information on subsurface geologic barriers to movement of the species or lack thereof.
- The taxonomy and status of the ground beetle previously identified as *Rhadine exilis* in Black Cat Cave (proposed Unit 13) and the value of the cave and unit for conservation of the species.

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

(4) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation. We are particularly interested in any impacts on small entities or families, and the benefits of including or excluding areas that exhibit these impacts.

(5) Information on whether the benefit of an exclusion of any particular area outweighs the benefit of inclusion under section 4(b)(2) of the Act, in particular for those management plans covering specified lands used as mitigation under the La Cantera Habitat Conservation Plan (HCP) and lands on which impacts to the species have been authorized under that HCP. Copies of the La Cantera HCP are available from the Austin Ecological Services Field Office (*see* **FOR FURTHER INFORMATION CONTACT**).

(6) Information on the projected and reasonably likely impacts of climate change on any of the nine Bexar County invertebrates and the critical habitat areas we are proposing.

(7) Information related to our 90-day finding on the July 8, 2010, petition to remove critical habitat Unit 13 from designation (*see Previous Federal Actions* below).

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

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We will not accept

comments sent by e-mail or fax or to an address not listed in the **ADDRESSES** section. We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov.* You may request at the top of your document that we withhold personal information such as your street address, phone number, or e-mail address from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Austin Ecological Services Field Office (*see* **FOR FURTHER INFORMATION CONTACT**).

Background

It is our intent to discuss only those topics directly relevant to the designation and revised designation of critical habitat in this proposed rule. For more information on the *Rhadine exilis* (ground beetle, no common name), *Rhadine infernalis* (ground beetle, no common name), Helotes mold beetle, Cokendolpher Cave harvestman, Robber Baron Cave meshweaver, Madla Cave meshweaver, Braken Bat Cave meshweaver, Government Canyon Bat Cave meshweaver, and Government Canyon Bat Cave spider, refer to the final listing rule published in the **Federal Register** on December 26, 2000 (65 FR 81419), the proposed critical habitat designation published August 27, 2002 (67 FR 55063), and the final critical habitat designation published April 8, 2003 (68 FR 17155).

The nine species for which we are proposing to designate critical habitat or to revise critical habitat are collectively known as the nine Bexar County invertebrates, and they inhabit caves or other features known as "karst." The term karst refers to a type of terrain that is formed by the slow dissolution of calcium carbonate from limestone bedrock by mildly acidic groundwater. This process creates numerous cave openings, cracks, fissures, fractures, and sinkholes, and the bedrock resembles Swiss cheese. All of these species are subterranean-dwelling, non-aquatic species of local distribution in north and northwest Bexar County, Texas. They spend their entire lives underground, but surface features are very important as they provide links to drainage into the caves. The following information relates to the designation for all nine species.

Individuals comprising the nine Bexar County invertebrates are small, ranging in length from 0.04 inch (in) (1 millimeter (mm)) to 0.4 in (1 centimeter (cm)). They are eyeless, or essentially eyeless, and most lack pigment or coloration. Adaptations to cave life may include adjustments to the low quantities of food, including low metabolism; long legs for efficient movement; and loss of eyes, possibly as an energy-saving trade-off (Howarth 1983, pp. 374–376). These invertebrates may be able to survive from months to years existing on little or no food (Howarth 1983, p. 375). Average life spans of the listed Bexar County invertebrates in central Texas are unknown, but are likely multiple years for some species (*Cicurina* spp.), based on observations of juveniles kept in captivity (Veni and Associates 1999, p. 165). Reproductive rates of troglobites (small, cave-dwelling animals that have adapted to their dark surroundings), such as these nine invertebrates, are typically very low (Poulson and White 1969, p. 977; Howarth 1983, p. 375).

Based on surveys conducted by Krejca and Weckerly (2007, pp. 286–288), Culver (1986, p. 429), Elliott (1994a, p. 15), and Hopper (2000, p. 459), population sizes of troglobitic invertebrates in humanly-accessible karst features are typically low, with most species known from only a few specimens (Culver *et al.* 2000, p. 2350). While very little is known about the ecology of the nine Bexar County invertebrates, they are known to be top predators in their ecosystem (Service 2008, p. 1.4–5) and are dependent on the stability of their prey base that make up the lower trophic levels of the karst ecosystem (Taylor *et al.* 2004, p. 28).

Because sunlight is absent or only present in extremely low levels in caves, most karst ecosystems depend on nutrients derived from the surface (organic material brought in by animals, washed in, or deposited through root masses), or imported through the feces, eggs, and carcasses of trogloxenes (species that regularly inhabit caves for refuge, but return to the surface to feed) and troglophiles (species that may complete their life cycle in the cave, but may also be found on the surface) (Barr 1968, pp. 47–48; Poulson and White 1969, pp. 971–972; Howarth 1983, pp. 376–377; Culver 1986, p. 429). Primary sources of nutrients include leaf litter, cave crickets (*Ceuthophilus* spp.), small mammals, and other vertebrates that defecate or die in the cave. While the life habits of the nine invertebrates are not well known, the species probably prey on the eggs, larvae, or adults of other cave invertebrates, such as cave crickets (Mitchell 1971b, p. 250).

Subsurface Environment

The nine Bexar County invertebrates require stable temperatures and constant, high humidity (Barr 1968, p. 47; Mitchell 1971b, p. 250). They have lost the adaptations needed to prevent desiccation in drier habitats (Howarth 1983, p. 368) and the ability to detect or cope with more extreme temperatures (Mitchell 1971a, pp. 300–301). Temperatures in caves are typically the average annual surface temperature with little variation (Howarth 1983, p. 373; Dunlap 1995, p. 76). Relative humidity is typically near 100 percent in caves that support troglobitic invertebrates (Elliott and Reddell 1989, p. 6; Zara 2010, pp. 9–10).

Microhabitat is an important component of features occupied by the nine Bexar County karst invertebrates and has been quantified for three of the listed species that occur on Camp Bullis, *R. exilis, R. infernalis,* and Madla Cave meshweaver (Zara and Veni 2009, pp. 499–505). In observations made in 13 caves, *R. exilis* was seldom found near an entrance (11 out of 147 instances), occasionally found further from the cave entrance in the twilight zone (typified by very little light and more stable humidity and temperatures than the entrance area) (44 out of 147 instances), and more often found deeper in the caves' dark zones (typified by total darkness, stable humidity and temperature) (91 out of 147 instances). The recorded microhabitats (53 instances) occupied by *R. exilis* were varied, with about 66 percent of them on top of the substrate and 34 percent under rocks or on the undersides of rocks or other materials (Zara and Veni 2009, pp. 497, 503).

From measurements made in three caves, *R. infernalis* was found in the entrance (6 out of 23 instances) and twilight zone (10 out of 23 instances) more often that the dark zone (7 out of 23 instances). The species was found under rocks 85 percent of the time (Zara and Veni 2009, pp. 504–505).

From 75 observations made in 2 caves, Madla Cave meshweavers were found 3 times in the twilight and 72 times in the dark. The species was always found among loose rocks or mud balls. In 117 of the 135 instances where location in respect to substrate was recorded, they were underneath or on the underside of rocks. The other times they were on top of rocks (Zara and Veni 2009, pp. 506–512).

During temperature extremes, the nine Bexar County invertebrates may retreat into small, human-inaccessible,

interstitial spaces (mesocaverns), where the physical environment is more conducive to their humidity and temperature preferences (Howarth 1983, p. 372). These species may spend the majority of their time in interstitial spaces, only leaving them to forage in the larger cave passages (Howarth 1987, p. 377). Krejca and Weckerly (2007, p. 287) recommended 14 surveys to determine the presence of *R. exilis* (one of the nine Bexar County invertebrates) in a cave. Krejca and Weckerly (2007, pp. 287–288) hypothesized that when the species are not detected during surveys the invertebrates are in mesocaverns. Therefore, the mesocaverns should be considered a priority for conservation (Krejca and Weckerly 2007, pp. 287–288).

Connectivity of mesocaverns with larger features is needed to maintain gene flow through karst habitat, serve as a conduit for recolonization of features in the future if current habitat becomes unsuitable, provide refuge during times of extreme temperatures and low humidity, and allow for adaptive management of the species as new information becomes available. The Draft Bexar County Invertebrates Recovery Plan recommended good connectivity with mesocaverns for population dynamics of troglobites as a goal for maintaining a healthy karst ecosystem (Service 2008, p. B–1), but did not specify the area needed, because so little is known about the life-history requirements of these invertebrates.

The extent to which the species use mesocaverns between or around caves is not fully known. White (2006, pp. 76–78) studied the distribution of Bexar County karst invertebrates in detail and found that Hilger Hole, Eagle's Nest, Root Canal, and several other caves within and adjacent to Camp Bullis likely functioned as a single habitat patch, and the species had common genetic signatures between caves. The farthest distance between the entrances of these caves is about 1.5 miles (mi) (2.4 kilometers (km)). However, the area around Camp Bullis is different from many of the other Bexar County caves. All of the Camp Bullis area caves were formed within the damage zone of a fault where interconnected mesocaverns and entrance-less caves occur. Because the area is a faults zone, there are long distances of connectivity between mesocaverns. In another part of Bexar County, two caves (Robber's Cave and Hills and Dales Pit) have entrances about 0.3 mi (0.5 km) apart, have high similarity (although not identical) genetics of Madla Cave meshweavers (White 2006, pp. 97–99), and have mesocaverns that are connected (White, SWCA, pers. comm., 2010). Many of the caves where the nine Bexar County invertebrates occur are interconnected with mesocaverns, and some caves have no entrances.

The northern portion of Bexar County is located on the Edwards Plateau, a broad, flat expanse of Cretaceous carbonate rock that ranges in elevation from 1,100 feet (ft) (335 meters (m)) to 1,900 ft (580 m) (Veni 1988, p. 11; Soil Conservation Service 1966, p. 1). This portion of the Edwards Plateau is dissected by numerous small streams. To the southeast of the Edwards Plateau lies the Balcones Fault Zone, a 16-mi (25-km) wide fault zone that extends from the northeast corner of the County to the western County line. The many streams and karst features of this zone recharge the Edwards Aquifer.

The principal cave-containing rock units of the Edwards Plateau are the upper Glen Rose Formation, Edwards Limestone, Austin Chalk, and Pecan Gap Chalk (Veni 1988, p. 24). The Edwards Limestone accounts for one-third of the cavernous rock in Bexar County, and contains 60 percent of the caves. The Austin Chalk outcrop is second to the Edwards in total number of caves. In Bexar County, the outcrop of the upper member of the Glen Rose Formation accounts for approximately one-third of the cavernous rock, but only 12.5 percent of Bexar County caves (Veni 1988, p. 15). In Bexar County, the Pecan Gap Chalk, while generally not cavernous, has a greater than expected density of caves and passages (Veni 1988, p. 24).

Veni (1994, pp. 68–76) delineated six karst areas (karst fauna regions (KFRs)) within Bexar County: Stone Oak, UTSA (University of Texas at San Antonio), Helotes, Government Canyon, Culebra Anticline, and Alamo Heights (Figure 1). These KFRs are bounded by geological or geographical features that may represent obstructions to the movement (on a geologic time scale) of troglobites, which has resulted in the present-day distribution of endemic (restricted to a given region) karst invertebrates in the Bexar County area. The basis for these divisions is the lack of continuity between caves that may form complete barriers or significant restrictions to migration of troglobites over modern or geologic time scales. These discontinuities are defined based on characteristics that affect cave development combined with the geologic history of the area.

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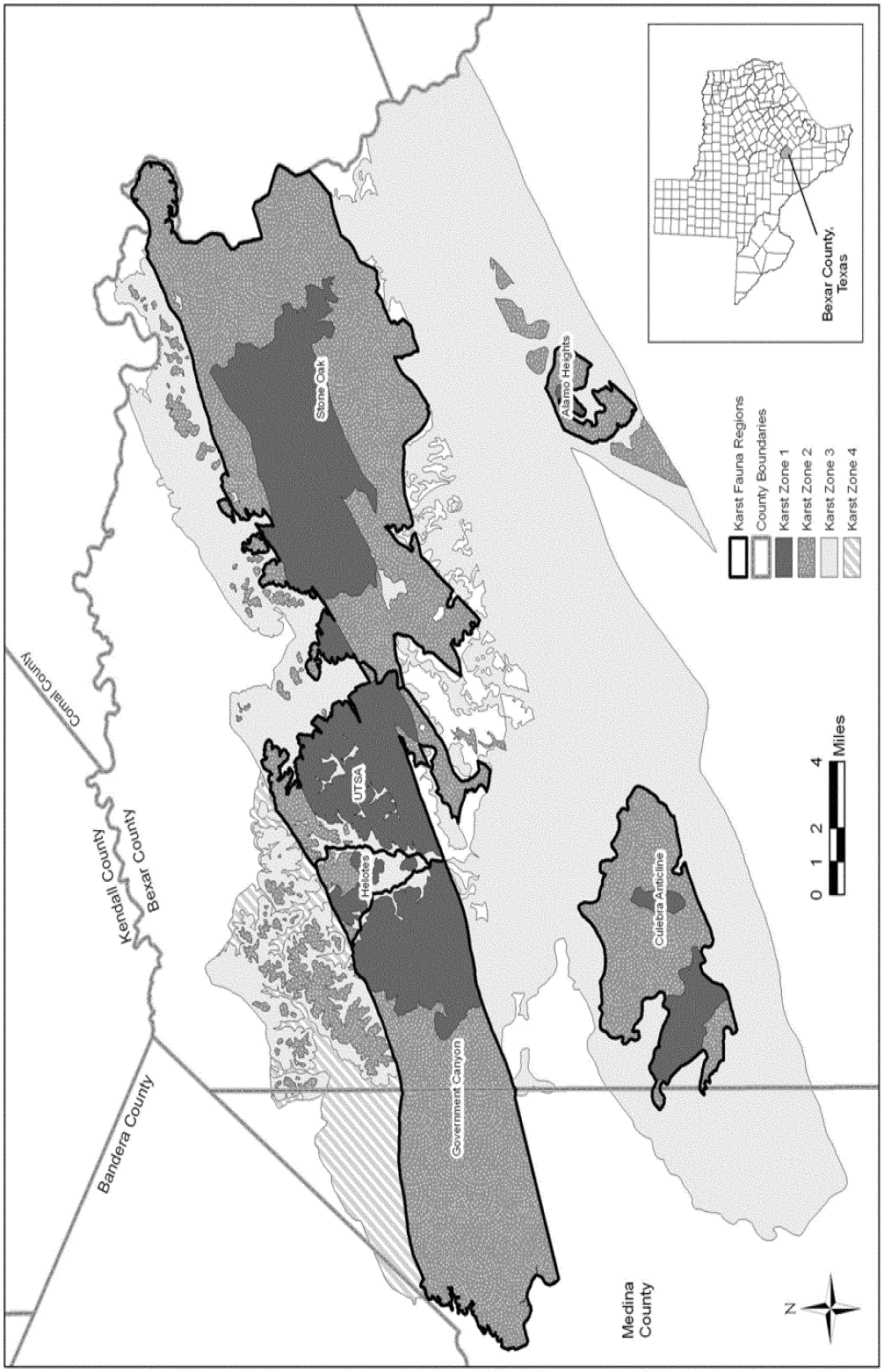
Figure 1. Karst Fauna Regions and Karst Zones in Bexar County, Texas.



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The KFRs were analyzed using the current range of 19 troglobitic species, including the 9 Bexar County invertebrates (Veni 1994, pp. 72–73). The KFRs are important because they are used to establish recovery criteria for individual species in the Draft Bexar County Karst Invertebrate Recovery Plan. To meet those criteria, specified numbers of preserves of a given quality

must be protected within each KFR in which they occur.

Also, the six KFRs were delineated by Veni (2003, pp. 10–18) into five zones that reflect the likelihood of finding a karst feature that will provide habitat for the endangered invertebrates, based on geology, distribution of known caves, distribution of cave fauna, and primary factors that determine the presence, size, shape, and extent of caves with respect to cave development. As described by Veni (2003, pp. 10–18), these five zones are defined as:

Zone 1: Areas known to contain one or more of the nine Bexar County invertebrates (areas where species are present).

Zone 2: Areas having a high probability of suitable habitat for the invertebrates (areas that may contain one or more invertebrates, but have not been fully surveyed).

Zone 3: Areas that probably do not contain the invertebrates (because there is very little suitable karst habitat).

Zone 4: Areas that require further research, but are generally equivalent to Zone 3, although they may include sections that could be classified as Zone 2 or 5 (areas where less is known about the karst structure than with Zone 3).

Zone 5: Areas that do not contain the Bexar County invertebrates (areas with units of rock that do not contain karst habitat).

Surface Environment

Animal Community

Cave Crickets

Cave crickets are a critical source of nutrient input for karst ecosystems (Barr 1968, p. 48; Reddell 1993, p. 2). Cave crickets in the genus *Ceuthophilus* occur in most caves in Texas (Reddell 1966, pp. 32–34). Sensitive to temperature extremes and dry environments, cave crickets forage on the surface at night and roost underground during the day. Taylor *et al.* (2005, p. 103) found that cave crickets lay their eggs in the cave, providing food for a variety of karst species (Mitchell 1971b, p. 250). Some karst species also feed on cave cricket feces (Barr 1968, p. 51; Poulson *et al.* 1995, p. 226), and on adults and juveniles directly (Elliott 1994a, p. 16). Cave crickets are scavengers or detritivores (animals that feed on decomposing organic matter), feeding on dead insects, carrion, and some fruits, but not on foliage (Elliott 1994a, p. 16; Taylor *et al.* 2004, p. 29).

Elliott (1994a, p. 8) evaluated cave cricket foraging within 164 ft (50 m) of cave entrances. In a more recent study, Taylor *et al.* (2005, p. 97) found that cave crickets foraged much farther, up to 344 ft (105 m) from a cave entrance.

Other Surface Animals

Many central Texas caves with endangered invertebrate species are frequented by mammals, reptiles, and amphibians (Reddell 1967, p. 184). Although there are no studies documenting the role of mammals in central Texas cave ecology, the presence of a large amount of animal materials (such as scat, nesting materials, and dead bodies) indicates they are probably important sources of nutrients. In particular, important sources of nutrients for the cave species may be the fungus, microbes, and other troglophiles and troglobites that grow or feed on animal feces (Elliott 1994b, p. 16; Gounot 1994, p. 204).

For predatory troglobites (such as the nine Bexar County karst invertebrates), invertebrates that accidently occur in the caves may also be an important nutrient source (Hopper 2000, p. 2349). Documented accidental species include snails, earthworms, terrestrial isopods (commonly known as pillbugs or potato bugs), scorpions, spiders, mites, collembola (primitive wingless insects that are commonly known as springtails), thysanura (commonly known as bristletails and silverfish), harvestmen (commonly known as daddy-long-legs), ants, leafhoppers, thrips, beetles, weevils, moths, and flies (Reddell 1965, pp. 146–179; 1966, pp. 27–29; 1999, pp. 40–41).

The imported red fire ant (*Solenopsis invicta*) (fire ant) is an aggressive predator, which has had a devastating and long-lasting impact on native ant populations and other arthropod communities (Vinson and Sorenson 1986, p. 17; Porter and Savignano 1990, p. 2095) and is a threat to the nine Bexar County invertebrates (Elliott 1994b, p. 15; Service 1994, pp. 63–64). Fire ants have been observed building nests both within and near cave entrances as well as foraging in caves, especially during the summer. Shallow caves inhabited by the nine Bexar County invertebrates make them especially vulnerable to invasion by fire ants and other exotic species. Fire ants have been observed preying on several cave species (Elliott 1994b, p. 15). Karst fauna that are most vulnerable to fire ant predation are the eggs, nymphs, and slower-moving adults (James Reddell, Texas Memorial Museum, pers. comm., 2006). The presence of fire ants in and around karst areas could have a drastic detrimental effect on the karst ecosystem through loss of both surface and subsurface species that are critical links in the food chain. Besides direct predation, fire ants threaten listed invertebrates by reducing the nutrient input carried in by cave crickets and other trogloxenes. Because fire ants are voracious, they can out-compete crickets for food resources (Taylor *et al.* 2003, pp. 109–110), leading to a reduction in overall productivity in the caves.

The invasion of fire ants is known to be aided by "any disturbance that clears a site of heavy vegetation and disrupts the native ant community" (Porter *et al.* 1988, p. 916). Porter *et al.* (1991, p. 873) state that control of fire ants in areas greater than 12 ac (5 ha) may be more effective than in smaller areas, because multiple queen fire ant colonies reproduce primarily by "budding," where queens and workers branch off from the main colony and form new sister colonies. Maintaining large, undisturbed areas of native vegetation may also help sustain the native ant communities (Porter *et al.* 1988, p. 916; 1991, p. 869).

Vegetation Community

Surface vegetation is an important element of the karst habitat for several reasons, including its role in providing nutrients from: (1) Direct flow of plant material into the karst with water; (2) habitat and food sources provided for the animal communities that contribute nutrients to the karst ecosystem (such as cave crickets, small mammals, and other vertebrates); and (3) roots that extend into subsurface areas. Surface vegetation also acts as a buffer for the subsurface environment against drastic changes in temperature and moisture, and serves to filter pollutants before they enter the karst system (Biological Advisory Team 1990, p. 38). In some cases, healthy native plant communities also help control certain exotic species (such as fire ants) (Porter *et al.* 1988, p. 916) that may compete with or prey upon the listed species and other species (such as cave crickets) that are important nutrient contributors (Elliott 1994a, pp. 95–96; Lavoie *et al.* 2007, p. 126).

Tree roots may provide a major energy source in shallow caves (Howarth 1983, p. 373). Jackson *et al.* (1999, p. 11387) investigated rooting depth in 21 caves on the Edwards Plateau to assess the below-ground vegetational community structure and the functional importance of roots. They observed roots of plateau live oak (*Quercus fusiformis*) penetrating up to 82 ft (25 m) into the interior of one of the caves. The roots of five other tree species, post oak (*Q. sinuata*), cedar elm (*Ulmus crassifolia*), American elm (*U. americana*), sugar hackberry (*Celtis laevigata*), and Ashe juniper (*Juniperus asheii*), penetrated to

below 16 ft (5 m) into caves. These are all common species in the plateau. Most of the caves in Bexar County are less than 20 ft (6 m) deep, so roots have the potential to penetrate many of them.

Karst ecosystems are heavily reliant on surface plant and animal communities to maintain nutrient flows, reduce sedimentation, and resist exotic and invasive species. As the surface around a cave entrance becomes developed, native plant communities are often replaced with impermeable cover or exotic plants from nurseries. The abundance and diversity of native animals may decline due to decreased food and habitat combined with increased competition and predation from urban, exotic, and pet species. As native surface plant and animal communities are destroyed, food and habitat once available to trogloxenes decreases. It is unknown whether exotic species could contribute the same quantity and quality of nutrients to the karst ecosystem.

Woodland-Grassland Community

Because of the various roles played by surface vegetation in maintaining the cave and karst ecosystem, including the nine Bexar County invertebrate species that are part of the ecosystem, we examined the best available scientific information to estimate the surface vegetation needed to support ecosystem processes. The woodland-grassland mosaic community typical of the Edwards Plateau is a patchy environment composed of many different plant species. Van Auken *et al.* (1980, p. 23) studied the woody vegetation of the Edwards and Glen Rose formations in the southern Edwards Plateau in Bexar, Bandera, and Medina Counties. They encountered a total of 24 species of plants on the Edwards or Glen Rose geologic formations, two of the principal, cave-containing rock units of the Edwards Plateau.

To maintain natural vegetation communities over the long term, enough individuals of each plant species must be present for successful reproduction. The number of reproductive individuals necessary to maintain a viable or self-reproducing plant population is influenced by needs for satisfactory germination (Menges 1995, p. 123), genetic variation (Bazzaz 1983, pp. 267–268; Menges 1995, p. 123; Young 1995, pp. 154–155), and pollination (Groom 1998, p. 487; Jennersten 1995, p. 130; Bigger 1999, p. 239). Pavlik (1996, p. 136) stated that long-lived, self-fertilizing, woody plants with high fecundity would be expected to have minimum viable population sizes in the range of 50 to 250 reproductive individuals. Fifty reproductive individuals is a reasonable minimum figure for one of the dominant species of the community, Ashe juniper, based on reproductive profiles (Van Auken *et al.* 1979, p. 170; Van Auken *et al.* 1980, pp. 30–31; Van Auken *et al.* 1981, pp. 1251–1253). This figure would likely be an underestimate for other woody species present in central Texas woodlands, because other woody species are more sensitive to environmental changes and do not meet several of the life-history criteria needed for the lowest minimal viable population size. Although other woody species may require population sizes at the higher end of the range (near 250 individuals) to be viable, as suggested by Pavlik (1996, p. 136), we do not have the data to support that contention. Therefore, on the basis of our review of information available to us, and after soliciting input from a botanist with expertise in the Edwards Plateau (Dr. Kathryn Kennedy, Center for Plant Conservation, pers. comm., 2002), we consider a minimum viable population size for individual plant species composing a typical oak/juniper woodland found in central Texas to be 80 individuals per species. This estimate is based on a habitat type that, as a whole, is fairly mature, and on knowledge that the species are relatively long-lived and reproductively successful.

Based on an analysis of recorded densities, corrected for non-reproductive individuals, we then calculated the area needed to support 80 mature reproductive individuals per species for the 24 species reported by Van Auken *et al.* (1980, p. 23). We determined that the 4 highest area requirements to maintain at least 80 mature individuals were for species that occur at lower densities. These included 198 ac (80 ha) for brasil (*Condalia hookeri*), and approximately 80 ac (32 ha) for each of hoptree (*Ptelea trifoliata*), Mexican buckeye (*Ungnadia speciosa*), and chittamwood (*Bumelia lanuginosa*). Our calculations indicate that the area needed to maintain the seven species with the highest average dominance values, Ashe juniper, Texas live oak, Texas red oak (*Quercus texana*), catclaw acacia (*Acacia greggii*), evergreen sumac (*Rhus virens*), agarita (*Mahonias trifoliata*), and cedar elm (*Ulmus crassifolia*), is approximately 33 ac (13 ha). An area of 33 ac (13 ha) would maintain 80 reproductive individuals for 15 of the 24 species. The area needed to maintain the nine rarest plant species ranges from approximately 49 to 198 ac (20 to 80 ha) with 7 of species in the 65 to 80 ac (26 ha to 32 ha) range.

The Bexar County Invertebrates Draft Recovery Plan used a minimum viable population size of 80 individuals of the top 15 to 20 woodland species and recommended 80 ac (32 ha) of woodland habitat for establishing a high-quality preserve that maintains a diverse community of woody vegetation for at least 100 years (Service 2008, pp. B–9 to B–11).

Most literature found for central Texas native grasslands was descriptive and not quantitative in its treatment of species composition and dispersion. No literature was located that provided grassland species area curves or quantitative species density tables for the central Texas area. Two papers by Lynch (1962, p. 679; 1971, p. 890) examined grassland species on an 8-ac (3.2-ha) tract over time with 123 species and high species turnover. High species turnover can be indicative of a habitat area which is too small; however, pre- and post-drought conditions may also have affected this situation. In a slightly more mesic grassland habitat, Robertson *et al.* (1997, p. 65) found that a 10-ac (4-ha) site captured most of the grassland species diversity (100 species) present, although it does not address population sizes and persistence in isolation, and an increase to a 14-ac (6-ha) tract increased species representation to 140. Another paper on a grassland in a more westerly and drier location in central Texas recorded 157 taxa in a 40-ac (16-ha) enclosure between 1948 and the mid-1970s (Smeins *et al.* 1976, pp. 24–25).

The Draft Bexar County Invertebrates Recovery Plan recommends that 10 ac (4 ha) of total grassland area within a woodland-grassland mosaic is needed in the preserves. This figure was derived by adding a 2 ac (0.8 ha) margin to the 8 ac (3 ha) tract (*see* previous paragraph) with typical species diversity based on Lynch's (1962, p. 679; 1971, p. 890) studies to provide additional area that would aid community stability if the high species turnover there was not due to regional drought influences alone.

Edge Effects

To maintain a viable vegetative community, including woodland and grassland species, an undisturbed area is needed to shield the core habitat from impacts associated with edge effects or disturbance from adjacent urban development (Lovejoy *et al.* 1986, p. 284; Yahner 1988, pp. 333–334). In this context, edge effects refer to the adverse changes to natural communities (primarily from increases in invasive species and pollutants, and changes in

microclimates) from nearby areas that have been modified for human development.

The changes caused by edge effects can occur rapidly. For example, vegetation 6.6 ft (2 m) from a newly created edge can be altered within days (Lovejoy *et al.* 1986, pp. 258–259). Edges may allow invasive plant species to gain a foothold where the native vegetation had previously prevented their spread (Saunders *et al.* 1991, p. 23; Kotanen *et al.* 1998, p. 669; Suarez *et al.* 1998, pp. 2041–2042; Meiners and Steward 1999, p. 261). When plant species composition is altered as a result of an edge effect, changes also occur in the surface animal communities (Lovejoy and Oren 1981, p. 11; Harris 1984, pp. 72, 74; Mader 1984, p. 90; Thompson 1985, pp. 526–527; Lovejoy *et al.* 1986, pp. 283–284; Yahner 1988, p. 335; Fajer *et al.* 1989, p. 1199; Kindvall and Ahlen 1992, pp. 523, 528; Tscharntke 1992, pp. 534–535; Hanski 1995, p. 204; Lindenmayer and Possingham 1995, p. 236; Bowers *et al.* 1996 p. 188; Hill *et al.* 1996, p. 726; Kozlov 1996, pp. 99–100, 102; Kuussaari *et al.* 1996, pp. 791, 798; Turner 1996, p. 204; Mankin and Warner 1997, pp. 140–142; Burke and Nol 1998, p. 96; Didham 1998, p. 404; Suarez *et al.* 1998, p. 2041; Crist and Ahern 1999, p. 687; Kindvall 1999, p. 181). Changes in plant and animal species composition because of edge effects may unnaturally change the nutrient cycling processes required to support cave and karst ecosystem dynamics. To minimize edge effects, the area needed to support a native plant and animal community must have a sufficient perimeter area to protect it.

One recommendation for protecting forested areas from edge effects that are in proximity to clear-cut areas is use of the "three tree height" approach (Harris 1984, p. 110) for estimating the width of the perimeter area needed. We used this general rule to estimate the width of perimeter areas needed to protect the habitat areas. The average height of native mature trees in the Edwards woodland association in Texas ranges from 10 to 30 ft (3 to 9 m) (Van Auken *et al.* 1979, p. 177). Applying the "three tree height" general rule, and using the average value of 21.6 ft (6.6 m) for tree height, we estimated that a perimeter width of at least 66 ft (20 m) is needed around a core habitat area to protect the vegetative community from edge effects. Based on this rule, 10 ac (4 ha) is necessary to protect a 79-ac (32-ha) circular core area. We recognize that the "three tree height" approach described by Harris (1984, pp. 110–111) was based on the distance that effects of storm events ("wind-throw") from a surrounding clear-cut "edge" will penetrate into an old-growth forest stand. Although the effects of edge on woodland/grassland mosaic communities have not been well studied, we believe that the "three trees height" recommendation is the best available peer-reviewed science to protect woodland areas from edge effects (Dr. Kathryn Kennedy, Center for Plant Conservation, pers. comm., 2003).

Animal communities also should be protected from impacts associated with edge effects or disturbance from adjacent urban development. Edges can act as a barrier to dispersal of birds and mammals (Yahner 1988, p. 336; Hansson 1998, p. 55). Invertebrate species are affected by edges. Mader *et al.* (1990, p. 214) found that carabid beetles and lycosid spiders avoided crossing unpaved roads that were even smaller than 9 ft (3 m) wide. Saunders *et al.* (1990, p. 23) suggested that as little as 330 ft (100 m) of agricultural fields may be a complete barrier to dispersal for invertebrates and some species of birds. In general, for animal communities, species need buffers of 164 to 330 ft (50 to 100 m) or greater to ameliorate edge effects (Lovejoy *et al.* 1986, p. 263; Wilcove *et al.* 1986, pp. 249–250; Laurance 1991, p. 206; Laurance and Yensen 1991, pp. 78–79; Kapos *et al.* 1993, p. 425; Andren 1995, p. 237; Reed *et al.* 1996, p. 1102; Burke and Nol 1998, p. 96; Didham 1998, p. 397; Suarez *et al.* 1998, p. 2047).

Nonnative fire ants are known to be harmful to many species of invertebrates and vertebrates. In coastal southern California, Suarez *et al.* (1998, p. 2041) found that densities of the exotic Argentine ant (*Linepithema humile*), which has similar life-history and ecological requirements to the red imported fire ant (Dr. Richard Patrock, University of Texas at Austin, pers. comm., 2003), are greatest near disturbed areas. Native ant communities tended to be more abundant in native vegetation and less abundant in disturbed areas. Based on the association of the Argentine ant and distance to the nearest edge in urban areas, core areas may only be effective at maintaining natural populations of native ants when there is a buffer area of at least 660 ft (200 m) (Suarez *et al.* 1998, pp. 2050, 2052).

We do not have site-specific information on the area needed to maintain populations of animal species, including cave crickets, found in central Texas. Therefore, we are relying on information from other areas. Based on that information, animal communities should be protected by areas of 164 to 330 ft (50 to 100 m) or greater to ameliorate edge effects, and by areas of 660 ft (200 m) to protect against the effects of fire ants. From this data, we determined that a distance of 330 ft (100 m), in addition to the 344-ft (105-m) cave cricket foraging area, would be the minimum needed to protect the cave cricket foraging area from the effects of edge and nonnative species invasions.

Dispersal

The ability of individuals to move between preferred habitat patches is essential for colonization and population viability (Eber and Brandl 1996, p. 621; Fahrig and Merriam 1994, p. 52; Hill *et al.* 1996, pp. 725–726; Kattan *et al.* 1994, pp. 139, 143; Kindvall 1999, p. 172; Kozlov 1996, pp. 95–96; Kuussaari *et al.* 1996, p. 791; Turner 1996, p. 205). Patch shapes allowing connection with the highest number of neighboring patches increase the likelihood that a neighboring patch will be occupied (Fahrig and Merriam 1994, p. 53; Kindvall 1999, p. 172; Kuussaari *et al.* 1996, p. 791; Tiebout and Anderson 1997, p. 620). If movement among populations is restricted and a population is isolated, the habitat patch size must be large enough to ensure that the population can survive (Fahrig and Merriam 1994, p. 54).

Summary

The conservation of the endangered Bexar County karst invertebrates depends on a self-sustaining karst ecosystem, surface and subsurface drainage basins to maintain adequate quantity and quality of moisture, and a viable surface animal and plant community for nutrient input and protection of the subsurface from adverse impacts. The area needed to conserve such an ecosystem includes a minimum core area of 100 ac (40 ha) of healthy, native woodland-grassland mosaic comprised of 80 ac (32 ha) of woodland, 10-ac (4-ha) of grassland, and a 10-ac (4-ha) buffer to protect against edge effects. The 100-ac (40-ha) core area should encompass the surface and subsurface drainage basins of the occupied feature, the 344-ft (105-m) cave cricket foraging distance from the entrance to the cave, and a 330-ft (100-m) distance from the cave cricket area to protect against edge effects.

Listed Bexar County Invertebrates' Distribution

By 2000, about 400 caves were known from Bexar County (SWCA 2000). Of the 400 caves, 57 were known to contain 1 or more of the 9 Bexar County invertebrates at the time the species

were listed in 2000 (65 FR 81419; December 26, 2000). Currently, we are aware of 89 caves in Bexar County that contain 1 or more of the 9 Bexar County invertebrates (Table 1).

TABLE 1—CAVES KNOWN TO CONTAIN ONE OR MORE OF THE NINE LISTED BEXAR COUNTY KARST INVERTEBRATES

[We include subspecies in this table in order to show genetic diversity by cave]

Species (# of caves)	Cave name	Karst fauna
Rhadine exilis (51)	40 mm Cave *	Stone Oak.
	B–52 Cave *.	
	Backhole *.	
	Banzai Mud Dauber Cave *.	
	Black Cat Cave.	
	Blanco Cave.	
	Boneyard Pit *.	
	Bunny Hole *.	
	Constant Sorrow Cave *.	
	Cross the Creek Cave *.	
	Dos Viboras Cave *.	
	Eagle's Nest Cave *.	
	Hairy Tooth Cave.	
	Headquarters Cave *.	
	Hilger Hole *.	
	Hold-Me-Back Cave *.	
	Hornet's Last Laugh Pit.	
	Isocow Cave.	
	Kick Start Cave.	
	MARS Pit *.	
	MARS Shaft *.	
	Pain in the Glass Cave *.	
	Peace Pipe Cave *.	
	Platypus Pit *.	
	Poor Boy Baculum Cave *.	
	Ragin' Cajun Cave.	
	Root Canal Cave *.	
	Root Toupee Cave *.	
	Springtail Crevice.	
	Strange Little Cave *.	
	Up the Creek Cave *.	
	Christmas Cave	Helotes.
	Helotes Blowhole.	
	Helotes Hilltop Cave.	
	Logan's Cave.	
	unnamed cave ½ mile N. of Helotes.	
	Creek Bank Cave	Government Canyon.
	Government Canyon Bat Cave.	
	Lithic Ridge Cave.	
	Pig Cave.	
	San Antonio Ranch Pit.	
	Tight Cave.	
	Hills and Dales Pit	UTSA.
	John Wagner Ranch Cave No. 3.	
	Kamikazi Cricket Cave.	
	La Cantera Cave No. 1.	
	La Cantera Cave No. 2.	
	Mastodon Pit.	
	Robber's Cave.	
	Three Fingers Cave.	
	Young Cave No. 1.	
R. infernalis ewersi (3)	Flying Buzzworm Cave *	Stone Oak.
	Headquarters Cave *.	
	Low Priority Cave *.	
R. infernalis new subspecies (9)	Braken Bat Cave	Culebra Anticline.
	Caracol Creek Coon Cave	
	Game Pasture Cave No. 1.	
	Isopit.	
	King Toad Cave.	
	Max and Roberts Cave.	
	Obvious Little Cave.	
	Stevens Ranch Trash Hole Cave.	

TABLE 1—CAVES KNOWN TO CONTAIN ONE OR MORE OF THE NINE LISTED BEXAR COUNTY KARST INVERTEBRATES—Continued

[We include subspecies in this table in order to show genetic diversity by cave]

Species (# of caves)	Cave name	Karst fauna
	Wurzbach Bat Cave.	
R. infernalis infernalis (28)	Bone Pile Cave 10 K Cave. Canyon Ranch Pit. Continental Park Cave. Dancing Rattler Cave. Fat Man's Nightmare Cave. Government Canyon Bat Cave. Hackberry Sink. Lithic Ridge Cave. Pig Cave. San Antonio Ranch Pit. Scenic Overlook Cave. Sure Sink. Surprise Sink.	Government Canyon.
	Christmas Cave Helotes Blowhole. Logan's Cave. Madla's Cave. Madla's Drop Cave. Sir Doug's Cave.	Helotes.
	Genesis Cave	Stone Oak.
	John Wagner Ranch Cave No. 3 Kamikazi Cricket Cave. Mattke Cave. Robber's Cave. Scorpion Cave. Three Fingers Cave. Crownridge Canyon Cave.	UTSA.
Helotes mold beetle (8)	San Antonio Ranch Pit Scenic Overlook Cave. Tight Cave.	Government Canyon.
	Christmas Cave Helotes Hilltop Cave. Unnamed Cave ½ mile N of Helotes. Unnamed Cave ½ mile NE of Helotes.	Helotes.
	Unnamed Cave 5 miles NE of Helotes	UTSA.
Cokendolpher Cave harvestman (1).	Robber Baron Cave	Alamo Heights.
Robber Baron Cave meshweaver (2).	Robber Baron Cave meshweaver (2) OB3	Alamo Heights.
Madla Cave meshweaver (20)	Christmas Cave Madla's Cave. Madla's Drop Cave. Helotes Blowhole. Helotes Hilltop Cave.	Helotes.
	Headquarters Cave*	Stone Oak.
	Breathless Cave Feature No. 50. Hills and Dales Pit. John Wagner Ranch Cave No. 3. La Cantera Cave No. 1. Robber's Cave. Unnamed Cave Helotes Area.	UTSA.
	Fat Man's Nightmare Cave Lithic Ridge Cave. Lost Pothole.	Government Canyon.

TABLE 1—CAVES KNOWN TO CONTAIN ONE OR MORE OF THE NINE LISTED BEXAR COUNTY KARST INVERTEBRATES—Continued

[We include subspecies in this table in order to show genetic diversity by cave]

Species (# of caves)	Cave name	Karst fauna
	Pig Cave. San Antonio Ranch Pit. Scenic Overlook Cave. Surprise Sink.	
Braken Bat Cave	Braken Bat Cave	Culebra Anticline.
Government Canyon	Government Canyon Bat Cave	Government.
Government Canyon	Government Canyon Bat Cave Surprise Sink.	Government.

* Cave located on Camp Bullis.

Previous Federal Actions

We published a proposed rule to list the nine Bexar County karst invertebrate species as endangered in the **Federal Register** on December 30, 1998 (63 FR 71855). On November 1, 2000, the Center for Biological Diversity filed a complaint against the Service alleging that we exceeded our 1-year obligation to publish a final listing rule and make a determination whether to designate critical habitat for the nine Bexar County karst invertebrates. We published a final listing rule on December 26, 2000 (65 FR 81419). In the final listing rule, we determined that critical habitat designation was prudent. On August 27, 2002, we proposed that 25 units encompassing approximately 9,516 ac (3,857 ha) in Bexar County, Texas, be designated as critical habitat for the 9 karst invertebrates (67 FR 55063). The final critical habitat rule, designating approximately 1,063 ac (431 ha) in 22 units, was published on April 8, 2003 (68 FR 17155).

On July 17, 2007, the Center for Biological Diversity, Citizens Alliance for Smart Expansion, and Aquifer Guardians in Urban Areas provided us with a 60-day notice of intent to sue on the final critical habitat rule. On January 14, 2009, the plaintiffs (*CBD* v. *FWS,* case number 1:09–cv–00031–LY) filed suit in Federal Court (Western District of Texas) alleging that the Service failed to use the best available science and incorrectly made exclusions according to sections 3(5)(A) and 4(b)(2) of the Act. On December 18, 2009, the parties filed a settlement agreement where we agreed to submit a revised proposed critical habitat determination for publication in the **Federal Register** on or before February 7, 2011, and a final revised determination by February 7, 2012. This proposed rule is published in accordance with that agreement.

On July 8, 2010, we received a petition from Capital Foresight Limited Partnership to revise designated critical habitat for *Rhadine exilis* by removing Unit 13. The petitioner alleges that the original specimens collected from Black Cat Cave were never positively identified as *R. exilis,* another species of *Rhadine* with a slender body form similar to *R. exilis* occurs in a cave a short distance from Black Cat Cave that is likely connected by mesocaverns, and that two species of *Rhadine* with similar body forms have never been documented to occur in the same location. In addition, the petitioner asserts that drinking water is leaking into Black Cat Cave and that the habitat has been highly degraded by the Bulverde Road rending the area no longer suitable for conservation of the species. In reference to the petitioner's claims, more information is needed for us to make a determination. Information in our files indicates that a species expert has identified the original specimen collected from Black Cat Cave as *R. exilis* (T. Barr, pers. comm., 2010). At this time, we find that the petitioner presents substantial scientific or commercial information indicating that revising critical habitat for *R. exilis* may be warranted, but more information is needed. Therefore, with the publication of this rule, we are initiating a review to determine if revising critical habitat for *R. exilis* is warranted. For this proposed critical habitat rule, we believe that Unit 13 continues to meet the definition of critical habitat as discussed in the *Criteria Used to Identify Critical Habitat* section below. Thus, Unit 13 continues to be part of this proposed critical habitat rule, but changes may be made in the final rule based upon new information. This document constitutes our 90-day finding on the petitioned action. We request public comment on this finding. We will issue a 12-month finding on the petition in conjunction with the final critical habitat rule for the nine Bexar County invertebrates, which will address whether the petitioned action is warranted, as provided in section 4(b)(3)(B) of the Act.

Critical Habitat

Background

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

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

(a) Essential to the conservation of the species and

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

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

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 under 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

prohibition against Federal agencies carrying out, funding, or authorizing actions likely to result in the destruction or adverse modification of critical habitat. Section 7(a)(2) requires consultation on Federal actions that may affect critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner seeks or requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) would apply, but even in the event of a destruction or adverse modification finding, Federal action agency's and the applicant's obligation is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

For inclusion in a critical habitat designation, the habitat within the geographical area occupied by the species at the time it was listed must contain the physical and biological features essential to the conservation of the species, and be included only if those features may require special management considerations or protection. Critical habitat designations identify, to the extent known using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the physical and biological features laid out in the appropriate quantity and spatial arrangement for the conservation of the species). Under the Act and regulations at 50 CFR 424.12, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed only when we determine that those areas are essential for the conservation of the species and that designation limited to those areas occupied at the time of listing would be inadequate to ensure the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial 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 developed during the listing process for the species. Additional information sources may include 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, or other unpublished materials and expert opinion or personal knowledge.

Habitat is often dynamic, and species may move from one area to another over time. Climate change will be a particular challenge for biodiversity because the interaction of additional stressors associated with climate change and current stressors may push species beyond their ability to survive (Lovejoy 2005, pp. 325–326). The synergistic implications of climate change and habitat fragmentation are the most threatening facet of climate change for biodiversity (Hannah *et al.* 2005, p. 4). Current climate change predictions for terrestrial areas in the Northern Hemisphere indicate warmer air temperatures, more intense precipitation events, and increased summer continental drying (Field *et al.* 1999, pp. 1–3; Hayhoe *et al.* 2004, p. 12422; Cayan *et al.* 2005, p. 6; Intergovernmental Panel on Climate Change (IPCC) 2007, p. 1181). Climate change may lead to increased frequency and duration of severe storms and droughts (Golladay *et al.* 2004, p. 504; McLaughlin *et al.* 2002, p. 6074; Cook *et al.* 2004, p. 1015).

Furthermore, 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 required for recovery of the species. Areas that are important to the conservation of the species, but are outside the critical habitat designation, will continue to be subject to conservation actions we implement under section 7(a)(1) of the Act. Areas that support populations are also subject to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as determined on the basis of the best available scientific information at the time of the agency action. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. 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 these planning efforts calls for a different outcome.

Physical and Biological Features

In accordance with sections 3(5)(A)(i) and 4(b)(1)(A) of the Act and the regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied at the time of listing to propose as critical habitat, we consider the physical and biological features essential to the conservation of the species that may require special management considerations or protection. These include, but are not limited to:

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

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

(3) Cover or shelter;

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

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

We derive the specific physical and biological features required for the nine Bexar County invertebrates from studies of these species' habitat, ecology, and life history as described below.

Space for Individual and Population Growth and for Normal Behavior

The nine Bexar County invertebrates are terrestrial troglobites that require underground passages with stable temperatures (Howarth 1983, p. 373; Dunlap 1995, p. 76) and constant, high humidity (Barr 1968, p. 47; Mitchell 1971a, p. 250). In addition to the larger cave passages that are accessible by humans where the species are collected, the species also need mesocaverns (tiny voids that are connected to larger cave passages) (Howarth 1983, p. 371), which

provide additional habitat to sustain viable populations for the species (White 2006, pp. 100–101). During temperature extremes, small mesocavernous spaces connected to caves may have more favorable humidity and temperature levels than the cave (Howarth 1983, p. 371). However, the abundance of food may be less in mesocaverns than in the larger cave passages. Therefore, the nine Bexar County invertebrates may spend the majority of their time in mesocaverns, only leaving during temporary forays into the larger cave passages to forage (Howarth 1987, p. 377). Based on the information above, we identify karst-forming rock containing subterranean spaces (caves and connected mesocaverns) with stable temperatures, high humidities (near saturation), and suitable substrates (spaces between and underneath rocks for foraging and sheltering) to be a physical and biological feature needed by these species.

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

Surface Water

The nine Bexar County invertebrates need clean water that is free of pollutants to maintain stable humidity and temperatures. In order to maintain stable humidity, the amount of clean water varies depending on the size of the drainage basin, caves, and mesocaverns. Water enters the karst ecosystem through surface and subsurface drainage basins. Well-developed pathways, such as cave openings and fractures, rapidly transport water through the karst with little or no purification. Caves are susceptible to pollution from contaminated water entering the ground because karst has little capacity for self-purification. The route that has the greatest potential to carry water-borne contaminants into the karst ecosystem is through the drainage basins that supply water to the ecosystem. Because cave fauna require material washed in through entrances (including humanly inaccessible cracks), and because they require generally high humidity, it is critical to have drainage basins with unpolluted water. The surface drainage basin consists of the cave entrance and other surface input sources, such as neighboring sinkholes and soil percolation. The subsurface or groundwater drainage basin includes mesocaverns, subterranean streams, and sinkholes that have a connection to the surface, even though the groundwater drainage basin is not always observable from the surface. It is also important to note that the surface and subsurface drainage basins do not necessarily overlap. They may be of different size and direction (Veni 2003, pp. 7–8).

In conclusion, we identify clean surface water that flows into the karst features to be a physical and biological feature needed by these species. Sources may include runoff that flows into the caves' entrances or associated features through sinkholes or fractures, and through-ground flows via fractures, conduits, and passages.

Surface Plant and Animal Community

Areas around and over caves occupied by the nine Bexar County invertebrates need healthy surface plant and animal communities (*see* discussion in Background). Surface vegetation provides nutrients that support trogloxene and accidental species and provides nutrients through leaf litter and root masses that grow directly into caves (Howarth 1983, p. 373; Jackson *et al.* 1999, p. 11387). Because listed troglobites are at the top of their food chain (Service 2008, p. 4.1–5), habitat changes that affect their food sources (including plants and cave crickets) can affect troglobites (Culver *et al.* 2000, p. 395). Surface vegetation also protects the subsurface environment against drastic changes in the temperature and moisture regime. It serves to filter pollutants (to a limited degree) before they enter the karst system and protects against nonnative species invasions (Biological Advisory Team 1990, p. 38). Surface invertebrates provide food for trogloxenes, such as cave crickets, bats, toads, and frogs. Other animals wash or accidentally stumble into caves and are food sources for cave-limited species. A healthy native arthropod community may better stave off fire ants, a threat to the karst ecosystem (Porter *et al.* 1988, p. 914).

As discussed in the background section, cave crickets are an important source of nutrient input for karst ecosystems (Barr 1968, p. 48; Reddell 1993, p. 2). The cave crickets forage on the surface at night and roost in the cave during the day. Cave crickets provide food for karst species, which feed on their eggs, young, and feces (Mitchell 1971b, p. 250; Barr 1968, pp. 51–53; Poulson *et al.* 1995, p. 26).

Many of the vertebrate species that occasionally use caves bring in a significant amount of energy in the form of scat, nesting material, and carcasses. Natural quantities of all of these components are an important part of a functioning ecosystem. Therefore, based on the information above, we identify a healthy surface community of native plants (juniper-oak woodland) and animals (cave crickets) living in and near the karst feature that provides nutrient input and protects the karst ecosystem from adverse effects (nonnative species invasions, contaminants, and fluctuations in temperature and humidity), as being a necessary biological feature.

Primary Constituent Elements for the Nine Bexar County Invertebrates

Under the Act and its implementing regulations, we are required to identify the physical and biological features essential to the conservation of the nine Bexar County invertebrates in areas occupied at the time of listing, focusing on the features' primary constituent elements (PCEs). We consider primary constituent elements to be the elements of physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species.

Based on the above needs and our current knowledge of the life history, biology, and ecology of these species and the habitat requirements for sustaining the essential life-history functions of the species, we have determined that the nine Bexar County invertebrates' PCEs are:

(1) Karst-forming rock containing subterranean spaces (caves and connected mesocaverns) with stable temperatures, high humidities (near saturation), and suitable substrates (for example, spaces between and underneath rocks for foraging and sheltering);

(2) Surface water free of pollutants that flows into the karst features. Sources may include surface runoff that flows directly into the caves' entrances, or water that flows through associated features, such as sinkholes and fractures known to connect to the karst features, or water that flows through the connected subsurface drainage area and subsequently into caves and passages; and

(3) A healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) living near the karst feature that provides nutrient input and protects the karst ecosystem from adverse effects (for example, from nonnative species invasions, contaminants, and fluctuations in temperature and humidity).

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 that may require special management considerations or protection. The following information provides discussion of the threats to essential features and the special management considerations and protections needed to alleviate those threats.

The Bexar County human population is projected to increase 13.8 percent from 2010 to 2020, and 45.2 percent by 2050 (San Antonio Planning Department 2005, p. 1). Most of the threats to the PCEs are the result of this continued rapid population growth and associated urbanization. Threats include: Filling and collapsing of caves; alteration of drainage patterns, causing decreased water infiltration and karst drying or increased flooding; removal of native vegetation and replacement with impervious cover and nonnative plants; reducing nutrient input; changes in temperature; decreasing humidity; habitat contamination from human activities in the surface and subsurface drainage basins of caves and in adjacent karst areas; increased human visitation resulting in alteration of the cave habitat and direct mortality of listed species; and infestation by fire ants, a predator and competitor that can cause direct predation on and competition with trogloxenes like cave crickets, ultimately reducing nutrient input into the cave.

Veni (1994, p. 23) estimated in 1991 that about 26 percent of known caves in Bexar County had been destroyed through filling, capping, covering with roads and buildings, or blasting by construction and quarrying operations. Further loss undoubtedly has occurred since that report and will likely continue unless appropriate controls are implemented. Construction and development activities that may not destroy an entrance can still result in collapses of the cave ceiling or other adverse effects on the karst environment. On ranch land or in rural areas, it is not uncommon to use caves as trash dumps (Culver 1986, p. 434; Reddell 1993, p. 2) or to cover the entrances to prevent livestock from falling in (Elliott 2000, pp. 374–375). These activities can be detrimental to the karst ecosystem by causing direct destruction of habitat or altering the natural passage of organisms, water, detritus, and other organic matter into a cave. Quarrying of limestone and road base material is a widespread activity that can remove vegetation and destroy karst habitat. A number of occupied caves in Bexar County have been severely impacted in the past, and an examination of recent aerial photography reveals recent impacts to karst habitat in the vicinity of those areas.

Cave organisms are adapted to live in a narrow range of temperature and humidity. To sustain these conditions, both natural surface and subsurface flow of water and nutrients should be maintained. Decreases in water flow or infiltration can result in excessive drying and may slow decomposition, while increases can cause flooding that drowns air-breathing species and carries away available nutrients. Alterations to surface topography, including decreasing or increasing soil depth or adding nonnative fill, can change the nutrient flow into the cave and affect the cave community (Howarth 1983, p. 381). Changes in the amount of impermeable cover, collection of water in devices like storm sewers, increased erosion and sedimentation, and irrigation and sprinkler systems can affect water flow to caves. Altering the quantity of water, its organic content, the timing and extent of flood pulses, or droughts may negatively impact the listed species.

Karst ecosystems are heavily reliant on surface plant and animal communities to maintain nutrient flows, reduce sedimentation, and resist exotic and invasive species. As the surface around a cave entrance or over the associated karst ecosystem is developed, native plant communities are often replaced with impermeable cover or exotic plants from nurseries. The abundance and diversity of native animals may decline due to decreased food and habitat, combined with increased competition and predation from urban, exotic, and pet species. As native surface plant and animal communities are destroyed, food and habitat once available to trogloxenes decreases. Destruction of native plant communities can lead to increased erosion that causes sedimentation within caves. It is necessary to maintain the native woodland and grassland communities; therefore, a perimeter area is needed to shield the core vegetation habitat from impacts associated with edge effects or disturbance from adjacent urban development (Lovejoy *et al.* 1986, p. 284; Yahner 1988, pp. 333–334). Effects from such impacts can include increases in invasive species and pollutants, and changes in microclimates, which can adversely affect the listed species by impacting nutrient cycling processes important in cave/karst dynamics.

Much of the habitat occupied by the Bexar County invertebrates is particularly sensitive to groundwater contamination because little or no filtration occurs, and water penetrates rapidly through bedrock conduits (White 1988, p. 149). The ranges of these species are becoming increasingly urbanized, and, thereby, they are becoming more susceptible to contaminants including sewage, oil, fertilizers, pesticides, herbicides, seepage from landfills, pipeline leaks, or leaks in storage structures and retaining ponds. Activities on the surface, such as disposing of toxic chemicals or motor oil, can contaminate caves (White 1988, p. 388). Materials like cleaning agents, industrial chemicals, and heavy metals can also easily infiltrate subterranean ecosystems. Contamination of karst habitat can also occur from air pollutants and improper disposal of litter, motor oil, batteries, or other household products in or near caves (White 1988, pp. 399–400).

Continued urbanization will increase the likelihood that karst ecosystems are polluted by contamination from leaks and spills, which often have occurred in Bexar County. The Texas Commission on Environmental Quality (TCEQ 2010, pp. TCEQ–5 to TCEQ–8) summarized information on groundwater contamination reported by a number of agencies, and listed 109 groundwater contamination cases that occurred in Bexar County between 1980 and 2000, the majority of them spills or leaks of petroleum products. Groundwater contamination poses a threat to entire karst ecosystems and is particularly difficult to manage because pollutants can originate far from the sensitive karst site and flow rapidly through the subsurface (White 1988, pp. 387–388).

Fire ants are a pervasive, nonnative ant species originally introduced to the United States from South America over 50 years ago, and are an aggressive predator and competitor that has spread across the southern United States. They often replace native species, and evidence shows that overall arthropod diversity, as well as species richness and abundance, decreases in infested areas. Fire ants pose a major threat to the listed invertebrates in Bexar County through direct predation and competition with native species (such as cave crickets) for food resources. This threat is exacerbated by edge effects associated with the soil disturbance and disruption to native communities that accompany urbanization (refer to previous detailed discussion in Background).

Maintaining native vegetation communities greater than 12 ac (5 ha) may help sustain native ant populations and further deter fire ant infestations

(Porter *et al.* 1988, p. 914; 1991, p. 869). On Camp Bullis Military Reservation, in Bexar and Comal Counties, Texas, caves are located in large expanses of undeveloped land. Although there is some ground disturbance in portions of the area, caves on Camp Bullis had less fire ant infestation compared to caves in more urbanized areas even prior to beginning a fire ant treatment regime (Veni and Associates 1999, p. 55). In addition, Suarez *et al.* (1998, p. 2041) found that protection of a core area zone at least 330 ft (100 m) wide helps to reduce the severity of fire ant infestations.

Karst invertebrates in central Texas are especially susceptible to fire ant predation because most caves are relatively short and shallow. The hot dry weather may also encourage fire ants to move into caves during summer months, and cold weather may cause them to seek refuge or prey in the caves during the winter. Fire ants have been found within and near many caves in central Texas and have been observed feeding on dead troglobites, cave crickets, and other species within caves (Elliott 1992, p. 13; 1994, p. 15; 2000, pp. 668, 678; Reddell 1993a, p. 10; Taylor *et al.* 2003, p. 3). Besides direct predation, fire ants threaten listed invertebrates by reducing the nutrient input that fuels the karst ecosystem. Taylor *et al.* (2003, p. 3) found that cave crickets often arrived before fire ants at baits placed above ground at night, but the arrival of fire ants corresponded to the departure of cave crickets, indicating competition for at least some food resources. Of 36 caves visited during status surveys for the 9 Bexar County karst invertebrates, fire ants were found in 26 of them (Reddell 1993a, p. 32).

In summary, threats to the nine Bexar County invertebrates include clearing of vegetation for commercial or residential development, road building, quarrying, or other purposes. Infestation by nonnative vegetation causes adverse changes in the plant and animal community and possibly in the moisture availability. An increase in fire ants can occur with development and cause competition with and predation on other invertebrates in the karst ecosystem. In addition, filling cave features for construction, ranching, or other purposes can adversely affect the listed invertebrate species by reducing nutrient input, reducing small mammal access, and changing moisture regimes. Excavation for construction or operation of quarries can directly destroy karst features occupied by any of the nine Bexar County invertebrates, including the mesocaverns they use. Examples of management that would alleviate these threats include: (1) Protecting native vegetation around occupied karst features and overlying connected mesocaverns, cave cricket foraging areas, surface and subsurface drainage basins, temperature and humidity in karst features and mesocaverns; (2) protecting subsurface karst habitat around the cave footprint to allow movement of karst invertebrates through mesocaverns; (3) controlling fire ants around cave features and within the cave cricket foraging area; (4) preventing unauthorized access to karst features by installing fencing and cave gates; and (5) keeping the immediate areas surrounding cave features free from sources of contamination.

Criteria Used To Identify Critical Habitat

As required by section 4(b) of the Act, we used the best scientific and commercial data available in determining areas within the geographical area occupied at the time of listing that contain the features essential to the conservation of the nine Bexar County invertebrates, and areas outside of the geographical area occupied at the time of listing that are essential for the conservation of the nine Bexar County invertebrates. We relied on information in presence/absence survey reports submitted during project consultations with the Service, annual reports on research and recovery activities conducted under a section 10(a)(1)(A) scientific permit, annual 10(a)(1)(B) HCP reports, section 6 species status reports, and literature published in peer-reviewed journals. We also used information from the proposed (67 FR 55063; August 27, 2002) and final (68 FR 17155; April 8, 2003) critical habitat rules, draft recovery plan (Service 2008), and other information in our files. We are not currently proposing any areas outside the geographical area presently occupied by the species because occupied areas are sufficient for the conservation of the species.

Critical habitat units were delineated by creating approximate areas for the units by screen-digitizing polygons (map units) using ArcMap (Environmental Systems Research Institute, Inc.). We defined the boundaries of each unit based on the criteria below:

(1) We identified all areas known to be occupied by the species. We used verified identifications of specimens by recognized species experts. In the case of Madla Cave meshweaver, we also used genetic identification (Paquin and Hedin 2004, p. 3244).

(2) We included the cave footprint with the surface and subsurface drainage areas of the cave, where known.

(3) We included the cave cricket foraging area that is a 344-ft (105-m) circle around the cave entrance (Taylor *et al.* 2005, p. 97), plus an additional 330-ft (100-m) distance to protect against edge effects from invasive species (Lovejoy *et al.* 1986, p. 263; Wilcove *et al.* 1986, pp. 249–250; Laurance 1991, p. 206; Laurance and Yensen 1991, pp. 78–79; Kapos *et al.* 1993, p. 425; Andren 1995, p. 237; Reed *et al.* 1996, p. 1102; Burke and Nol 1998, p. 96; Didham 1998, p. 397; Suarez *et al.* 1998, p. 2047).

(4) We included contiguous geological formations of Karst Zone 1 (areas known to contain one or more of the nine Bexar County invertebrates) to protect mesocaverns likely connected to the caves to a distance of 0.3 mi (0.5 km) from the cave entrance (Kemble White, SWCA, pers. comm., 2010; White 2006, pp. 97–99).

(5) We also included native vegetation of an area of at least 100 ac (40 ha) needed to support the diversity of native plant species normally found in the Edwards Plateau communities and in their normal abundance (Service 2008, pp. B–9 to B–12). This number was derived for woodlands by examining studies of Van Auken *et al.* (1979, p. 170), Van Auken *et al.* (1980, pp. 30–31), Van Auken *et al.* (1981, pp. 1251–1253), and analysis by Dr. Kathryn Kennedy (Center for Plant Conservation, pers. comm. 2002), and Lynch (1962, p. 679; 1971, p. 890). Critical Habitat Units 10a, 10b, 11a through d, and 24 have areas less than 100 ac (40 ha) being proposed for critical habitat, but these units still meet the criterion of having at least 100 ac (40 ha) of native vegetation surrounding the karst ecosystems. We reduced these proposed critical habitat units in size because some of their surface area is being exempted based on the Camp Bullis Military Reservation Integrated Natural Resources Management Plan (*see* Exemptions section below).

Using the distances between caves whose mesocaverns are likely connected as a guide, we analyzed distance from a cave through which karst invertebrates are likely to move through mesocaverns in Bexar County as part of this critical habitat proposed rule. We examined the information on the area around Camp Bullis and found it was not representative of many Bexar County caves, because of the unique geological conditions there. All of the Camp Bullis area caves were formed within the damage zone of a fault where

interconnected mesocaverns and entrance-less caves occur. Because the area is a fault zone, there are long distances of connectivity between mesocaverns. Rather than using the greater distance karst invertebrates are likely to move, we found 0.3 mi (0.5 km) to be a more realistic distance over which karst invertebrates potentially move through mesocaverns in Bexar County. We selected 0.3 mi (0.5 km) because of the connection distance of the mesocaverns of Robbers Cave and Hills and Dales Pit, which are located in another part of Bexar County, similar genetics between meshweavers in the caves, and the lack of faulting or other geological anomalies between them. We believe 0.3 mi (0.5 km) is a reasonable distance limit that karst invertebrates could move through mesocaverns. Although the genetics of the species in the caves are not identical, this represents the best available information we have. The 0.3-mi (0.5-km) distance was in Karst Zone 1, and the caves do not have geologic barriers to movement between them. Based on the best available information, we believe it is an appropriate distance to represent potential use of mesocaverns by the nine Bexar County invertebrates.

An area with a 0.3-mi (0.5-km) radius is equal to 179 ac (72 ha). We used this 179-ac (72-ha) area around cave locations with known occurrences as a guide for mapping the physical and biological features essential to the conservation of the nine Bexar County invertebrates. We designated all of Karst Zone 1 within the 0.3-mi (0.5-km) radius of the cave. In units where we needed additional surface habitat to reach the 100-ac (40-ha) target for native vegetation, we included adjacent surface habitat over Karst Zone 1 surface habitat. If native vegetation was not available in a Karst Zone 1 area, we used other Karst Zones to reach the target surface acreage. In units that are all Karst Zone 1 and are fully vegetated, the 179-ac (73-ha) area of native vegetation derived using the 0.3-mi (0.5-km) radius circle around cave entrances is included. In units with high levels of surface impact or with only a small amount of Karst Zone 1, we went outside the 0.3-mi (0.5-km) radius around cave locations to include at least 100 ac (40 ha) of vegetation.

When the 0.3-mi (0.5-km) distance around individual cave entrances in Karst Zone 1 (areas known to contain one or more of the nine Bexar County invertebrates) or the expanded vegetation community overlapped, we included caves in the same unit. We did not include area for cave cricket foraging if it was on the other side of an urban edge like a major roadway because such edges act as barriers to cricket movement.

In this proposed critical habitat for the nine Bexar County invertebrates, we selected areas based on the best scientific data available that possess those physical and biological features essential to the conservation of the species and that may require special management considerations or protection. We identified critical habitat units that are known to be occupied based on one or more surveys that resulted in the collection of a specimen from the karst feature and verification of species by a taxonomic expert. Even though the nine Bexar County invertebrates spend their entire lives underground, we included specific surface features when identifying critical habitat units because they are important drainage links into the caves and because surface habitat is needed to support the plant and animal communities upon which the invertebrates depend. Because some of the rarer species are difficult to collect, and it may take many attempts to collect even more common species, we included all locations with historic records of species occupancy, regardless of date. In the case of the Madla Cave meshweaver, in addition to morphological identifications, we used genetic identification of specimens to verify known locations (Paquin and Hedin 2004, p. 3244). We determined the units based on the presence of one or more of the defined PCEs and the kind, amount, and quality of habitat associated with those occurrences. Some of the units contain the appropriate quantity and distribution of PCEs to support the life cycle stages we have determined as essential to the conservation of the species. Other units or portions of units contain only a portion of the PCEs. We did this because the PCEs that are present can support the listed species, even though not all PCEs are present. For example, surface habitat without a healthy plant and animal community can continue to support listed invertebrates below the surface, and clean water from modified surface areas can provide the humidity needed by the listed invertebrates.

When determining proposed critical habitat boundaries within this proposed rule, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures which lack the surface PCEs for the nine Bexar County invertebrates. However, we included some developed areas even though such lands lack the surface PCEs for the nine Bexar County invertebrates. We included these developed lands because they contain the subsurface PCEs needed by the invertebrates, such as karst-forming rock containing subterranean spaces. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of developed lands that did not contain subsurface PCEs. Any such lands that do not contain subsurface PCEs 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 that do not contain subsurface PCEs would not trigger section 7 consultations with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the PCEs in the adjacent critical habitat.

We are proposing for designation as critical habitat units that we believe were occupied at the time of listing and which contain one or more PCEs to support life-history functions essential for the conservation of the species. For some units, we did not know at the time of listing that these areas were occupied because surveys had not yet been conducted or the species had not yet been found in previous surveys. These sites not known to be occupied at the time of listing are being proposed for critical habitat because they are essential for the conservation of the species. We are not including any unoccupied areas in this rule. In addition, units are proposed for designation based on sufficient PCEs being present to support any of the nine Bexar County invertebrates' life processes. Some units contain all PCEs and support multiple life processes. Some units contain only a portion of the PCEs necessary to support one or more of the nine Bexar County invertebrates' particular use of that habitat.

Summary of Changes From Previously Designated Critical Habitat

The areas identified in this proposed rule constitute a proposed revision of the areas we designated as critical habitat for the seven Bexar County invertebrates on April 8, 2003 (68 FR 17155). The significant differences between the 2003 rule and this proposal are:

(1) This proposed rule, which is based partly on new occupancy information since we originally proposed critical habitat (Service 2008, pp. D–4–D–12; J. Krejca, Zara Environmental Consultants,

pers. comm., 2010; K. White, SWCA Environmental Consultants, pers. comm. 2010), includes 35 units, totaling 6,906 ac (2,795 ha), with 13 units that were not previously designated. This proposed rule results in an increase of 5,843 ac (2,365 ha) from the currently designated critical habitat (1,063 ac in 22 units). Seven new units are being proposed around Camp Bullis. We are also proposing four new units that were previously excluded on Government Canyon State Natural Area (GCSNA).

(2) Areas where the Government Canyon Bat Cave meshweaver and the Government Canyon Bat Cave spider occur on the GCSNA were previously excluded from the 2003 final critical habitat designation (68 FR 17155; April 8, 2003). In the 2003 designation, we determined that these areas did not meet the definition of critical habitat found in section 3(5)(A)(i) of the Act because the conservation plans for the caves on GCSNA provided adequate management and protection to the level that the area did not require special management. However, the Courts have invalidated this approach. In *Center for Biological Diversity* v. *Norton* (240 F.Supp.2d 1090 (D. Ariz. 2003)), the Court stated the actual presence of a management plan shows that special management is needed. Accordingly, we have reassessed whether these areas meet the definition of critical habitat in light of the Court's ruling. We have determined these areas meet the definition of critical habitat and have included them in this proposal (*see* Proposed Critical Habitat Designation section below).

(3) This proposal critical habitat rule includes a larger subterranean area around each occupied feature than the previous final rule (68 FR 17155; April 8, 2003). In this proposed rule, we use a distance of 0.3 mi (0.5 km) from occupied features in Karst Zone 1 as a criterion to delineate critical habitat. We base this distance on the karst geology and species genetics of Bexar County karst invertebrates (White 2006, pp. 76–78) and have better information available today (*see Subsurface Environment* above). In the 2003 final rule (68 FR 17155; April 8, 2003), we did not use a similar criterion, but stated that the distance that these invertebrates go from the cave into the surrounding karst is unknown.

(4) We increased the cave cricket foraging area from 164 ft (50 m) in the 2003 final rule (68 FR 17155; April 8, 2003) to 344 ft (105 m) in this proposed rule based on the Taylor *et al.* (2005, p. 97) study. In addition, we increased the minimum vegetation area in each unit from 40 ac (16 ha) to 100 ac (40 ha) based on the Draft Bexar County Karst Invertebrate Recovery Plan (2008, p. B–7). We use a combination of woodland, grassland, and a buffer area to protect against edge effects in this proposed rule.

(5) We are proposing as critical habitat all occupied sites for the nine Bexar County invertebrates except those that meet the criteria for exemption, as all of these sites are essential to the conservation of the species.

Proposed Critical Habitat Designation

We are proposing 35 units as critical habitat for the nine Bexar County invertebrates. For comparison, we numbered the units so that they are as consistent as possible with the previous proposed and final critical habitat rules. However, there are 13 additional units. Most additional units were assigned the next highest number, but those adjacent to Camp Bullis were assigned alphanumeric designations. For example, 10a and 10b were assigned to show their relationship to the previously proposed habitat on Camp Bullis. The critical habitat areas described below constitute our current best assessment of areas that meet the definition of critical habitat for the nine Bexar County invertebrates. All units we are proposing for the nine Bexar County invertebrates were occupied at the time of listing and are still currently occupied. Table 2 lists the proposed units, occupied caves, unit ownership, and listed species in each unit.

TABLE 2—UNIT NUMBER, NAMES OF KNOWN OCCUPIED CAVES, UNIT SIZE, LAND OWNERSHIP, AND LISTED SPECIES THAT OCCUR WITHIN EACH PROPOSED CRITICAL HABITAT UNIT

Unit	Known occupied caves in unit	Size of unit in acres (hectares)	Land owner-ship type	Listed species in unit
1a	Bone Pile Cave Surprise Sink	238 ac (96 ha)	State	*R. infernalis.* *C. madla.*
1b	Government Canyon Bat Cave	178 ac (72 ha)	State	*C. vespera.* *N. microps.* *R. exilis..* *R. infernalis.*
1c	Lost Pothole	178 ac (72 ha)	State	*C. madla.*
1d	Dancing Rattler Cave Lithic Ridge Cave Hackberry Sink	349 ac (141 ha)	State	*C. madla.* *R. exilis.* *R. infernalis.*
1e	Canyon Ranch Pit* Continental Park Cave Creek Bank Cave Fat Man's Nightmare Cave* Pig Cave San Antonio Ranch Pit Scenic Overlook Cave* Tight Cave	690 ac (279 ha)	State City Private	*R. infernalis.* *R. exilis.* *B. venyivi.* *C. madla.*
1f	10K Cave	178 ac (72 ha)	State	*R. infernalis.*
2	Logan's Cave Madla's Drop Cave	252 ac (102 ha)	Private	*C. madla.* *R. exilis.* *R. infernalis.*
3	Helotes Blowhole* Helotes Hilltop Cave*	125 ac (51 ha)	Private	*C. madla.* *R. exilis.* *R. infernalis.* *B. venyivi.*

TABLE 2—UNIT NUMBER, NAMES OF KNOWN OCCUPIED CAVES, UNIT SIZE, LAND OWNERSHIP, AND LISTED SPECIES THAT OCCUR WITHIN EACH PROPOSED CRITICAL HABITAT UNIT—Continued

Unit	Known occupied caves in unit	Size of unit in acres (hectares)	Land owner-ship type	Listed species in unit
4	Kamikazi Cricket Cave	255 ac (103 ha)	Private	*R. exilis.*
	Mattke Cave			*R. infernalis.*
	Scorpion Cave			
5	Christmas Cave	117 ac (47 ha)	Private	*C. madla.*
				R. exilis.
				R. infernalis.
				B. venyivi.
6	John Wagner Ranch	105 ac (42 ha)	Private	*C. madla.*
	Cave No. 3 *		City	*R. exilis.*
				R. infernalis.
7	Young Cave No. 1	158 ac (64 ha)	Private	*R. exilis.*
8	Three Fingers Cave	471 ac (191 ha)	Private	*C. madla.*
	Hills and Dales Pit *		City	*R. infernalis.*
	Robber's Cave			*R. exilis.*
9	Mastodon Pit	286 ac (116 ha)	State	*C. madla.*
	Feature No. 50		Private	*R. exilis.*
	La Cantera Cave No. 1			
	La Cantera Cave No. 2			
10a	Low Priority Cave [1]	67 ac (27 ha)	City Private	*R. infernalis.*
10b	Flying Buzzworm Cave [1]	66 ac (27 ha)	City	*R. infernalis.*
11a	Up The Creek Cave [1]	21 ac (8.5 ha)	Private	*R exilis.*
11b	Bunny Hole [1]	16 ac 6.5 ha	Private	*R. exilis.*
11c	Poor Boy Baculum Cave [1]	21 ac 8.5 ha	Private	*R exilis.*
11d	Root Toupee Cave [1]	52 ac	Private	*R. exilis.*
		21 ha		
11e	Blanco Cave	102 ac (41 ha)	Private	*R. exilis.*
12	Hairy Tooth Cave	371 ac (150 ha)	Private	*R. exilis.*
	Ragin' Cajun Cave			
13	Black Cat Cave	187 ac (76 ha)	Private	*R. exilis.*
14	Game Pasture Cave No. 1	330 ac (134 ha)	Private	*R. infernalis.*
	King Toad Cave			
	Stevens Ranch Trash Hole Cave			
15	Braken Bat Cave	339 ac (137 ha)	Private	*C. venii.*
	Isopit			*R. infernalis.*
	Obvious Little Cave			
	Wurzbach Bat Cave			
16	Caracol Creek Coon Cave	194 ac (76 ha)	Private	*R. infernalis.*
17	Madla's Cave *	114 ac (46 ha)	Private	*C. madla.*
				R. infernalis.
19	Genesis Cave	142 ac (57 ha)	Private	*R. infernalis.*
20	Robber Baron Cave	247 ac (100 ha)	Private	*T. cokendolpheri.*
				C. baronia.
21	Hornet's Last Laugh Pit	396 ac (160 ha)	City	*R. exilis.*
	Kick Start Cave		Private	
	Springtail Crevice			
22	Breathless Cave	178 ac (72 ha)	City	*C. madla.*
			Private	
23	Crownridge Canyon Cave	178 ac (72 ha)	City	*R. infernalis.*
			Private	
24	Peace Pipe Cave [1]	11 ac (4.5 ha)	Private	*R. exilis.*
25	OB3	177 ac (72 ha)	Private	*C. baronia.*
26	Max and Roberts Cave	117 ac (47 ha)	Private	*R. infernalis.*
Totals	62 caves 35 Units	6,906 ac (2,795 ha).		

* Indicates caves and associated lands managed under the La Cantera HCP.
[1]. Cave is located on Camp Bullis; proposed critical habitat is outside Camp Bullis but most likely includes mesocaverns of the cave.
Note: Area sizes may not sum due to rounding.

Table 3 shows whether the critical habitat units were known to be occupied at the time of listing. At the time of listing, we were unaware of several caves or whether some of the caves we did know about were occupied. Therefore, a "No" is listed in Table 3 for units where surveys had not yet been conducted or the species had not yet been found in previous surveys. All units are currently occupied.

TABLE 3—OCCUPANCY OF ONE OR MORE OF THE NINE BEXAR COUNTY INVERTEBRATES BY PROPOSED CRITICAL HABITAT UNITS

Unit	Known to be occupied at time of listing?	Currently occupied?
1a	Yes	Yes.
1b	Yes	Yes.
1c	Yes	Yes.
1d	Yes	Yes.
1e	No	Yes.
1f	No	Yes.
2	Yes	Yes.
3	Yes	Yes.
4	Yes	Yes.
5	Yes	Yes.
6	Yes	Yes.
7	Yes	Yes.
8	Yes	Yes.
9	Yes	Yes.
10a	Yes	Yes.
10b	Yes	Yes.
11a	Yes	Yes.
11b	Yes	Yes.
11c	Yes	Yes.
11d	No	Yes.
11e	No	Yes.
12	Yes	Yes.
13	Yes	Yes.
14	Yes	Yes.
15	Yes	Yes.
16	Yes	Yes.
17	Yes	Yes.
19	Yes	Yes.
20	Yes	Yes.
21	No	Yes.
22	No	Yes.
23	No	Yes.
24	No	Yes.
25	No	Yes.
26	No	Yes.

Table 4 shows the units and total area of proposed critical habitat for each of the nine Bexar County invertebrates.

TABLE 4—UNIT NUMBER AND TOTAL AREA OF PROPOSED CRITICAL HABITAT FOR EACH OF THE NINE BEXAR COUNTY INVERTEBRATES

Listed species	Critical habitat unit(s)	Total area of critical habitat acres (hectares)
R. exilis (ground beetle, no common name)	1b, 1d, 1e, 2, 3, 4, 5, 6, 7, 8, 9, 11a, 11b, 11c, 11d, 11e, 12, 13, 21, 24.	4,163 ac (1,684 ha).
R. infernalis (ground beetle, no common name)	1a, 1b, 1d, 1e, 1f, 2, 3, 4, 5, 6, 8, 10a, 10b, 14, 15, 16, 17, 19, 23, 26.	4,505 ac (1,823 ha).
Helotes mold beetle (*B. venyivi*)	1e, 3, 5	932 ac (377 ha).
Cokendolpher Cave harvestman (*T. cokendolpheri*)	20	247 ac (100 ha).
Robber Baron Cave meshweaver (*C. baronia*)	20, 25	424 ac (172 ha).
Madla Cave meshweaver (*C. madla*)	1a, 1c, 1d, 1e, 2, 3, 5, 6, 8, 9, 17, 22.	3,103 ac (1,256 ha).
Braken Bat Cave meshweaver (*C. venii*)	15	339 ac (137 ha).
Government Canyon Bat Cave meshweaver (*C. vespera*)	1b	178 ac (72 ha).
Government Canyon Bat Cave spider (*N. microps*)	1b	178 ac (72 ha).

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the nine Bexar County invertebrates below.

Unit 1a

We are proposing to designate 238 ac (96 ha) of State-owned land in Unit 1a located in northwestern Bexar County in the northwestern part of Government Canyon State Natural Area (GCSNA) in the Government Canyon KFR for the Madla Cave meshweaver and *R. infernalis*. The GCSNA is an area of

approximately 8,622 ac (2,688 ha) owned and managed by the Texas Parks and Wildlife Department (TPWD). The GCSNA is accessible to the public under certain restrictions. This unit is all undeveloped native woodland and is crossed by a wet weather stream and a trail. Unit 1a contains Surprise Sink Cave, which is occupied by Madla Cave meshweaver and *R. infernalis,* and Bone Pile Cave, which is occupied by *R. infernalis.* The Surprise Sink Cave may also be occupied by Government Canyon Bat Cave spider, but the specimen collected has not been confirmed (Zara 2010, p. 2). The caves in this unit were occupied at the time of listing, and the unit contains all the PCEs for the species.

The main threat in this unit is infestation of fire ants. The GCSNA currently has a management plan in place that includes treating for fire ants and managing for the benefit of the Madla Cave meshweaver and *R. infernalis.*

The unit was delineated by drawing a radius of 0.3 mi (0.5 ha) around each of the two caves and connecting the edges of the overlapping circles. Unit 1a is all Karst Zone 1.

Unit 1b

In Unit 1b, we are proposing 178 ac (72 ha) of State-owned land located in northwest Bexar County in the western portion of the GCSNA in the Government Canyon KFR for the Government Canyon Bat Cave meshweaver, Government Canyon Bat Cave spider, *R. exilis,* and *R. infernalis.* Land within the proposed unit consists of undeveloped native vegetation. However, there are several one-lane gravel roads that serve primarily as pedestrian trails within the State natural area. A small portion of the vegetation appears to have been cleared for ranching prior to TPWD ownership. The unit contains one cave, Government Canyon Bat Cave, which is the only known cave occupied by the Government Canyon Bat Cave meshweaver. The cave is also occupied by Government Canyon Bat Cave spider, *R. exilis,* and *R. infernalis.* The Government Canyon Bat Cave was occupied at the time of listing, and the unit contains all the PCEs.

The main threat to species in this unit is infestation of fire ants. While GCSNA currently has a management plan in place that includes treating for fire ants and managing for the benefit of the species.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave. The unit is all Karst Zone 1.

Unit 1c

We are proposing 178 ac (72 ha) of State-owned land in Unit 1c located in northwestern Bexar County in the central part of GCSNA in the Government Canyon KFR for the Madla Cave meshweaver. This unit is primarily undeveloped native woodland that is crossed by a hiking trail. There is only one cave in this unit, Lost Pothole Cave. The cave was occupied at the time of listing, and the unit contains all the PCEs for the species. A small amount of the woody vegetation in this unit has been cleared in the past for ranching prior to TPWD ownership.

The main threat to the cave is infestation of fire ants. While GCSNA currently has a management plan in place that includes treating for fire ants and managing for the benefit of the species.

This unit was delineated by drawing a 0.3-mi (0.5-km) radius around the cave. The entire unit is Karst Zone 1.

Unit 1d

In Unit 1d, we are proposing 349 ac (141 ha) of State-owned land located in northwestern Bexar County in the central part of the GCSNA in the Government Canyon KFR for the Madla Cave meshweaver, *R. exilis,* and *R. infernalis* . This unit is wooded and undeveloped. The unit is primarily native vegetation, but small portions of the unit appear to have been thinned in the past for ranching prior to TPWD ownership. Unit 1d contains three caves: Dancing Rattler Cave, Lithic Ridge Cave, and Hackberry Sink. The Lithic Ridge Cave is occupied by Madla Cave meshweaver, *R. exilis,* and *R. infernalis.* The Dancing Rattler Cave and Hackberry Sink are occupied by *R. infernalis.* The caves in this unit were occupied at the time of listing and contain all the PCEs for the species.

The main threat to the unit is infestation of fire ants, but the GCSNA currently has a management plan in place that includes treating for fire ants.

This unit was delineated by drawing a 0.3-mi (0.5-km) radius around each of the three caves and connecting the edges of the overlapping circles. The entire unit is Karst Zone 1.

Unit 1e

We are proposing 690 ac (279 ha) in Unit 1e in northwestern Bexar County that includes the northeastern part of State-owned GCSNA, adjacent City of San Antonio-owned land, and private land in the Government Canyon KFR for the Madla Cave meshweaver, *R. infernalis, R. exilis,* and Helotes mold beetle. The majority of Unit 1e consists of undeveloped land with the exception of several small private and/or county roads. Woody vegetation has been thinned for ranching on a small area of the northeastern part of the unit. Unit 1e contains eight caves. Four caves are occupied by Madla Cave meshweaver (Fat Man's Nightmare Cave, Pig Cave, San Antonio Ranch Pit, and Scenic Overlook Cave). Fat Man's Nightmare Cave is also occupied by *R. infernalis;* Pig Cave is also occupied by *R. infernalis* and *R. exilis;* San Antonio Ranch Pit is occupied by *R. infernalis, R. exilis,* and Helotes mold beetle; and Scenic Overlook Cave is occupied by *R. infernalis* and Helotes mold beetle. The unit also contains Canyon Ranch Pit and Continental Park Cave, which are occupied by *R. infernalis,* Creek Bank Cave occupied by *R exilis,* and Tight Cave occupied by *R. exilis* and Helotes mold beetle. It is not known if the caves were occupied at the time of listing, but they currently are, and the unit contains all the PCEs for the species.

The major threats to the unit are infestation of fire ants and vandalism from unauthorized access. Five of the caves in this unit are owned by GCSNA, and they currently have a management plan in place that includes treating for fire ants and managing for the benefit of the species.

Three of the eight known occupied caves within this unit and their associated preserve lands are being considered for exclusion. The 75-ac (30-ha) Canyon Ranch Preserve, which was acquired and is managed by La Cantera under their HCP, contains Canyon Ranch Pit, Fat Man's Nightmare Cave, and Scenic Overlook Cave. According to the La Cantera HCP, these three caves and the surrounding preserve lands will be managed in perpetuity for the conservation of the species.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the eight caves and joining the edges of the overlapping circles. The entire unit is Karst Zone 1.

Unit 1f

For Unit 1f, we are proposing 178 ac (72 ha) of State-owned land in northwest Bexar County in the southeastern part of the GCSNA in the Government Canyon KFR for *R. infernalis.* The unit is entirely native woodland, but a small amount appears to have been cleared in the past for ranching prior to TPWD ownership. It contains only one cave, which is named 10k Cave. We do not know if the cave was occupied at the time of listing, but it is currently, and the unit contains all the PCEs for the species.

The major threats to Unit 1f are infestation of fire ants. The GCSNA currently has a management plan in place that includes controlling fire ants and managing for the benefit of the species.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave. The unit is all Karst Zone 1.

Unit 2

We are proposing 252 ac (102 ha) of private land in Unit 2 located in northwestern Bexar County north of Bandera Road and southeast of High Bluff Road in the Helotes KFR for Madla Cave meshweaver, *R. infernalis,* and *R. exilis.* This unit contains a mix of large, wooded tracts with several residential buildings, cleared areas, a quarry on the southeastern edge, and private or county roads. The entire unit is private land.

Unit 2 contains two caves. The Madla's Drop Cave is occupied by Madla Cave meshweaver and *R. infernalis.* This unit also contains Logan's Cave, which is occupied by *R. infernalis* and *R. exilis.* These caves were occupied at the time of listing, and parts of the unit contain all the PCEs for the species. There are two paved roads that cross the cave cricket foraging area of this unit and act as barriers to cricket movement.

This unit requires special management because of residential development. Threats include the potential for destruction of habitat from vandalism, contamination of the subsurface drainage area of the unit, drying of karst, reduction of nutrient input, and infestation of fire ants.

This unit was delineated constructing a 0.3-mi (0.5-km) radius around each of the two caves and connecting the edges of the overlapping circles. Areas of Karst Zone 3 karst along the western, northwestern, and southern portions of the unit were removed in order to substantially reduce fragmentation of the unit. The rest of Unit 2 is Karst Zone 1.

Unit 3

For Unit 3, we are proposing 125 ac (51 ha) of private land in northwestern Bexar County, east of Bandera Road and northwest of Scenic Loop in the Helotes KFR for the Madla Cave meshweaver, *R. infernalis, R. exilis,* and Helotes mold beetle. The unit contains relatively large, wooded tracts. This unit contains two caves, Helotes Blowhole and Helotes Hilltop. The Helotes Blowhole is occupied by Madla Cave meshweaver, *R. infernalis,* and *R. exilis.* The Helotes Hilltop Cave is occupied by Madla Cave meshweaver, *R. exilis,* and Helotes mold beetle. Both caves were occupied at the time of listing, and the unit contains all the PCEs for the species.

Threats include the potential for destruction of habitat from vandalism, contamination of the subsurface drainage area of the unit, and infestation of fire ants. In addition, the land along the northern side of the unit has been developed with residential homes. Unit 3 contains several small residential roads and is crossed by Bandera Road, a four-lane divided highway, in its southwestern corner. This unit does not include the entire 344-ft (105-m) cave cricket foraging area around Helotes Hilltop Cave in Karst Zone 3 because there is a paved road creates a barrier to cave cricket movement.

This unit was delineated by drawing a 0.3-mi (0.5-km) radius around each of the two caves and following the edge of Karst Zone 1 (Veni 2003) within the overlapping circles. Some areas of Zone 3 are included along the eastern boundary of the unit to include more of the cave cricket foraging area for Helotes Hilltop Cave. Areas of Zone 3 along all but a part of the northern portion of the unit were removed. The rest of Unit 3 is Karst Zone 1.

This unit is being considered for exclusion, because the two caves and the approximately 25 ac (10-ha) of land surrounding the caves were acquired under the La Cantera HCP. These caves and the surrounding preserve lands will be managed in perpetuity for the conservation of the species. The remainder of the unit requires special management because of the presence of roads and residential development.

Unit 4

For Unit 4, we are proposing 255 ac (103 ha) of private land in northwestern Bexar County, west of the intersection of Scenic Loop and Cross XD Road in the UTSA KFR for *R. exilis* and *R. infernalis.* Tower View Road and Cash Mountain Road cross the northern part of the unit, and Rafter S and Cross XD cross the southern part. Unit 4 contains three caves. The Kamikazi Cricket Cave is occupied by *R. exilis* and *R. infernalis.* The Mattke and Scorpion Caves are occupied by *R. infernalis.* These three caves were occupied at the time of listing, and parts of the unit contain all the PCEs for the species.

Several threats impact this unit, including the potential for destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst areas, reduction of nutrient input, and infestation of fire ants. In addition, this unit contains several residential roads, but no major roadways or highways. Lands surrounding Unit 4 consist of relatively large, residential tracts. The unit requires special management because of threats from existing and potential future residential development.

The unit was delineated by drawing a radius of 0.3-mi (0.5-km) around each of the three caves and removing most areas of Karst Zone 3 from the unit. Large portions of the northern, southern, and western edges of Karst Zone 3 inside the circle were removed. Some areas of Karst Zone 3 were included along the western, northern, and southern edges of the cave cricket protection areas of Kamikaze Cricket and Mattke Caves. The remainder of the unit is Karst Zone 1. The unit was expanded beyond the 0.3 mi (0.5 km) area to the east and south of Kamikaze Cricket Cave and to the north and east of Mattke and Scorpion Caves in order to include at least 100 ac (40 ha) of native vegetation.

Unit 5

In Unit 5, we are proposing 117 ac (47 ha) of private land in northwestern Bexar County, northwest of Cedar Crest Drive and north of Madla Ranch Road in the Helotes KFR for the *R. exilis, R. infernalis,* Helotes mold beetle, and Madla Cave Meshweaver. The unit contains a large tract of undeveloped woodland and several smaller, wooded tracts developed with homes and associated residential roads. This unit contains one cave, Christmas Cave, which is occupied by *R. exilis, R. infernalis,* Helotes mold beetle, and Madla Cave Meshweaver. The cave was occupied at the time of listing and parts of the unit contain all the PCEs for the species. However, there are homes and associated roads within the cave cricket foraging area of the cave.

The unit requires special management because of the presence of residential development and impending future development. Threats include the potential for destruction of habitat from development and vandalism, contamination of the subsurface drainage area of the unit, reduction of moisture and nutrients, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave entrance and following the edge of Karst Zone 1 within the circle. Some areas of Zone 3 are included along the southeastern boundary of the unit to include the cave cricket foraging area for Christmas Cave. The rest of Unit 5 is Karst Zone 1.

Unit 6

For Unit 6, we are proposing 105 ac (42 ha) of private and City of San Antonio-owned land located in

northwestern Bexar County, bordered to the south by Menchaca Road and to the west by Morningside Drive in the UTSA KFR for the Madla Cave meshweaver, *R. exilis,* and *R. infernalis.* Unit 6 consists primarily of large, undeveloped, woodland tracts with several smaller areas developed with homes. The John Wagner Ranch Cave No. 3 is the only cave in this unit, and it is occupied by Madla Cave meshweaver, *R. exilis,* and *R. infernalis.* The cave was occupied at the time of listing, and the unit contains all the PCEs for species.

Threats to the unit include the potential for destruction of habitat from potential future development and vandalism, contamination of the subsurface drainage area of the unit, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around John Wagner Ranch Cave No. 3 and following the general boundary of Karst Zone 1, primarily the northeastern quadrant of the circle. A portion of the cave cricket foraging and protection area in Karst Zone 3 was included in the unit. The majority of land included in Unit 6 is in Karst Zone 1. The unit was expanded slightly outside the 0.3-mi (0.5-km) radius to the northern to eastern edge of the unit in order to include a minimum of 100 ac (40 ha) of native vegetation.

The John Wagner Ranch Cave No. 3 and approximately 4 ac (1.6 ha) surrounding the cave were acquired as part of the La Cantera HCP. Therefore, the cave and surrounding preserve lands will be managed in perpetuity for the conservation of the species. This part of the unit is being considered for exclusion in the final critical habitat rule.

Unit 7

We are proposing 158 ac (64 ha) of private land in Unit 7 located in northwestern Bexar County, south of Babcock Road near the intersection of Cielo Vista Drive and Luna Vista in the UTSA KFR for *R. exilis.* The unit is largely wooded, but there is some development in the north and eastern parts of the unit. Unit 7 contains one cave known as Young Cave No. 1 and it is occupied by *R. exilis.* The cave was occupied at the time of listing, and the unit contains all the PCEs for the species.

This unit requires special management because of residential development. There is a new road, Camino del Sol, which ends east of Young Cave No. 1, and is located within the cave cricket foraging area. Also, residential homes are located on the south part of this unit in the cave cricket protection area. Other threats include the potential for destruction of habitat from vandalism and new construction, contamination of the subsurface drainage area, drying of karst features, reduction of nutrient input, and infestation of fire ants.

Unit 7 was delineated by drawing a radius of 0.3 mi (0.5 km) around Young Cave No. 1 and including the general boundary of Karst Zone 1 in the circle. A portion of the cave cricket foraging and protection area in Karst Zone 3 is included in the unit.

Unit 8

In Unit 8, we are proposing 471 ac (191 ha) of private and City of San Antonio's Medallion Park land located in northwestern Bexar County in the UTSA KFR for the Madla Cave meshweaver, *R. exilis,* and *R. infernalis.* The unit is bordered on the northwest by Kyle Seale Parkway, on the northeast by Moss Brook Drive, and on the south by Cotton Trail Lane. Some of the land is undeveloped woodland, but some areas on the edges of the unit have been developed or have been cleared for future development. This unit contains three caves: Three Fingers Cave, Hills and Dales Pit, and Robber's Cave. The Hills and Dales Pit and Robber's Cave are occupied by Madla Cave meshweaver, *R. exilis,* and *R. infernalis.* The Three Fingers Cave is occupied by *R. exilis* and *R. infernalis.* This unit was occupied at the time of listing, and portions of the unit contain all the PCEs for the species.

The southeastern, extreme southern, northeastern, and northwestern portions of this unit have been subdivided and developed with homes. Several roads cross the unit. The extreme southern portion of the unit has higher density development. Part of the unit has been developed with residential roads, but it currently contains no homes. Threats in this unit include the potential for destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features, reduction of nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the three caves and connecting the resulting overlapping circles. Unit 8 is entirely Karst Zone 1.

The Hills and Dales Pit and approximately 70 ac (28 ha) surrounding the cave have been acquired as part of the La Cantera HCP. Therefore, the cave and surrounding preserve lands will be managed in perpetuity for the conservation of the species. This area is being considered for exclusion from the final critical habitat rule.

Unit 9

For Unit 9, we are proposing 286 ac (116 ha) of State and private land in north-central Bexar County on both sides of Loop 1604 and east of the Loop 1604 intersection with IH 10 in the UTSA KFR for the Madla Cave meshweaver and *R. exilis.* There is a large tract of undeveloped woodland to the south and dense commercial development in the north. Also, this unit has a major shopping mall in the northwestern area. The unit is bordered to the west by the University of Texas at San Antonio campus and to the east by commercial development. Unit 9 contains four caves: Mastodon Pit, Feature No. 50, La Cantera Cave No. 1, and La Cantera Cave No. 2. La Cantera Cave No. 1 is occupied by Madla Cave meshweaver and *R. exilis.* Feature No. 50 is occupied by Madla Cave meshweaver. The two other caves, Mastodon Pit and La Cantera Cave No. 2, contain only *R. exilis.* All four caves were occupied at the time of listing, and the southern part of the unit has all of the PCEs for the species. Most of the northern part of the unit does not contain the PCE of a healthy surface community of native plants and animals. We are proposing it on the basis that it contains the PCE of karst-forming rock containing subterranean spaces.

Because of the commercial development and roadways that border and cross the unit, Unit 9 requires special management. Threats include the potential for destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover, reduction of nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the four caves and connecting the resulting overlapping circles. The majority of the land included in Unit 9 is Karst Zone 1.

Unit 10a

We are proposing 67 ac (27 ha) of private and City of San Antonio's Eisenhower Park land in Unit 10a located in north central Bexar County outside the easternmost portion of the southern boundary of Camp Bullis (a military reservation) in the Stone Oak KFR for *R. infernalis.* The eastern part of the unit is in the City of San Antonio's Eisenhower Park, which is used for picnicking, camping, hiking, jogging, and nature study. The

remainder of the unit is in private ownership. The unit is almost entirely undeveloped, but contains some unpaved roads and hiking trails. This unit was occupied at the time of listing, and contains all the PCEs of the species.

The Low Priority Cave is located on Camp Bullis and contains *R. infernalis.* However, the Low Priority Cave's entrance is not included in the unit (since it is exempt under section 4(a)(3) of the Act; *see* Exemptions below), but its drainages are included in this unit.

The unit requires special management because of human use of the park and possible future development on private land and the presence of trails and a secondary roadway in the unit. Threats include the potential for destruction of surface vegetation, contamination of the subsurface drainage area of the unit, and infestation of fire ants.

Unit 10a was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave entrance and removing the portion of the circle within Camp Bullis. Camp Bullis was removed according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). The unit is all Karst Zone 1.

Unit 10b

In Unit 10b, we are proposing 66 ac (27 ha) of the City of San Antonio's Eisenhower Park in north-central Bexar County, east of Unit 10a and along the southern boundary of Camp Bullis in the Stone Oak KFR for *R. infernalis.* The unit is mostly wooded and is entirely in the City of San Antonio's Eisenhower Park. The Flying Buzzworm Cave, which contains *R. infernalis,* is located on Camp Bullis. An immature blind *Cicurina* has been collected from the cave, but has not been identified to species. The cave was occupied at the time of listing. Unit 10b contains the PCEs for the species.

The unit requires special management because of human use of the park and the presence of trails and a secondary roadway in the unit. Threats include the potential for destruction of surface vegetation, contamination of the subsurface drainage area of the unit, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave entrance and removing the portion of the circle within Camp Bullis according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). Therefore, the Flying Buzzworm Cave's entrance is not included in the unit, but its drainages and mesocaverns are. A small area of Karst Zone 2 was also removed because it was not in the cave cricket foraging area. Unit 10b contains part of its cave cricket foraging area and contiguous Karst Zone 1.

Unit 11a

We are proposing 21 ac (8.5 ha) of private land in Unit 11a in north-central Bexar County, outside the southern boundary of Camp Bullis, and southeast of Wilderness Road in the Stone Oak KFR for *R. exilis.* This unit is primarily undisturbed native vegetation. An unnamed road borders the unit on the northern boundary and crosses it close to its western edge. Two buildings are located in the northeastern and northwestern corners of the unit. Up the Creek Cave is located on adjacent Camp Bullis and contains *R. exilis.* The cave was occupied at the time of listing, and the unit contains all the PCEs for the species.

The unit requires special management because of the potential for trespassing and future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave and including all Karst Zone 1 outside of Camp Bullis in the resulting circle. Camp Bullis was removed according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). The southwest portion along the edge of the circle was not included because it is Karst Zone 2. Even though the cave's entrance is not included in this unit, its drainages and mesocaverns are. The resulting unit is all Karst Zone 1.

Unit 11b

We are proposing 16 ac (6.5 ha) of private land in Unit 11b in north-central Bexar County in the Stone Oak KFR for *R. exilis.* The unit is outside the southern boundary of Camp Bullis and is east of unit 11a. There are two small, cleared areas about 0.5 ac (0.2 ha) in size along the northern unit border, and vegetation appears to have been thinned in parts of the unit in the past. The unit is bordered on the north by an unnamed road. A cave called Bunny Hole, which is on adjacent Camp Bullis, is occupied by *R. exilis.* The cave was occupied at the time of listing, and the unit contains all of the PCEs for the species.

The unit requires special management because of the potential for future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave and including all Karst Zone 1 outside of Camp Bullis according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). The unit is all Karst Zone 1.

Unit 11c

We are proposing 21 ac (8.5 ha) of private land in Unit 11c outside the eastern boundary of Camp Bullis in north-central Bexar County in the Stone Oak KFR for *R. exilis.* Unit 11c contains a small amount of native vegetation and is crossed by Blanco Road along its western edge, a major north-south thoroughfare, and by Wilderness Oak and Ranch Oak Roads that cross the unit from east to west. The southern part of the unit has some commercial development. Poor Boy Bacculum Cave on adjacent Camp Bullis contains *R. exilis.* The cave was occupied at the time of listing. A portion of the unit has the surface PCEs for the species, but most of the unit contains only the PCE of subterranean karst-forming rock.

The unit requires special management because of the presence of existing roadways and commercial development and potential future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious and water diversion, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave and including all Karst Zone 1 outside of Camp Bullis according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). Unit 11c is all Karst Zone 1.

Unit 11d

In Unit 11d, we are proposing 52 ac (21 ha) of private land located outside the eastern boundary of Camp Bullis in north-central Bexar County in the Stone Oak KFR for *R. exilis.* Unit 11d contains some landscaped areas, but it is crossed by Blanco Road on its western edge and by Goldcrest Run, a road parallel to Blanco Road and slightly to the east. Unit 11d contains a substantial amount of commercial development and a large parking lot. The unit does contain the first two PCEs, and has a few landscaped areas with some with trees,

but does not contain the PCE of healthy native surface vegetation. The Root Toupee Cave, which is on adjacent Camp Bullis, contains *R. exilis.* We do not know if the cave was occupied at the time of listing, but it currently is. We are proposing it as critical habitat in order to provide protection for the mesocaverns and other subsurface features.

The unit requires special management because of due to the presence of existing roadways, commercial development, and potential future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover and storm water diversion, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave and including all Karst Zone 1 outside of Camp Bullis according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). Unit 11d is entirely Karst Zone 1.

Unit 11e

In Unit 11e, we are proposing 102 ac (41 ha) of private land outside the eastern boundary of Camp Bullis in north-central Bexar County for *R. exilis.* Unit 11e contains a substantial amount of residential development with landscaped areas and is crossed by Blanco Road on its western edge, Cardigan Chase Road near its eastern edge, and Calico Chase Road across most of its central portion. Blanco Cave, located in the Blanco Road right-of-way, contains *R. exilis.* The cave was occupied at the time of listing, and only the area within Camp Bullis, which is being exempted, contains all the PCEs for the species.

The unit requires special management because of the presence of existing roadways, commercial development, and potential future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3mi (0.5 km) around the cave and including all Karst Zone 1 outside of Camp Bullis within the resulting circle. Camp Bullis was exempted according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). Because it did not meet the criteria for delineating critical habitat, an area of Zones 2 and 3 was removed from the northern part of the arc. The portion of the circle within Camp Bullis (west of the unit) contains the PCE of healthy native surface vegetation. The unit is all Karst Zone 1.

Unit 12

In Unit 12, we are proposing 371 ac (150 ha) of private land in north-central Bexar County, east of the intersection of U.S. Highway 281 and Evans Road in the Stone Oak KFR for *R. exilis.* The unit is bordered to the east by U.S. Highway 281, to the south by a quarry and to the west by a school and some residential development. Evans Road, another major roadway, crosses the north central part of the unit. With the exception of a U.S. 281 and its right of way and a small amount of floodway in the western portion and part of a middle school, the unit is in private ownership. Most of the unit has been developed as a single-family homes subdivision. The unit also includes some commercial development in the northeast portion. However, small amounts of undeveloped land are located in the southern, northern, and northwestern part of the unit.

Unit 12 contains the Hairy Tooth and Ragin' Cajun Caves, which are occupied by *R. exilis.* Both caves were occupied at the time of listing. This unit does contain the first two PCEs, but most of Unit 12 does not contain the PCE of a healthy surface native plant community near to the occupied caves. The cave cricket foraging areas are impacted by houses and streets. However, this area has been delineated to protect mesocaverns and other subsurface features that are necessary for the conservation of the species.

The unit requires special management because of the commercial development and roadways that border the unit. Threats include the potential for destruction of habitat from vandalism, future development, operation of a quarry, contamination of the subsurface drainage area of the unit, karst drying, reduction of nutrient input, and infestation of fire ants.

Unit 12 was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the two caves and joining the edges of the two overlapping circles. A portion of the extreme southern area was removed from the unit because it contains an active quarry which has removed some of the karst, as the karst is covered only by a thin layer of soil in Karst Zone 1. The area to the north and northeast was expanded outside the 0.3 mi radius to include at least 100 ac (40 ha) of vegetation, necessary for units in areas with high surface impacts, as described in the *Criteria Used To Identify Critical Habitat* section above. All of Unit 12 is Karst Zone 1.

Unit 13

In Unit 13, we are proposing 187 ac (76 ha) of developed and undeveloped private land located in northeastern Bexar County in the Stone Oak KFR with the intersection of Bulverde Road and Ridgeway Drive at the middle of its northern edge for *R. exilis.* This unit contains one cave named Black Cat Cave. The cave was occupied by *R. exilis* at the time of listing, and part of the unit contains all the PCEs for the species. The cave opening is a short distance Bulverde Road, which crosses its cave footprint and cave cricket foraging area. The northern part of the unit, including about half of the cave cricket foraging area and protection area, is developed with dense residential development west of Bulverde Road, and a lower density subdivision to the east. Bulverde Road, a major two-lane roadway, crosses the middle of the unit from north to south. The southern part of the unit on both sides of Bulverde road is undeveloped. The southeastern part of the unit was expanded slightly to include at least 100 ac (40 ha) of native vegetation.

This unit requires special management because of residential development and roadways. Threats include the potential for destruction of habitat from vandalism, operation of a quarry, potential future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover and storm water diversion, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave. Additional undeveloped land was added to the unit outside the southeastern edge to include at least 100 ac (40 ha) of surface vegetation, necessary for units in areas with high surface impacts, as described in the *Criteria Used To Identify Critical Habitat* section above. All of Unit 13 is Karst Zone 1.

Unit 14

In Unit 14, we are proposing 330 ac (134 ha) of private land in western Bexar County, west of the end of Louis Agusta Drive in the Culebra Anticline KFR for *R. infernalis.* The unit includes several large tracts of undeveloped woodland. There is a major roadway, Stevens Parkway, in this unit, and it is in the process of being extended from the southwestern to western part of the unit. Some of the vegetation has been

cleared in the past for ranching. Three caves occur in this unit: Game Pasture Cave No. 1, Stevens Ranch Trash Hole Cave, and King Toad Cave. All three caves are known to contain *R. infernalis* and all were occupied at the time of listing. This unit contains all the PCEs of the species.

The unit requires special management because of potential future residential and commercial development and trespassing. Threats include the potential for destruction of surface vegetation and karst habitat, contamination of the subsurface drainage area of the unit, drying of karst features, reduction of nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the three caves and connecting the edges of the resulting overlapping circles. Unit 14 is all Karst Zone 1.

Unit 15

In this unit, we are proposing 339 ac (137 ha) of private land located in western Bexar County, west of Talley Road and north of Farm to Market Road 1957 in the Culebra Anticline KFR for the Bracken Bat Cave meshweaver and *R. infernalis.* The majority of the lands within Unit 15 are within a subdivision, and all are privately owned. Tracts in the subdivision are relatively large and still contain wooded vegetation, but there is some high-density residential development in the eastern part of the unit. Some native vegetation remains in this unit, but the cave cricket foraging areas around all of the occupied caves have been fragmented by roads and houses. A substantial amount of the vegetation appears, from the examination of aerial photographs, to be nonnative landscaped grasses. This unit contains four caves: Braken Bat Cave, Isopit, Obvious Little Cave, and Wurzback Bat Cave. Bracken Bat Cave is the only one that contains the Bracken Bat Cave meshweaver. All four caves are known to contain *R. infernalis* and all were occupied at the time of listing. The undeveloped parts of this unit contain all the PCEs for the species.

The unit requires special management because of the proximity of development, the potential for destruction of habitat from vandalism, and the lack of a healthy surface community of plants and animals. Threats include potential future development, contamination of the subsurface drainage area of the unit, drying of karst, reduction of nutrient input, and infestation of fire ants.

This unit was delineated to encompass a 0.3 mi (0.5 km) area around each of the four caves and connecting the edges of the overlapping circles. All of Unit 15 is Karst Zone 1.

Unit 16

In Unit 16, we are proposing 194 ac (79 ha) of private land in western Bexar County in the Culebra Anticline KFR for *R. infernalis.* The Unit contains several large, primarily undeveloped tracts of woodland. However, Loop 1604, a major highway, bisects the eastern part of the unit. A high-density residential subdivision is in the eastern part of the unit, and a quarry is within the southern portion. With the exception of Loop 1604 and its cleared right-of-way, most of the remainder of the unit is vegetated. But, some vegetation in the northern and northwestern part of the unit has been removed for livestock grazing. The Caracol Creek Coon Cave is the only cave in this unit and it is occupied by *R. infernalis.* The unit was occupied at the time of listing, and part of the unit contains all the PCEs for the species. However, part of the cave's footprint is under Loop 1604, and the highway has impacted parts of the cave cricket foraging and protection areas.

The unit requires special management because of the proximity of roads, existing and potential future development. Threats include potential for destruction of habitat from vandalism, quarry operation, and potential new development, contamination of the subsurface drainage area of the unit, drying of karst features, reduction of nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave. The unit was expanded outside that distance to the west and northwest to include at least 100 ac (40 ha) of vegetation around the cave opening, necessary for units in areas with high surface impacts, as described in the *Criteria Used To Identify Critical Habitat* section above. Most of Unit 16 is Karst Zone 1, except a small part of Karst Zone 2 on its western edge.

Unit 17

In Unit 17, we are proposing 114 ac (46 ha) of private land in northwest Bexar County east of Scenic Loop Road and south of Madla Ranch Road in the Helotes KFR for the Madla Cave meshweaver and *R. infernalis.* The unit contains some houses and paved roads in the eastern portion, and one house in the southeastern portion. The unit contains one cave called Madla's Cave, which is occupied by Madla Cave meshweaver and *R. infernalis.* The cave was occupied at the time of listing, and the unit has all the PCEs of the species.

Madla's Cave and the surrounding approximately 5 ac (2 ha) has been acquired in accordance with the La Cantera HCP, which also requires that the cave and the surrounding preserve lands be managed in perpetuity for the conservation of the species. We are considering excluding this area under section 4(b)(2) of the Act because it falls under the La Cantera HCP. The remainder of the unit requires special management because of the presence of residential development and potential future development within the unit. Threats include the potential for destruction of habitat from new development and vandalism, contamination of the subsurface drainage area of the unit from future development, reduction of moisture and nutrient input, and infestation of fire ants.

The unit was delineated by drawing a a radius of 0.3 mi (0.5 km) around the cave and removing areas that are not Karst Zone 1 from the northern and southwestern parts of the resulting circle. However, some areas of Karst Zone 3 were left in the unit to encompass the cave cricket protection area and to reduce edge effects.

Unit 19

In Unit 19, we are proposing 142 ac (57 ha) of private land in north-central Bexar County near the intersection of Stone Oak Road and Loop 1604 in the Stone Oak KFR for *R. infernalis.* The majority of the unit has been developed for residential and/or commercial uses. The eastern part of Unit 19 is crossed by Stone Oak Road. Several other minor roadways and parking lots are scattered through the unit, and part of a golf course is in the northwestern section of the unit. There are some trees left in a neighborhood in the northern part of the unit, and a few trees are on the golf course. In addition, there is some landscaped grass surrounding Genesis Cave, the only cave in this unit. This cave is occupied by *R. infernalis.* The cave was occupied at the time of listing, but the unit does not contain the PCE of a healthy surface community of native plants and animals. However, we delineate this unit as it contains the first two PCEs, and in order to protect the mesocaverns and other subsurface karst features that are occupied.

The unit requires special management because of the high levels of residential and commercial development and high impervious cover within the unit. Threats include the potential for destruction of habitat from vandalism and future development, contamination of the subsurface drainage area of the unit, drying of karst features from

impervious cover and storm water diversion, reduced nutrient input, and infestation of fire ants.

The unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave entrance and removing areas that are not Karst Zone 1 from the southern and eastern parts of the unit. The unit is all Karst Zone 1.

Unit 20

In Unit 20, we are proposing 247 ac (100 ha) of private land located in north-central part of the City of San Antonio, south of Loop 410 West, and primarily along Nacogdoches Road northeast of Broadway in the Alamo Heights KFR for the Cokendolpher cave harvestman and Robber Baron Cave meshweaver. This unit contains one known occupied cave, Robber Baron Cave, which is the only known cave for the Cokendolpher cave harvestman. It is also one of only two caves known to be occupied by Robber Baron Cave meshweaver (OB3 in Unit 25 is the other cave). The Robber Baron Cave was occupied at the time of listing and is the longest cave in Bexar County, consisting of approximately 0.9 mi (1.5 km) of passages (Veni 2003, p. 19). The estimated footprint of the cave now underlies numerous residential and commercial developments. The Texas Cave Management Association (TCMA), a non-profit organization dedicated to the study and management of Texas cave resources, now owns and manages the cave and about 0.5 ac (0.2 ha) surrounding the opening.

The unit was occupied at the time of listing; however, surface vegetation within Unit 20 has been significantly reduced and degraded by urban development, and the only PCE remaining is karst-forming rock containing subterranean spaces. Lands within this unit do not contain the physical and biological features of a healthy surface community of native vegetation or of surface water free of pollutants. The unit requires special management because of the high levels of residential and commercial development within the unit. Threats include the potential for destruction of habitat from vandalism, soil compaction from cave visitation, lack of a healthy community of native plants and animals, contamination of the subsurface drainage area of the unit, drying of karst, and infestation of fire ants. Because of the extensive development, high levels of impervious cover, and diversion of storm water over the cave, intensive management may be needed to provide nutrients and water to the karst environment.

The unit was delineated to encompass the estimated extent of the cave's surface and subsurface drainage and all of the contiguous Karst Zone 1.

Unit 21

We are proposing 396 ac (160 ha) of private and City of San Antonio-owned land in Unit 21 in northeast Bexar County, northeast of the intersection of Evans Road and Stone Oak Parkway for *R. exilis.* The unit contains several large tracts of undeveloped land and several smaller tracts developed with homes and residential roads. Mud Creek runs through the unit, and part of Unit 21 is the pool area of a flood control reservoir owned by the City of San Antonio. The rest of the unit is in private ownership. Vegetation in the flood pool area is modified by periodic inundation and/or mechanical control by the City of San Antonio. The northern and northeastern part of the unit has dense residential development, while there is less dense development in the western portion. The southeastern corner of the unit also has a small amount of residential development. Unit 21 contains three caves: Hornet's Last Laugh Pit, Kick Start Cave, and Springtail Crevice. All are currently occupied by *R. exilis,* but they were not known to be occupied at the time of listing. Parts of the unit contain all the PCEs for the species.

The unit requires special management because of residential development, roadways, and potential for new construction in the unit. Threats include the potential for destruction of habitat from vandalism, operation of a quarry, and potential future development, contamination of the subsurface drainage area of the unit, altered karst features from stormwater retention, reduced nutrient input, and infestation of fire ants.

Unit 21 was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the three caves and joining the edges of the three overlapping circles. The entire unit is Karst Zone 1. One of three caves (Springtail Crevice) is located in the pool area of a flood control reservoir, and its surface drainage basin covers the entire watershed of Mud Creek upstream of the cave, which includes 5,675 ac (2,297 ha) of land and extends about 4.3 mi (6.9 km) upstream. We included a portion of the watershed beyond the normal 0.3 mi (0.5 mi) distance used to delineate units, in order to include stream drainage that could provide the moisture necessary to provide humidity to the cave and its connected mesocaverns, but we did not include the entire surface drainage area for the unit, as it is so large and extends so far from the cave and its mesocaverns. The extra area included extends in contiguous Karst Zone 1 up the drainage basin about 0.5 mi (0.8 km) outside of the 0.3 mi (0.5 km) distance and adds approximately 68 ac (28 ha) to the area of the unit. The proposed unit designation includes about seven percent of the entire surface watershed.

Unit 22

In Unit 22, we are proposing 178 ac (72 ha) of private and City of San Antonio's Woodland Hills land located in northwestern Bexar County, northeast of Babcock Road and northwest of Heuermann Road in the UTSA KFR for the Madla Cave meshweaver. The unit is mostly vegetated, but contains a few residential sites on its extreme western border. There are several unpaved roads and trails, including one within the cave cricket foraging area. The unit is mostly undeveloped woodland, but some areas appear to have been cleared in the past for ranching. Unit 22 is a combination of private land and the City of San Antonio's Woodland Hills' property, which includes Breathless Cave, the only cave in this unit. Breathless Cave is currently occupied by Madla Cave meshweaver, but it was not known to be occupied at the time of listing. The unit contains all the PCEs for the species.

The unit requires special management because of the presence of residential development and potential future development within the unit. Threats include the potential for destruction of habitat from new development and vandalism, contamination of the subsurface drainage area of the unit from future development, reduction of moisture and nutrient input, and infestation of fire ants.

The unit was delineated by drawing a circle with a radius of 0.3 mi (0.5 km) around Breathless Cave. The resulting unit is mostly Karst Zone 1, except for a small sliver of Karst Zone 3 in the southwestern corner, which was included because of its narrow width and the increased edge effect. Adverse effects of edges include increased abundance of invasive plant and animal species. For a detailed description, refer to the sections on Edge Effects, *Special Management Considerations or Protection,* and *Criteria Used To Identify Critical Habitat.*

Unit 23

In Unit 23, we are proposing 178 ac (72 ha) of private land and City of San Antonio's Crownridge Canyon Natural Area in northwestern Bexar County northeast of Luskey road and east of the end of Fiesta Grande in the UTSA KFR for *R. infernalis.* A large portion of the unit is the City of San Antonio's Crownridge Canyon Natural Area, which is open to hiking, nature study,

and wildlife observation. Most of Unit 23 is in native woodland vegetation. The western and southwestern portion of the unit has been cleared for a residential subdivision. The clearing extends more than half way into the western portion of the Crownridge Canyon Cave's cave cricket foraging area. The Crownridge Canyon Cave is the only cave in this unit and it is occupied by *R. infernalis.* The cave was not known to be occupied at the time of listing, but part of the unit contains all the PCEs for the species.

The unit requires special management because of residential development, roadways, and potential for new construction in the unit. Threats include the potential for destruction of habitat from vandalism and future development, contamination of the subsurface drainage area of the unit, drying of karst features from impervious cover and diversion of storm water, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave. The unit is all Karst Zone 1.

Unit 24

In Unit 24, we are proposing 11 ac (4.5 ha) of private land in north-central Bexar County, but south of Vera Cruz Road in the Stone Oak KFR for *R. exilis.* The unit is composed of undisturbed, native vegetation along the western edge of Camp Bullis, which contains the Peace Pipe Cave occupied by *R. exilis.* The cave was not known to be occupied at the time of listing, but the unit contains all the PCEs for the species.

The unit requires special management because of the potential for future development. Threats include destruction of habitat from vandalism and potential future development, contamination of the subsurface drainage area of the unit, drying of karst features, reduced nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the cave and including all Karst Zone 2 outside of Camp Bullis in the resulting circle. Camp Bullis was exempted according to section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) (*see* Exemptions section, below). The habitat was classified as Karst Zone 2 by Veni (2003, pp. 10–18) because the Peace Pipe Cave was not discovered until 2009. At that time, the cave was verified by a species expert to contain *R. exilis.* An area that was Karst Zone 3 was removed from the northern portion of the circle outside Camp Bullis because it did not meet the criteria for delineating critical habitat. The rest of Unit 24 is Karst Zone 2.

Unit 25

In Unit 25, we are proposing 177 ac (72 ha) of private land located in northern part of the City of San Antonio near the intersection of Shook Avenue and East Kings Highway in the Alamo Heights KFR for the Robber Baron Cave meshweaver. This unit contains cave OB3, occupied by the Robber Baron Cave meshweaver. The cave feature was discovered during excavation in 2009, after the Robber Baron Cave meshweaver had already been listed, so it is unknown whether the cave was occupied at the time of listing. The surface habitat around this feature has been highly modified and is covered with residential and commercial development, including numerous streets. Unit 25 also contains landscaped lawns, sports fields, and residential and commercial development. The unit contains only the PCE of karst-forming rock containing subterranean spaces.

The unit requires special management because of the high levels of residential and commercial development within the unit. Threats include the potential for destruction of habitat from vandalism and potential new development, contamination of the subsurface drainage area of the unit, drying of the karst feature, reduction of nutrient input, and infestation of fire ants.

The unit was delineated by drawing a radius of 0.3 mi (0.5 km) around the feature. Because no listed species were known from this area of the Alamo Heights KFR when Karst Zones were delineated by Veni (2003), the entire unit is located in Karst Zone 2.

Unit 26

In Unit 26, we are proposing 117 ac (47 ha) of private land in western Bexar County southwest of the extension of Stevens Ranch Parkway and south of Unit 14 in the Culebra Anticline KFR for *R. infernalis.* This unit is all undeveloped land. Woody vegetation has been thinned for ranching in the eastern portion of the unit, while the western portion has been more heavily cleared. There is one cave in this unit, Max and Roberts Cave, and it currently contains *R. infernalis.* It is unknown if the cave was occupied at the time of listing. The cave has two entrances, and this unit contains all the PCEs necessary for the conservation of the species.

The unit requires special management because of potential future residential and commercial development and trespassing. Threats include the potential for destruction of surface vegetation and karst habitat from vandalism, contamination of the subsurface drainage area of the unit, drying of karst habitat, reduction of nutrient input, and infestation of fire ants.

This unit was delineated by drawing a radius of 0.3 mi (0.5 km) around each of the two cave entrances and connecting the edges of the overlapping circles. Unit 26 is primarily Karst Zone 1, but the cave cricket foraging and protection area on the western part of the unit was included even though it is Karst Zone 3.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out are 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.

Decisions by the Fifth and Ninth Circuits Court of Appeals have invalidated our definition of "destruction or adverse modification" (50 CFR 402.02) (*see Gifford Pinchot Task Force* v. *U.S. Fish and Wildlife Service,* 378 F.3d 1059 (9th Cir. 2004) and *Sierra Club* v. *U.S. Fish and Wildlife Service et al.,* 245 F.3d 434, 442 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain those PCEs that relate to the ability of the area to periodically support the species) to serve its intended conservation role for the species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, Tribal, local, or private lands that require a

Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, Tribal, local, or private lands that are not Federally funded or authorized, do not require section 7 consultation.

As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

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

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

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. 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 Director's opinion, avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat.

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

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies may sometimes need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Federal activities that may affect any of the nine Bexar County invertebrates or their designated critical habitat require section 7 consultation under the Act. Activities on State, Tribal, local, or private lands requiring a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from us under section 10 of the Act) or involving some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency) are subject to the section 7 consultation process. 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 permitted, do not require section 7 consultations.

Application of the "Adverse Modification" Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species, or retain those PCEs that relate to the ability of the area to periodically support the species. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to an extent that appreciably reduces the conservation value of critical habitat for any of the nine Bexar County invertebrates. As discussed above, the role of critical habitat is to support the life-history needs of the species and provide for the conservation of the species.

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

Activities that, when carried out, funded, or authorized by a Federal agency, may affect critical habitat and therefore should result in consultation for any of the nine Bexar County invertebrates include, but are not limited to:

(1) Actions that would result in removing, thinning, or destroying perennial surface vegetation. Such activities could include, but are not limited to, burning, wood cutting or other mechanical removal, grading, excessive livestock overgrazing, construction, road building, mining, and herbicide application. These activities could destroy or damage the native plant community and increase the number of nonnative plants and animals, including fire ants. The actions could also adversely affect cave crickets and other native animals on the surface that provide nutrients to the karst ecosystem, reduce other nutrient input (for example, leaf litter and roots), reduce water quality, reduce humidity of the cave, and change subterranean temperatures.

(2) Actions that would alter the surface topography or subsurface geology resulting in a disruption of ecosystem processes necessary to sustain the cave environment. Such activities could include, but are not limited to, filling cave entrances or otherwise reducing airflow in a way that limits oxygen availability; modifying cave entrances or creating new entrances that increase airflow in a way that results in drying of the karst features; altering natural drainage patterns, surface or subsurface, in a manner that alters the amount or quality or both of water entering the cave, karst feature, or mesocaverns; removing or disturbing native surface vegetation so that it alters the quality or quantity of water entering the karst environment; disturbing soil in such a way that it results in increased sedimentation in the karst environment or increased numbers of fire ants; increasing impervious cover that may decrease water quantity entering the karst environment or affect the temperature of karst below it or both within any critical habitat unit, such as paving over a vegetated area; and altering the entrance or opening of a cave or karst feature in a way that would disrupt movements of cave crickets or other animals that provide nutrient input or otherwise negatively altering the movement of nutrients into the cave or karst feature.

(3) Actions that would introduce pollutants to the occupied features themselves, the surface and subsurface drainage basins, or the surrounding mesocaverns. Such activities could include, but are not limited to, discharge or dumping of chemicals, silt, pollutants, household or industrial waste, pesticides or herbicides, or other harmful material into or near critical habitat units that may affect surface plant and animal communities or that

may affect the subsurface karst ecosystem or degrade subsurface water quality.

(4) Activities within caves that would lead to soil compaction, changes in atmospheric conditions, or abandonment of the cave by bats or other fauna. Such activities could include, but are not limited to, excessive human traffic, destruction of cave features, enlargement of existing entrances, or creation of new entrances to karst features.

(5) Activities that would attract or increase fire ants, cockroaches, or other invasive predators, competitors, parasites, or potential vectors for diseases into caves or karst features within the critical habitat units. Such activities could include, but are not limited to, dumping of garbage in or around caves or karst features.

Exemptions

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

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

(1) An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;

(2) A statement of goals and priorities;

(3) A detailed description of management actions to be implemented to provide for these ecological needs; and

(4) A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: "The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation."

We consult with the military on the development and implementation of INRMPs for installations with listed species. We analyzed INRMPs developed by military installations located within the range of the proposed critical habitat designation for the nine Bexar County invertebrates to determine if they are exempt under section 4(a)(3) of the Act.

Approved INRMPs

Camp Bullis Military Reservation

Camp Bullis Military Reservation (Camp Bullis) has an approved INRMP in place that provides benefits to *Rhadine exilis, R. infernalis,* and Madla Cave meshweaver. Camp Bullis is a 43.7 mi^2 (113.3 km^2) facility under the command of Fort Sam Houston, U.S. Army, Texas. The area contains 26 caves with 1 or more of the 3 listed species. After the species were petitioned for listing, Camp Bullis began karst investigations to determine the extent of these species on their property and how best to manage them. A management plan was developed in 1999 (Veni and Associates 1999) and revised in 2002 (Veni *et al.* 2002a and 2002b) to eliminate, mitigate, and prevent harm to these and other rare species on Camp Bullis in perpetuity. The Veni *et al.* 2002a and 2002b reports became part of an INRMP in 2005. The INRMP was revised in 2007 and underwent an annual review and update in 2010.

The INRMP provides for management of all caves occupied by *Rhadine exilis, R. infernalis,* and Madla Cave meshweaver. The Madla Cave meshweaver is only found in one cave within the interior of Camp Bullis. Management actions include protecting the cave footprint, surface and subsurface drainage areas associated with the occupied cave, cave cricket foraging area, and surface plant and animal community, and controlling fire ants. The plan includes in-cave biological surveys, cave gate construction, and preservation of karst management areas (KMAs) around cave entrances. The KMAs will be preserved in perpetuity within the limits possible through the authority of Camp Bullis and its operational and mission requirements. The INRMP stipulates that should Camp Bullis ever be transferred in whole or in part, local Army officials will request that the Secretary of the Army, or other appropriate authority, review and incorporate provisions from this management plan into the property disposal procedures. Those provisions would transfer responsibility for appropriate management of any former Camp Bullis karst management areas to all subsequent owners by deed recordation or other binding instrument.

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the Camp Bullis INRMP and that conservation efforts identified in the INRMP will provide a benefit to *R. exilis, R. infernalis,* and the Madla Cave meshweaver occurring in habitats within or adjacent to Camp Bullis. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including approximately 4,104 ac (1,660 ha) of habitat in this proposed revised critical habitat designation because of this exemption.

Exclusions

Application of Section 4(b)(2) of the Act

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

Under section 4(b)(2) of the Act, we may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. In considering whether to exclude a particular area from the designation, we must identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and determine whether the benefits of exclusion outweigh the benefits of inclusion. If based on this

analysis, we make this determination, then we can exclude the area only if such exclusion would not result in the extinction of the species.

When identifying the benefits of inclusion for an area, we consider the additional regulatory benefits that area would receive from the protection from adverse modification or destruction 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.

When identifying the benefits of exclusion, we consider, among other things, whether exclusion of a specific area is likely to result in conservation; the continuation, strengthening, or encouragement of partnerships; and/or implementation of a management plan that provides equal to or more conservation that a critical habitat designation would provide.

The benefits of critical habitat include public awareness of the presence of these species and the importance of habitat protection, and in cases where a Federal nexus exists, increased habitat protection for these species due to the protection from adverse modification or destruction of critical habitat.

When we evaluate the existence of a conservation plan when considering the benefits of exclusion, 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 and 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 evaluating the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to determine whether the benefits of exclusion outweigh those of inclusion. If we determine that they do, we then determine whether exclusion would result in extinction. If exclusion of an area from critical habitat will result in extinction, we will not exclude it from the designation.

Based on the information provided by entities seeking exclusion, as well as any additional public comments received, we will be evaluating whether certain lands in proposed critical habitat unit 1e, 3, 6, 8, and 17 are appropriate for exclusion from the final designation. If our analysis results in a determination that the benefits of excluding lands from the final designation outweigh the benefits of designating those lands as critical habitat, then we will exclude the lands from the final designation.

After considering the following areas under section 4(b)(2) of the Act, we are proposing to exclude them from the critical habitat designation for *R. exilis. R. infernalis,* Helotes mold beetle, and Madla Cave meshweaver: Canyon Ranch Pit; Fat Man's Nightmare Cave; Scenic Overlook Cave and associated portions of Unit 1e; Helotes Blowhole, Helotes Hilltop Cave, and portions of Unit 3 associated with these caves; Madla's Cave and portions of Unit 17 associated with it; Hills and Dales Pit and portions of Unit 8 associated with it; and John Wagner Ranch Cave No. 3 and portions of Unit 6 associated with it.

We propose to exclude these areas because we believe that:

(1) Their value for conservation will be preserved for the foreseeable future by existing protective actions, or

(2) They are appropriate for exclusion under the "other relevant factor" provisions of section 4(b)(2) of the Act.

However, we specifically solicit comments on the inclusion or exclusion of such areas. In the paragraphs below, we provide a detailed analysis of our exclusion of these lands under section 4(b)(2) of the Act.

Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we are preparing an analysis of the economic impacts of the proposed critical habitat designation and related factors.

An economic analysis conducted on the previous critical habitat designation found that the invertebrate critical habitat area is characterized by intense commercial and residential development. It stated that potential costs arising from such development were captured through quantification of technical assistance efforts for landowners regarding smaller land use activities on private properties, development of HCPs, and individual construction projects that are foreseeable over a 10-year time horizon (*e.g.,* infrastructure development at University of Texas, San Antonio, and road expansion projects). The economic analysis further stated that the economic impacts of the proposed designation will be manifested primarily through project modification costs of development-related HCPs. It estimated that project modification costs represent approximately 84 percent of the total cost of the designation and will be borne by private landowners planning to engage in commercial or large-scale residential development on their properties. The analysis found that the most costly of these modifications is the purchasing of karst preserves. The analysis further stated that the majority of the costs that are attributable solely to designation of critical habitat are expected to arise from actions taken in accordance with new information and awareness that would result from the designation.

We will announce the availability of the draft economic analysis on this revised designation of critical habitat as soon as it is completed, at which time we will seek public review and comment. At that time, copies of the draft economic analysis will be available for downloading from the Internet at *http://www.regulations.gov,* or by contacting the Austin Ecological Services Field Office directly (*see* **FOR FURTHER INFORMATION CONTACT** section). During the development of a final designation, we will consider economic impacts, public comments, and other new information, and areas may be excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

Exclusions Based on National Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense (DOD) where a national security impact might exist. Lands owned by Camp Bullis were exempted from this proposed critical habitat rule on the basis of an existing INRMP. Therefore, we anticipate no impact to national security. There are no areas proposed for exclusion based on impacts on national security.

Exclusions Based on Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts to national security. We consider a number of factors including whether the landowners have developed any HCPs or other management plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any Tribal issues, and consider the government-to-government relationship of the United

States with Tribal entities. We also consider any social impacts that might occur because of the designation.

When we evaluate the existence of a conservation plan when considering the benefits of exclusion, 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 and 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.

We will consider the La Cantera HCP and any other relevant information during the development of the final rule to determine if this area should be excluded from the final critical habitat designation under section 4(b)(2) of the Act.

The goals of the La Cantera HCP are to minimize and mitigate for the potential negative effects of constructing and operating commercial, light industrial, recreational, and residential development near and adjacent to currently occupied habitat of the endangered karst invertebrates, and to contribute to conservation of the covered species and other listed and non-listed cave or karst fauna.

The La Cantera HCP authorizes take of listed species in La Cantera Cave No. 1 and La Cantera Cave No. 2. Under the La Cantera HCP, mitigation for take within these caves was implemented by purchasing and managing eight caves known to contain one or more of the nine Bexar County invertebrates for which take was being permitted. These mitigation caves are Canyon Ranch Pit, Fat Man's Nightmare Cave, Scenic Overlook Cave and the surrounding approximately 75 ac (30 ha) within Unit 1e; Helotes Blowhole and Helotes Hilltop Caves and the surrounding approximately 25 ac (10 ha) within Unit 3; John Wagner Cave No. 3 and the surrounding approximately 4 ac (1.6 ha) within Unit 6; Hills and Dales Pit and the surrounding approximately 70 ac (28 ha) within Unit 8; and Madla's Cave and the surrounding approximately 5 ac (2 ha) within Unit 17. As part of their HCP, La Cantera is required to protect and manage these areas in perpetuity in accordance with the conservation needs of the species.

Table 5 below provides approximate areas (ac, ha) of lands that meet the definition of critical habitat but are exempt from designation under section 4(a)(3) of the Act, and lands that the Service is considering for possible exclusion from the final critical habitat rule under section 4(b)(2) of the Act.

TABLE 5—EXEMPTIONS AND AREAS CONSIDERED FOR EXCLUSION BY CRITICAL HABITAT UNIT

Unit	Specific area	Basis for exclusion/ exemption	Areas meeting the definition of critical habitat in acres (hectares)	Areas exempted or possible exclusion in acres (hectares)
1e	La Cantera HCP	4(b)(2)	690 (279)	75 (30)
3	La Cantera HCP	4(b)(2)	125 (51)	25 (10)
6	La Cantera HCP	4(b)(2)	99 (40)	4 (1.6)
8	La Cantera HCP	4(b)(2)	471 (191)	70 (28)
10	Camp Bullis	4(a)(3)	3,143 (1,273)	3,143 (1,273)
11	Camp Bullis	4(a)(3)	906 (367)	906 (367)
17	La Cantera HCP	4(b)(2)	115 (47)	5 (2)
24	Camp Bullis	4(a)(3)	55 (22)	55 (22)

A final determination on whether we should exclude any of these areas from critical habitat for any of the nine Bexar County invertebrates will be made when we publish the final rule designating critical habitat. We will take into account public comments and carefully weigh the benefits of exclusion versus inclusion of these areas. We may also consider areas not identified above for exclusion from the final critical habitat designation based on information we may receive during the preparation of the final rule (*e.g.,* management plans for additional areas).

Peer Review

In accordance with our joint policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our critical habitat designation is based on scientifically sound data, assumptions, and analyses. We have invited these peer reviewers to comment during this public comment period on our specific assumptions and conclusions in this proposed designation of critical habitat.

We will consider all comments and information we receive during this comment period on this proposed rule during our preparation of a final determination. Accordingly, the final decision may differ from this proposal.

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Required Determinations

Regulatory Planning and Review—Executive Order 12866

The Office of Management and Budget (OMB) has determined that this rule is not significant and has not reviewed this proposed rule under Executive Order 12866 (E.O. 12866). OMB bases its determination upon the following four criteria:

(1) Whether the rule will have an annual effect of $100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government.

(2) Whether the rule will create inconsistencies with other Federal agencies' actions.

(3) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients.

(4) Whether the rule raises novel legal or policy issues.

Regulatory Flexibility Act

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, whenever an agency must 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 (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 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.

At this time, we lack the available economic information necessary to provide an adequate factual basis for the required RFA finding. Therefore, we defer the RFA finding until completion of the draft economic analysis prepared under section 4(b)(2) of the Act and E.O. 12866. This draft economic analysis will provide the required factual basis for the RFA finding. Upon completion of the draft economic analysis, we will announce availability of the draft economic analysis of the proposed designation in the **Federal Register** and reopen the public comment period for the proposed designation. We will include with this announcement, as appropriate, an initial regulatory flexibility analysis or a certification that the rule will not have a significant economic impact on a substantial number of small entities accompanied by the factual basis for that determination.

In the previous proposed rule, we certified that the proposed designation of critical habitat for the nine endangered Bexar County invertebrate species would not have a significant economic impact on a substantial number of small entities and that the proposed rule did not meet the criteria under SBREFA as a major rule. Therefore, an initial regulatory flexibility analysis was not required. In summary, we reasoned that probable future land uses in the areas proposed for designation were expected to have a Federal nexus or require section 7 consultation (for example, road and utility development projects, water crossings, *etc.*). These projects may require Federal permits. In these areas, Federal involvement—and thus section 7 consultations, the only trigger for economic impact under the rule—would be limited to a subset of the area proposed. The most likely Federal involvement would be associated with activities involving the Department of Defense, Federal Highways Administration, Texas Department of Transportation, Environmental Protection Agency, U.S. Army Corps of Engineers, or the Federal Emergency Management Agency. This proposed revised rule may result in project modifications when proposed Federal activities would destroy or adversely modify critical habitat. While this may occur, it is not expected frequently enough to affect a substantial number of small entities. Even when it does occur, we do not expect it to result in a significant economic impact because we expect that most proposed projects, with or without modification, can be implemented in such a way as to avoid adversely modifying critical habitat, as the measures included in reasonable and prudent alternatives must be economically feasible and consistent with the proposed action.

The economic analysis of the previous critical habitat designation found that the invertebrate critical habitat area is characterized by intense commercial and residential development and that the economic impacts of the proposed designation would be manifested primarily through project modification costs of potentially eight development-related HCPs. The previous analysis estimated that project modification costs represent approximately 84 percent of the total cost of the designation and would be borne by private landowners planning to engage in commercial or large-scale residential development on their properties. The analysis further stated that the most costly of these modifications is the purchasing of karst preserves. At this time, only the La Cantera HCP covers take for any of the Bexar County invertebrates.

We have concluded that deferring the RFA finding until completion of the draft economic analysis is necessary to meet the purposes and requirements of the RFA. Deferring the RFA finding in this manner will ensure that we make a sufficiently informed determination based on adequate economic information and provide the necessary opportunity for public comment.

Unfunded Mandates Reform Act

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

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

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

in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule would significantly or uniquely affect small governments because critical habitat is already designated in most of the areas of Bexar County, and this proposed revision would not substantially change the impacts associated with the currently designated critical habitat. Therefore, a Small Government Agency Plan is not required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment if appropriate.

Takings

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we will analyze the potential takings implications of designating new and revised critical habitat for the nine Bexar County invertebrates in a takings implications assessment. Following completion of the proposed rule, a draft Economic Analysis will be completed for the proposed designation. The draft Economic Analysis will provide the foundation for us to use in preparing a takings implications assessment.

Federalism

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A Federalism assessment 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 in Texas. The designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical and biological features of the habitat necessary to the conservation of the species are specifically identified. This information does not alter where and what Federally sponsored activities may occur. However, it may assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

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

Civil Justice Reform

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We are proposing critical habitat in accordance with the provisions of the Act. This proposed rule uses standard property descriptions and identifies the physical and biological features within the designated areas to assist the public in understanding the habitat needs of the nine Bexar County invertebrates.

Paperwork Reduction Act of 1995

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (NEPA)

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 as defined by NEPA (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

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 the **ADDRESSES** section. 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.*

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, 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 there are no Tribal lands occupied at the time of listing that contain the features essential for the conservation, and no Tribal lands that are essential for the conservation, of the nine Bexar County invertebrates. Therefore, we are not proposing designation of critical habitat for them on Tribal lands.

Energy Supply, Distribution, or Use

On May 18, 2001, the President issued an Executive Order (E.O. 13211; Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) on regulations that significantly affect energy supply, distribution, and use. E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. We do not expect it to significantly affect energy supplies, distribution, or use. There are electric

power lines and natural gas pipelines adjacent to or within many of the proposed units. We do not believe they would be significantly affected because critical habitat is currently in place in most of the units, and this proposed revision would not substantially change that. We do not expect to significantly affect energy supplies, distribution, or use because the majority of the lands we are proposing as critical habitat occur on privately owned lands that are primarily developed for residential uses, and not energy production or distribution. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment as warranted.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Austin Ecological Services Field Office (*see* **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this package are the staff members of the Austin Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

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

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. In § 17.11(h), revise the entries for "Meshweaver, Government Canyon Bat Cave" and "Spider, Government Canyon Bat Cave" under ARACHNIDS in the List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
ARACHNIDS							
*	*	*	*	*	*		*
Meshweaver, Government Canyon Bat Cave.	*Cicurina vespera*	U.S.A. (TX)	NA	E	706	17.95(g)	NA
*	*	*	*	*	*		*
Spider, Government Canyon Bat Cave.	*Neoleptoneta microps*	*U.S.A. (TX)*	*NA*	*E*	*706*	*17.95(g)*	*NA*
*	*	*	*	*	*		*

3. Amend § 17.95 by:

a. In paragraph (g), revising the critical habitat entry for the Cokendolpher Cave Harvestman (*Texella cokendolpheri*);

b. In paragraph (g), revising the critical habitat entry for the Braken Bat Cave Meshweaver (*Cicurina venii*);

c. In paragraph (g), adding a critical habitat entry for the Government Canyon Bat Cave Meshweaver (*Cicurina vespera*) in the same alphabetical order in which the species appears in § 17.11(h);

d. In paragraph (g), revising the critical habitat entry for the Madla Cave Meshweaver (*Cicurina madla*);

e. In paragraph (g), revising the critical habitat entry for the Robber Baron Cave Meshweaver (*Cicurina baronia*);

f. In paragraph (g), adding a critical habitat entry for the Government Canyon Bat Cave Spider (*Neoleptoneta microps*) in the same alphabetical order in which the species appears in § 17.11(h);

g. In paragraph (i), revising the critical habitat entry for the Helotes Mold Beetle (*Batrisodes venyivi*);

h. In paragraph (i), revising the critical habitat entry for the Beetle (no common name) (*Rhadine exilis*); and

i. In paragraph (i), revising the critical habitat entry for the Beetle (no common name) (*Rhadine infernalis*), to read as follows.

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(g) *Arachnids.*

Cokendolpher Cave Harvestman (*Texella cokendolpheri*)

(1) Critical habitat for the Cokendolpher Cave harvestman in Bexar County, Texas, occurs in Unit 20 as described in this entry and depicted on Map 1 (index map) and Map 2 in this entry.

(2) The primary constituent elements of critical habitat for the Cokendolpher Cave harvestman are:

(i) Karst-forming rock containing subterranean spaces (caves and connected mesocaverns) with stable temperatures, high humidities (near saturation), and suitable substrates (for example, spaces between and underneath rocks for foraging and sheltering);

(ii) Surface water free of pollutants that flows into the karst features. Sources may include surface runoff that flows directly into the caves' entrances, or water that flows through associated features, such as sinkholes and fractures known to connect to the karst features, or water that flows through the connected subsurface drainage area, which consequently allows water to flow into caves and passages; and

(iii) A healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) living near the karst

feature that provides nutrient input and protects the karst ecosystem from adverse effects (for example, from nonnative species invasions, contaminants, and fluctuations in temperature and humidity).

(3) Developed lands (residential or commercial) that do not contain the subsurface primary constituent element (*see* subparagraph (2)(i) of this entry) and that existed on the effective date of this rule are not considered to be critical habitat.

(4) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(5) Index Map of Bexar County invertebrates critical habitat units, Bexar County, Texas, follows.

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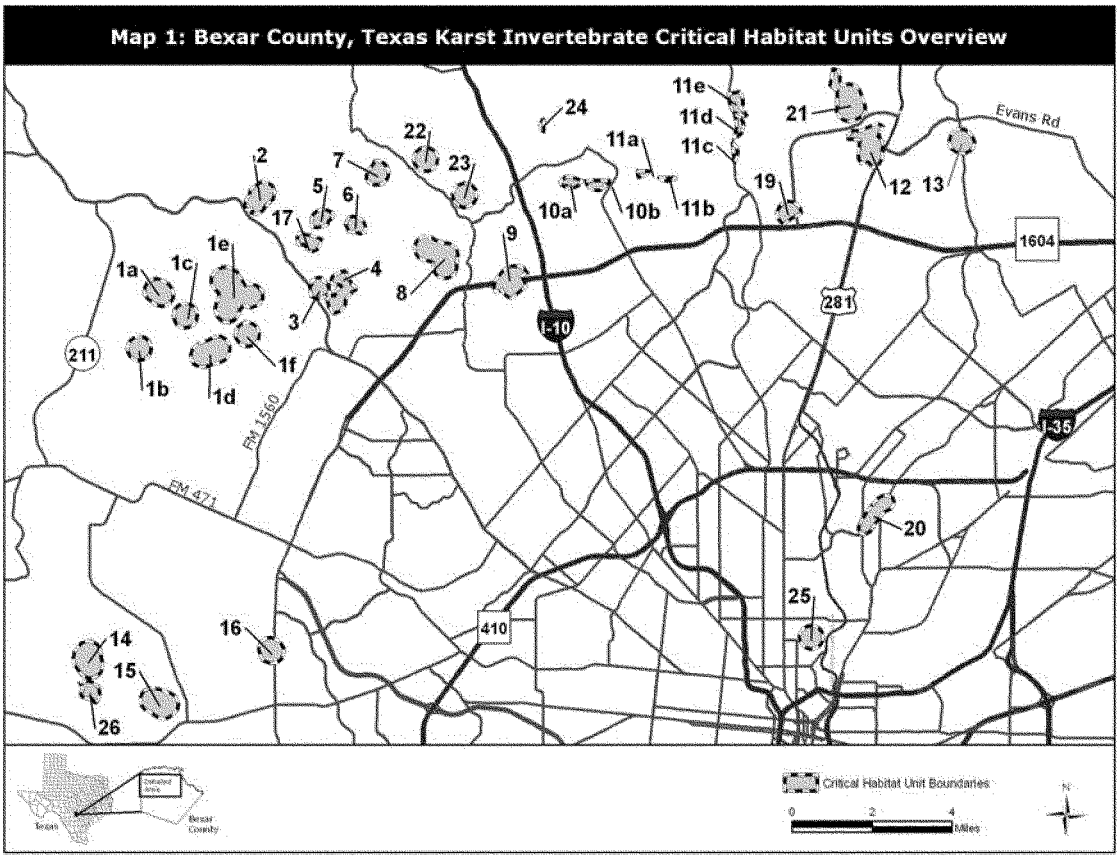
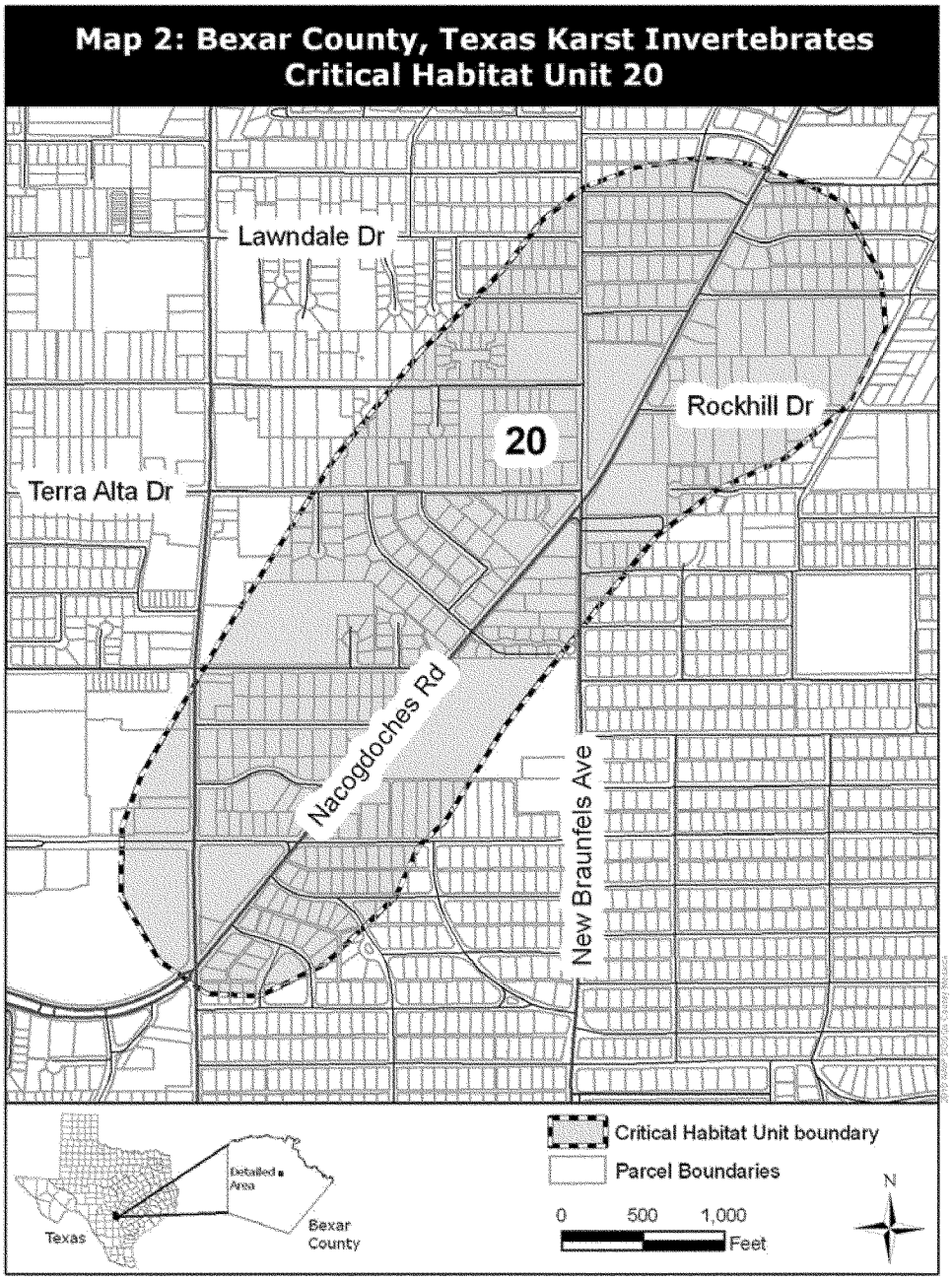


(6) Unit 20: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Unit 20 follows:



Braken Bat Cave Meshweaver (*Cicurina venii*)

(1) Critical habitat for the Braken Bat Cave meshweaver in Bexar County, Texas, occurs in Unit 15, as described in this entry and depicted on Map 3 in this entry. Unit 15 is also depicted on Map 1 (index map) provided at subparagraph (5) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

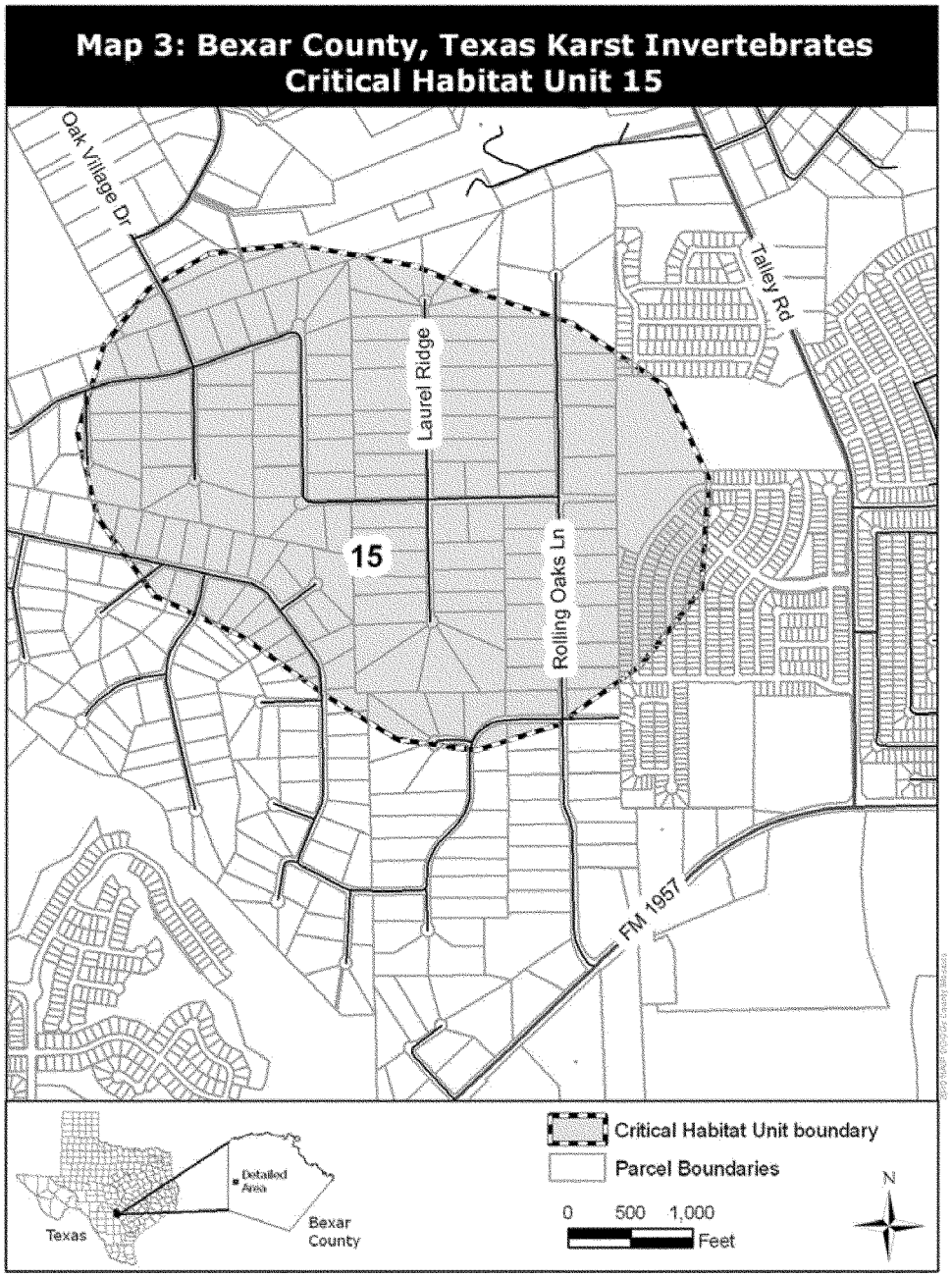
(2) The primary constituent elements of, and the statements regarding developed lands in, critical habitat for the Braken Bat Cave meshweaver are identical to those set forth at subparagraphs (2) and (3) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(3) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 15: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 3 of Unit 15 follows:



Government Canyon Bat Cave Meshweaver (*Cicurina vespera*)

(1) Critical habitat for the Government Canyon Bat Cave meshweaver in Bexar County, Texas, occurs in Unit 1b, as described in this entry and depicted on Map 4 in this entry. Unit 1b is also depicted on Map 1 (index map) provided at subparagraph (5) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(2) The primary constituent elements of, and the statements regarding developed lands in, critical habitat for the Government Canyon Bat Cave meshweaver are identical to those set forth at subparagraphs (2) and (3) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(3) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 1b: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 4 of Units 1a, 1b, 1c, 1d, 1e, and 1f follows:

* * * * *

Madla Cave Meshweaver (*Cicurina madla*)

(1) Critical habitat for the Madla Cave meshweaver in Bexar County, Texas, occurs in Units 1a, 1c, 1d, 1e, 2, 3, 5, 6, 8, 9, 17, and 22, as described in this entry and depicted on Maps 5, 6, 7, 8, 9, and 10 in this entry. Units 1a, 1c, 1d, and 1e are depicted on Map 4, which is provided at subparagraph (4)(ii) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g). Units 1a, 1c, 1d, 1e, 2, 3, 5, 6, 7, 8, 9, 17, and 22 are also depicted on Map 1 (index map) provided at subparagraph (5) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(2) The primary constituent elements of, and the statements regarding developed lands in, critical habitat for the Madla Cave meshweaver are identical to those set forth at subparagraphs (2) and (3) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(3) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 1a: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 1a is depicted on Map 4, which is provided at subparagraph (4)(ii) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g).

(5) Unit 1c: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 1c is depicted on Map 4, which is provided at subparagraph (4)(ii) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g).

(6) Unit 1d: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 1d is depicted on Map 4, which is provided at subparagraph (4)(ii) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g).

(7) Unit 1e: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 1e is depicted on Map 4, which is provided at subparagraph (4)(ii) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g).

(8) Unit 2: Bexar County, Texas.

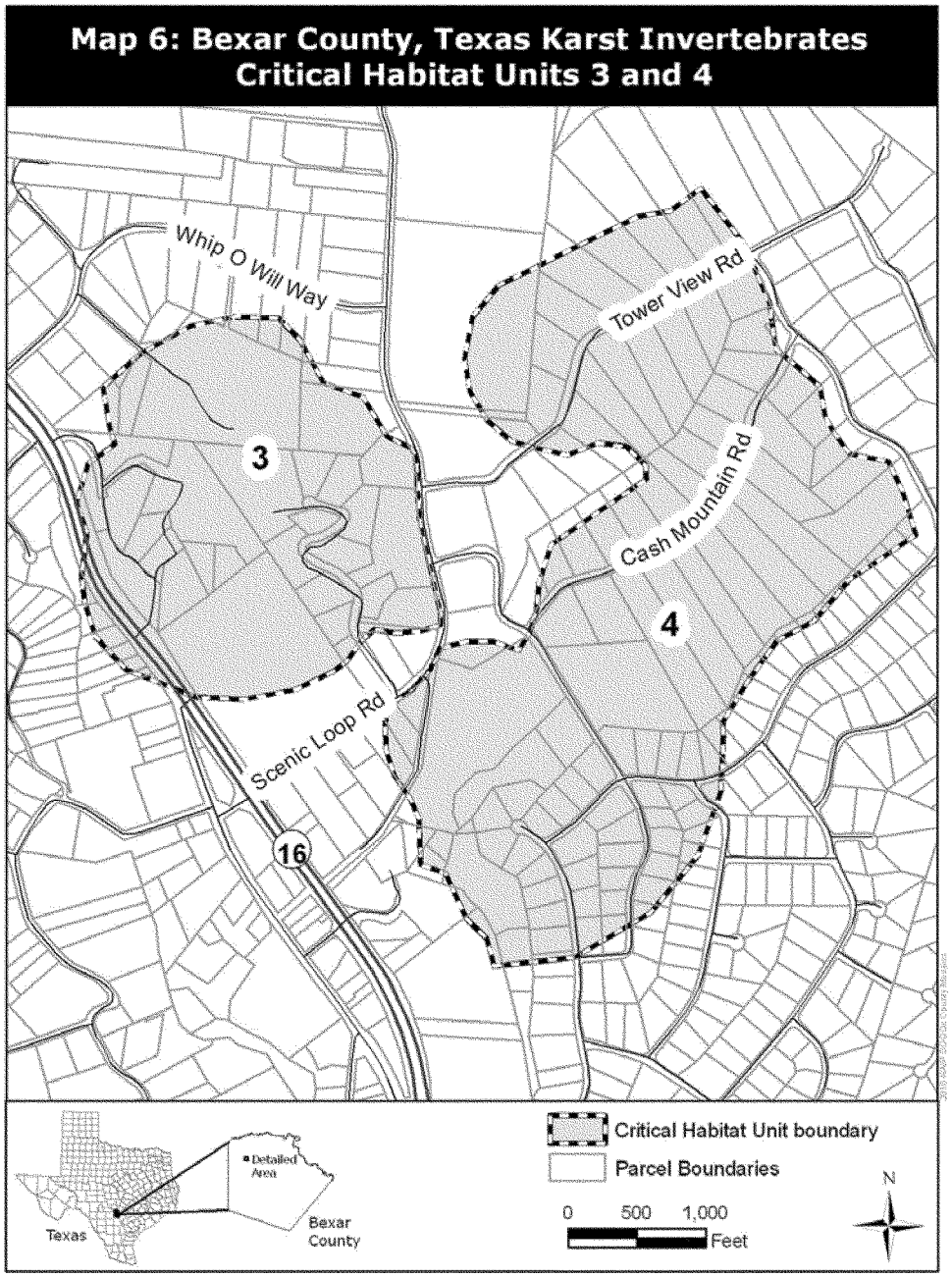
(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 5 of Unit 2 follows:

(9) Unit 3: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 6 of Units 3 and 4 follows:



(10) Unit 5: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 7 of Units 5, 6, and 17 follows:

(11) Unit 6: Bexar County, Texas.

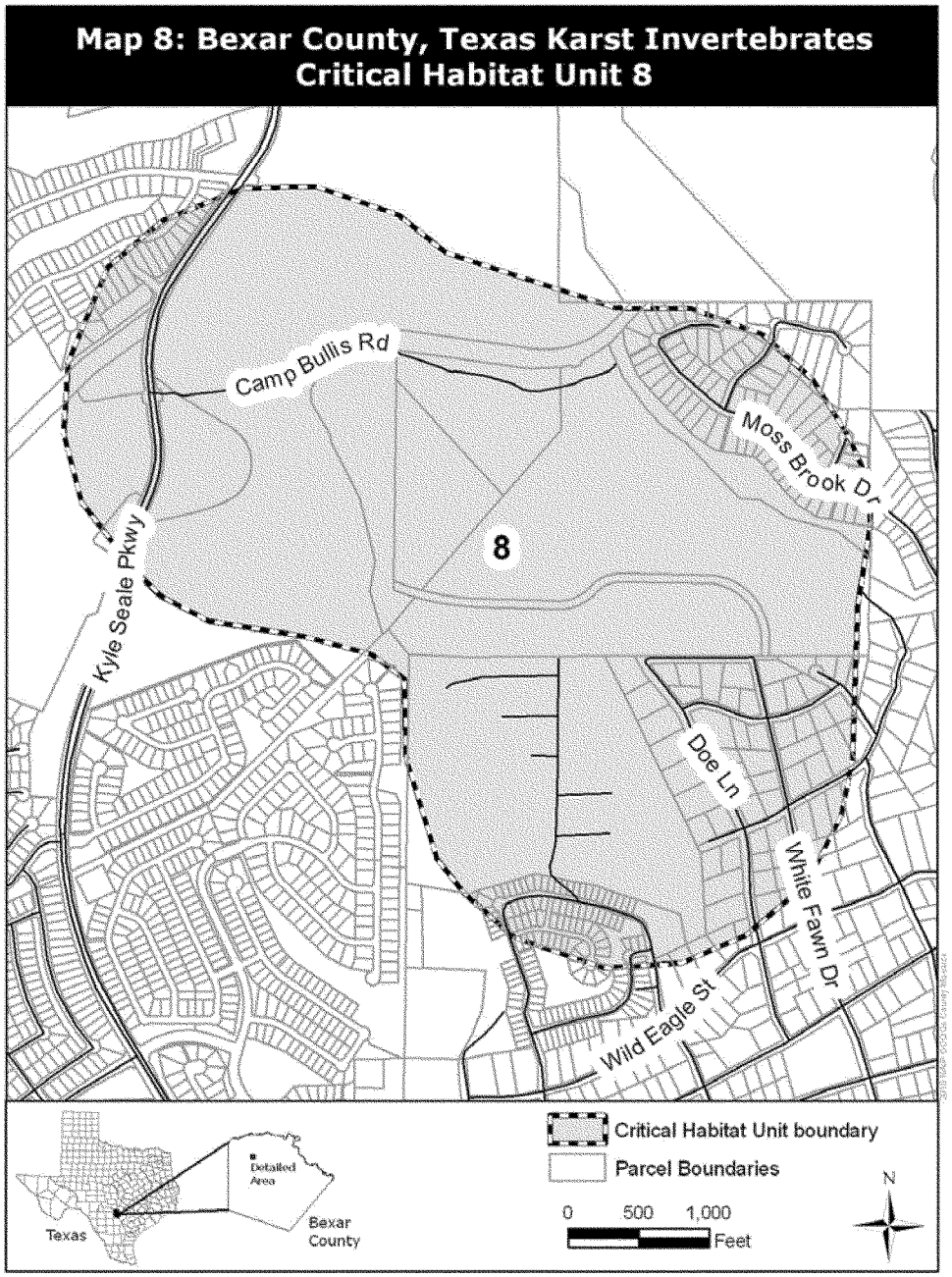
(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 6 is depicted on Map 7, which is provided at subparagraph (10)(ii) of this entry.

(12) Unit 8: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

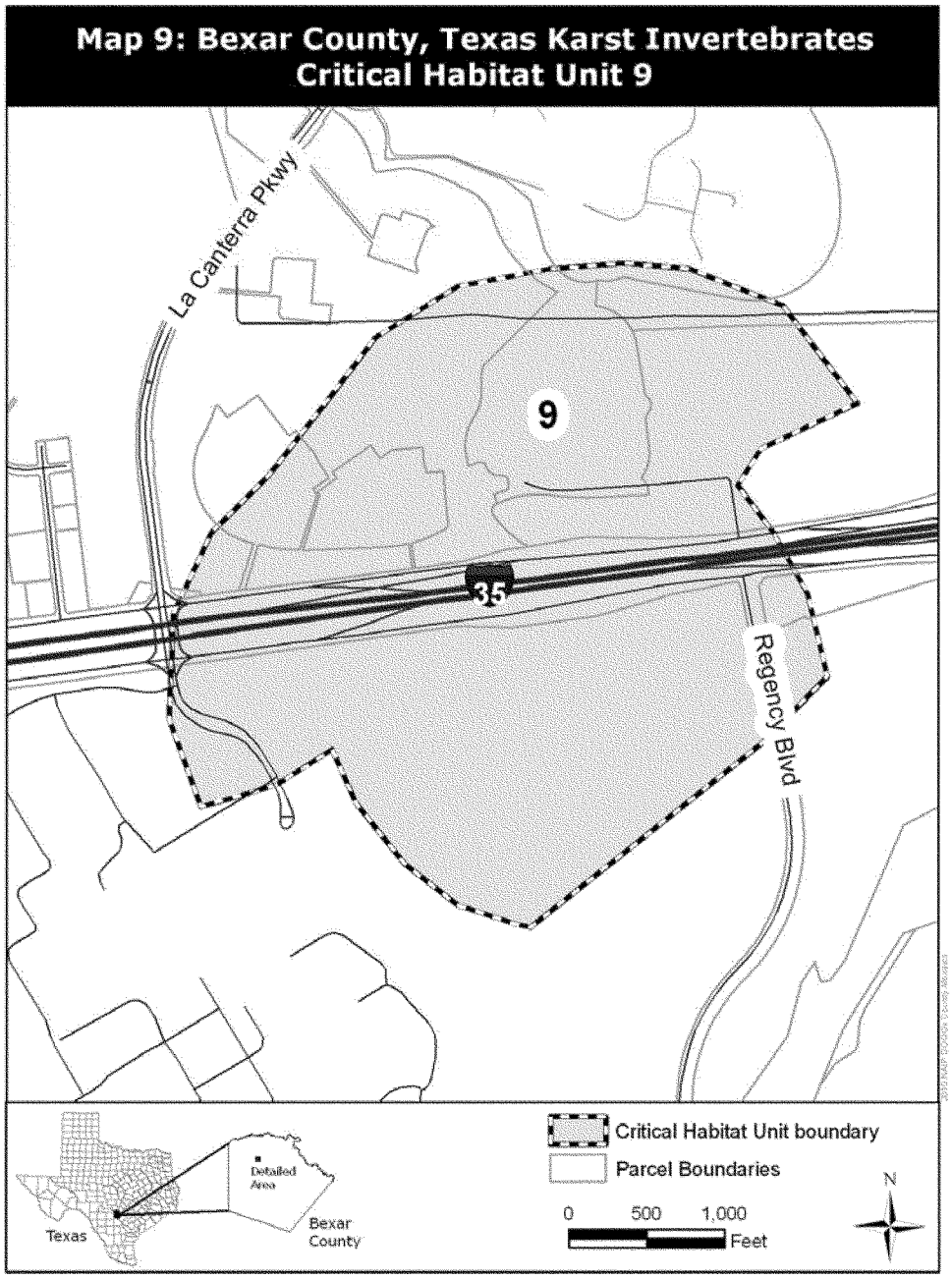
(ii) **Note:** Map 8 of Unit 8 follows:



(13) Unit 9: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 9 of Unit 9 follows:



(14) Unit 17: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Unit 17 is depicted on Map 7, which is provided at subparagraph (10)(ii) of this entry.

(15) Unit 22: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 10 of Unit 22 follows:

Robber Baron Cave Meshweaver (*Cicurina baronia*)

(1) Critical habitat for the Robber Baron Cave meshweaver in Bexar County, Texas, occurs in Units 20 and 25. Unit 20 is described as set forth, and depicted on Map 2 provided, at subparagraph (6) of the entry for the Cokendolpher Cave harvestman in this paragraph (g). Unit 25 is described in this entry and depicted on Map 11 in this entry. Units 20 and 25 are also depicted on Map 1 (index map) provided at subparagraph (5) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(2) The primary constituent elements of, and the statements regarding developed lands in, critical habitat for the Robber Baron Cave meshweaver are identical to those set forth at subparagraphs (2) and (3) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

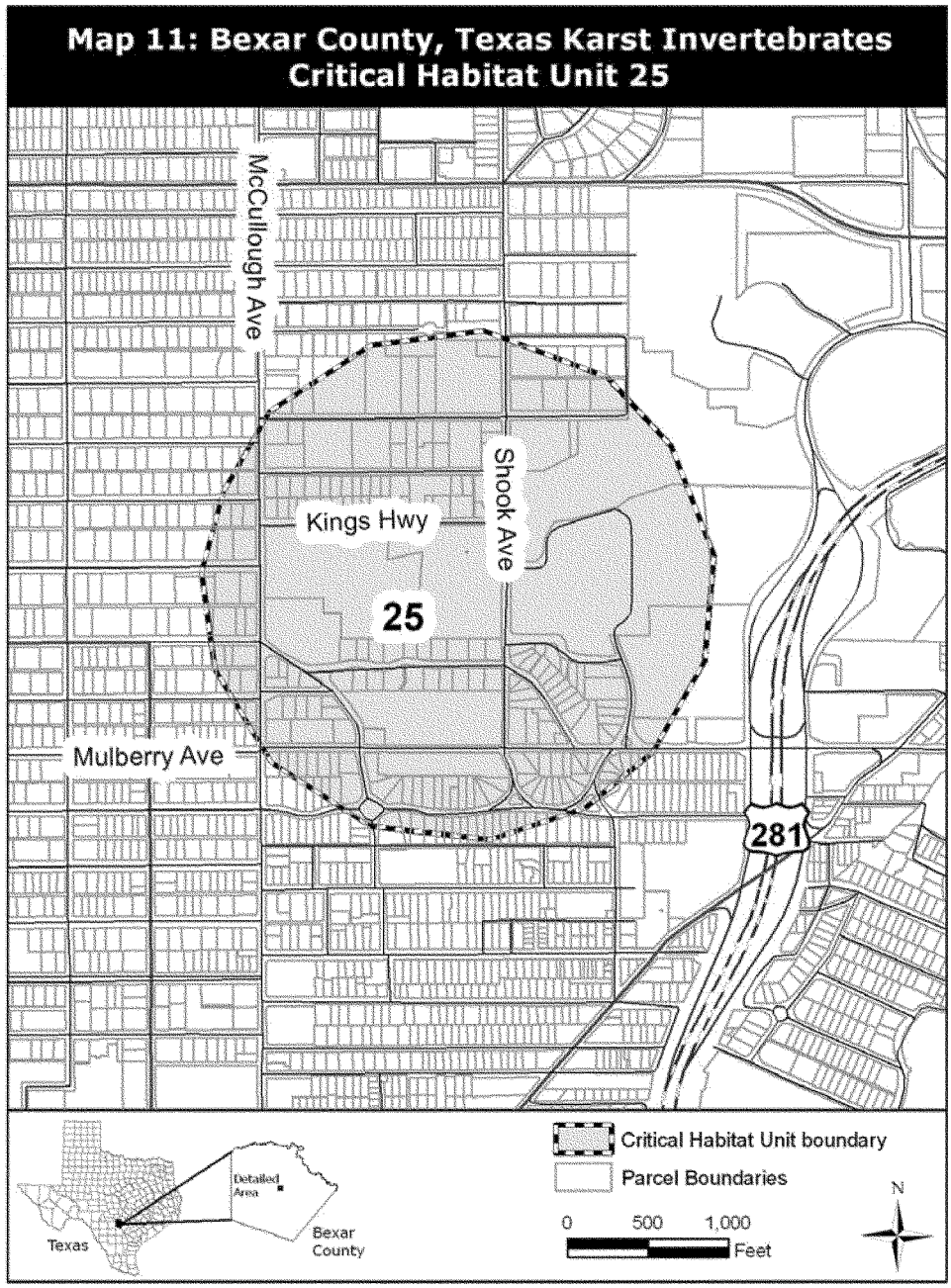
(3) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 20: Bexar County, Texas. Unit 20 is described as set forth, and depicted on Map 2 provided, at subparagraph (6) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(5) Unit 25: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 11 of Unit 25 follows:



Government Canyon Bat Cave Spider (*Neoleptoneta microps*)

(1) Critical habitat for the Government Canyon Bat Cave spider in Bexar County, Texas, occurs in Unit 1b, as described and depicted on Map 4 at subparagraph (4) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g). Unit 1b is also depicted on Map 1 (index map) provided at subparagraph (5) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(2) The primary constituent elements of, and statements regarding developed lands in, critical habitat for the Government Canyon Bat Cave spider are identical to those set forth at subparagraphs (2) and (3) of the entry for the Cokendolpher Cave harvestman in this paragraph (g).

(3) Data layers defining this map unit were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 1b: Bexar County, Texas. Unit 1b is described as set forth, and depicted on Map 4 provided, at subparagraph (4) of the entry for the Government Canyon Bat Cave meshweaver in this paragraph (g).

* * * * *

(i) *Insects.*

* * * * *

Helotes Mold Beetle (Batrisodes venyivi)

(1) Critical habitat for the Helotes mold beetle in Bexar County, Texas, which occurs in Units 1e, 3, and 5 as described in this entry and depicted on Maps 1 (index map), 2, 4, and 5 of this entry.

(2) The primary constituent elements of critical habitat for *Batrisodes venyivi* are:

(i) Karst-forming rock containing subterranean spaces (caves and connected mesocaverns) with stable temperatures, high humidities (near saturation), and suitable substrates (for example, spaces between and underneath rocks for foraging and sheltering);

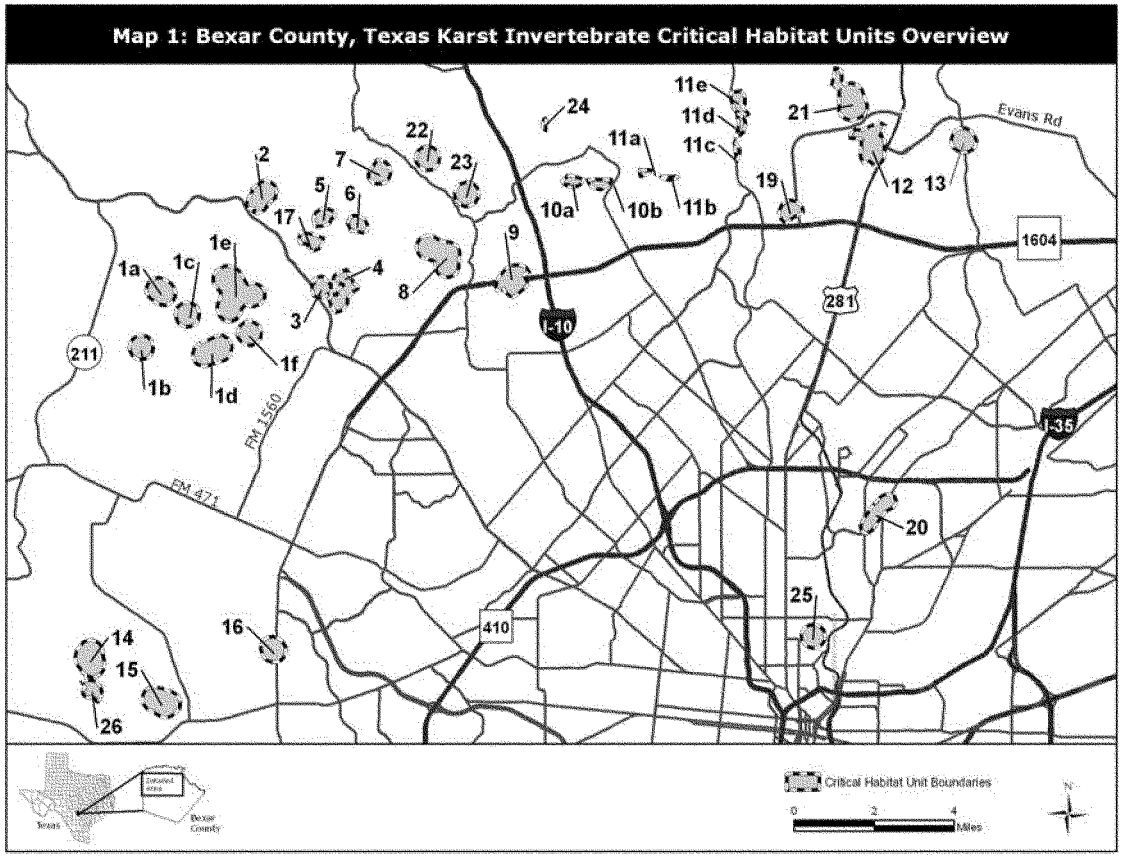
(ii) Surface water free of pollutants that flows into the karst features. Sources may include surface runoff that flows directly into the caves' entrances, or water that flows through associated features, such as sinkholes and fractures known to connect to the karst features, or water that flows through the connected subsurface drainage area, which consequently allows water to flow into caves and passages; and

(iii) A healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) living near the karst feature that provide nutrient input and protects the karst ecosystem from adverse effects (for example, from nonnative species invasions, contaminants, and fluctuations in temperature and humidity).

(3) Developed lands (residential or commercial) that do not contain the subsurface primary constituent element (*see* subparagraph (2)(i) of this entry) and that existed on the effective date of this rule are not considered to be critical habitat.

(4) Critical habitat map units. Data layers defining map units were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(5) Index Map of Bexar County invertebrates critical habitat units, Bexar County, Texas follows:



(6) Unit 1e: Bexar County, Texas.

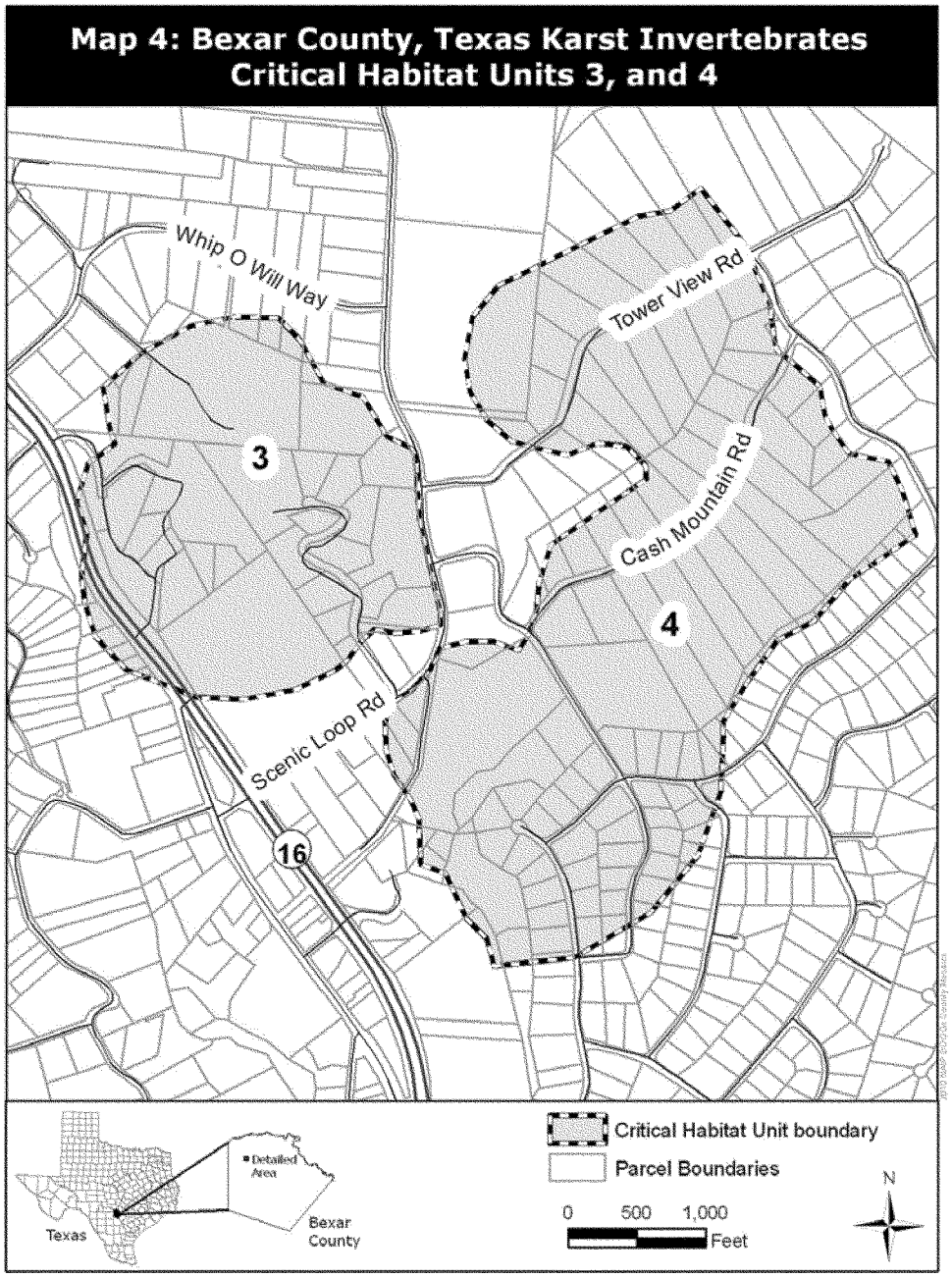
(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f follows:

(7) Unit 3: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 4 of Units 3 and 4 follows:



(8) Unit 5: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 5 of Units 5, 6, and 17 follows:

Beetle (No Common Name) (*Rhadine exilis*)

(1) Critical habitat for the beetle (*Rhadine exilis*) in Bexar County, Texas, which occurs in Units 1b, 1d, 1e, 2, 3, 4, 5, 6, 7, 8, 9, 11a, 11b, 11c, 11d, 11e, 12, 13, 21, and 24, is depicted on Maps 3, 6, 7, 8, 10, 11, 12, 13, 19, and 22 in this entry, and on Maps 2, 4, and 5 provided at subparagraph (5) of the entry for the Helotes mold beetle in this paragraph (i). The Units are also depicted on Map 1 (index map) provided in subparagraph (5) of the entry for the Helotes mold beetle in this paragraph (i).

(2) The primary constituent elements of, and the statements regarding developed lands in, critical habitat for the *Rhadine exilis* are identical to those set forth at subparagraphs (2) and (3) of the entry for the Helotes mold beetle in this paragraph (i).

(3) Critical habitat map units. Data layers defining map units were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 1b: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 1a, 1b, 1c, 1d, 1e, and 1f are depicted on Map 2, which is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(5) Unit 1d: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 1a, 1b, 1c, 1d, 1e, and 1f are depicted on Map 2, which is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(6) Unit 1e: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 1a, 1b, 1c, 1d, 1e, and 1f are depicted on Map 2, which is

provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(7) Unit 2: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 3 of Unit 2 follows:

BILLING CODE 4310–55–P

(8) Unit 3: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 3 and 4 are depicted on Map 4, which is provided at subparagraph (7)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(9) Unit 4: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 3 and 4 are depicted on Map 4, which is provided at subparagraph (7)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(10) Unit 5: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 5, 6, and 17 are depicted on Map 5, which is provided at subparagraph (8)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(11) Unit 6: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 5 and 6 are depicted on Map 5, which is provided at subparagraph (8)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(12) Unit 7: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

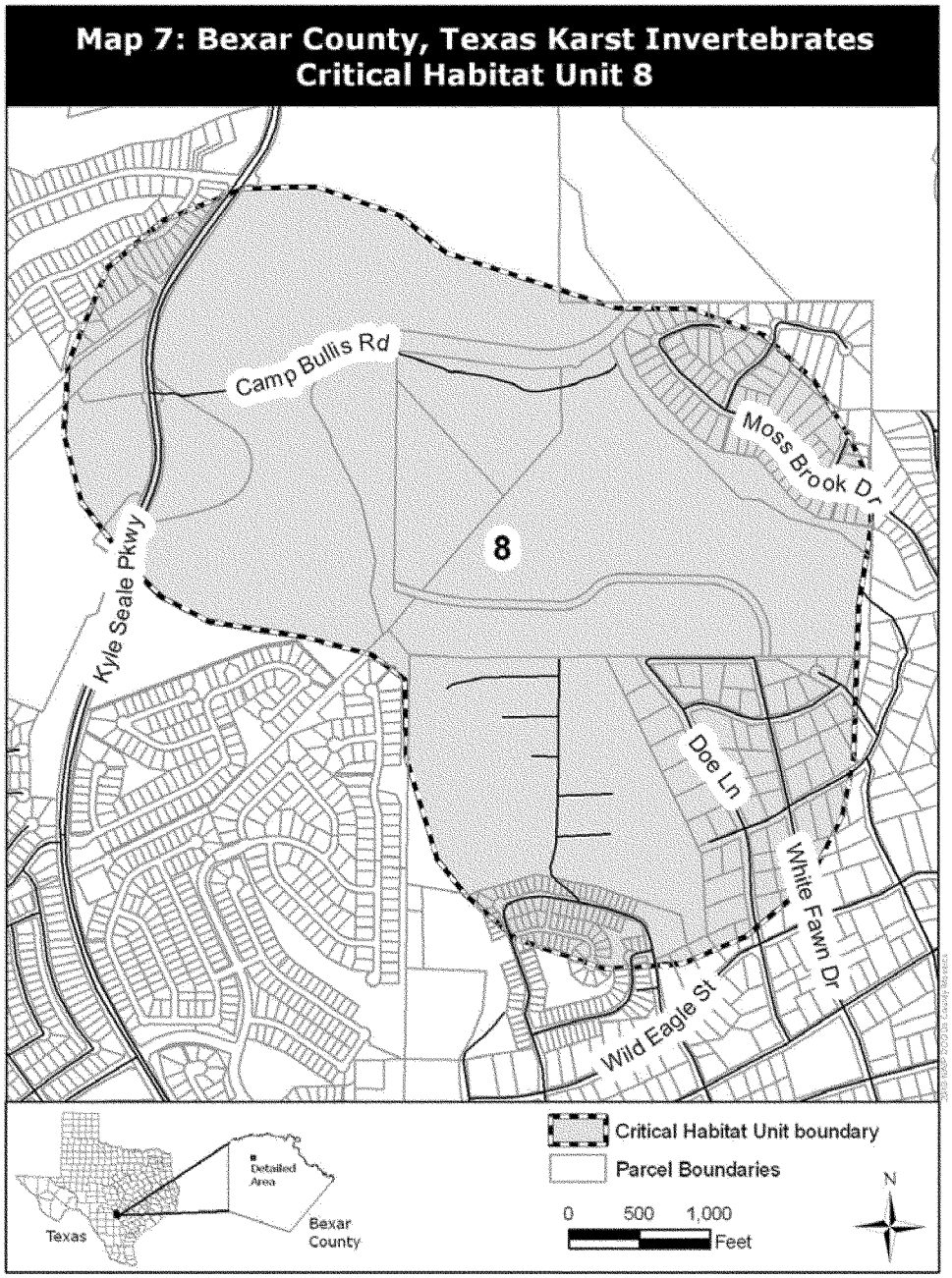
(ii) **Note:** Map 6 of Unit 7 follows:

BILLING CODE 4310–55–P

(13) Unit 8: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

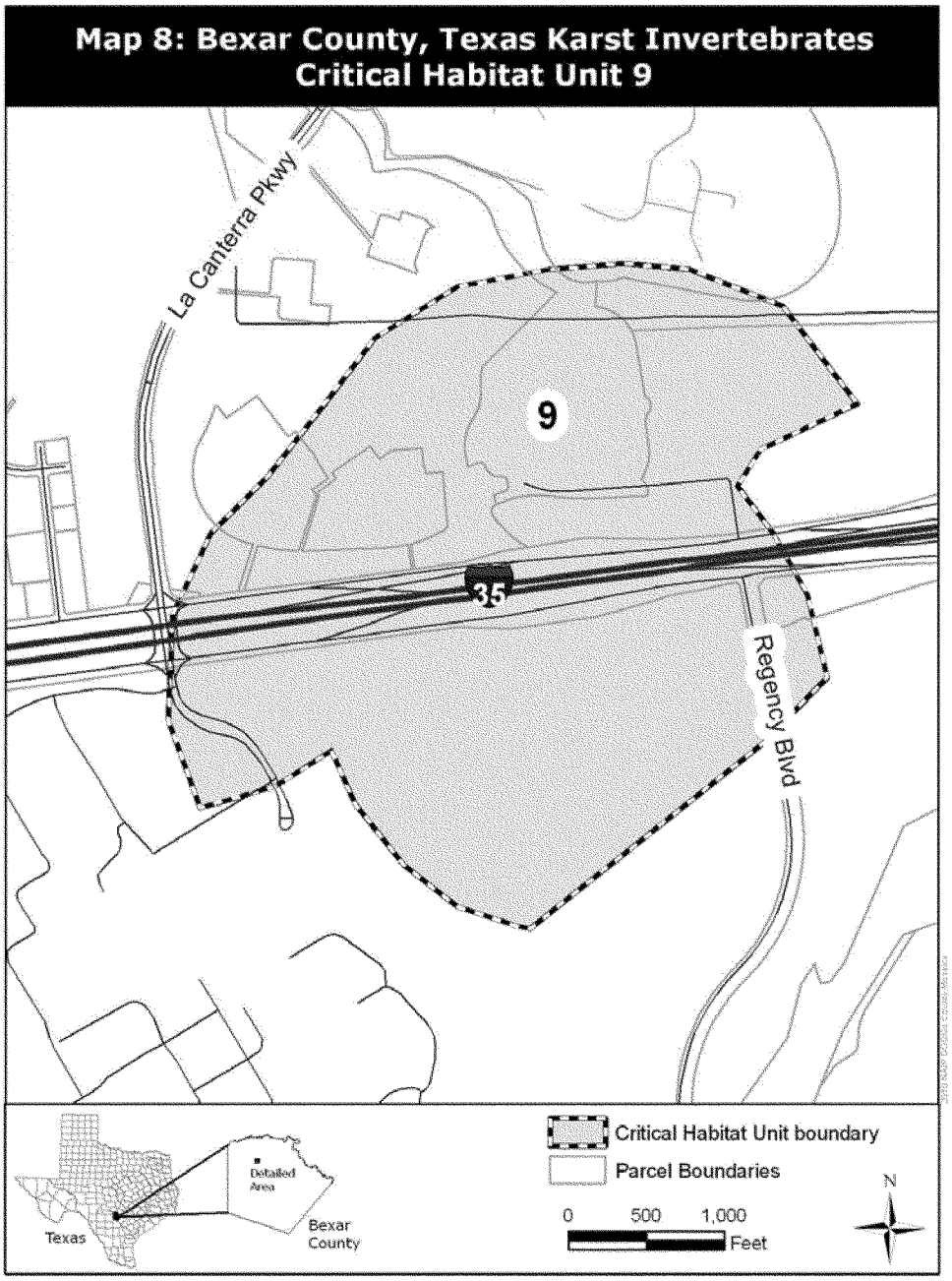
(ii) **Note:** Map 7 of Unit 8 follows:



(14) Unit 9: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

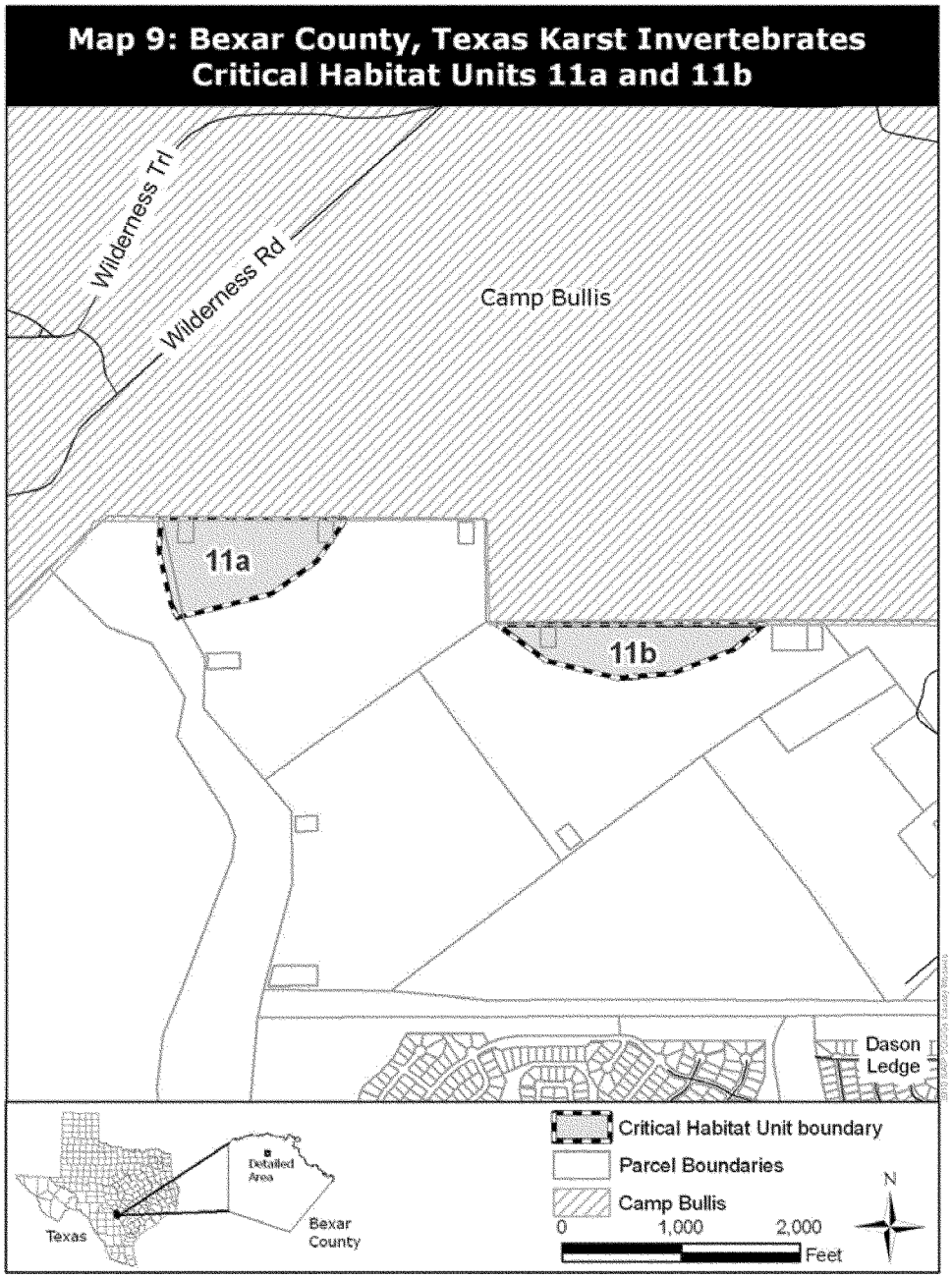
(ii) **Note:** Map 8 of Unit 9 follows:



(15) Unit 11a: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 9 of Units 11a and 11b follows:



(16) Unit 11b: Bexar County, Texas.

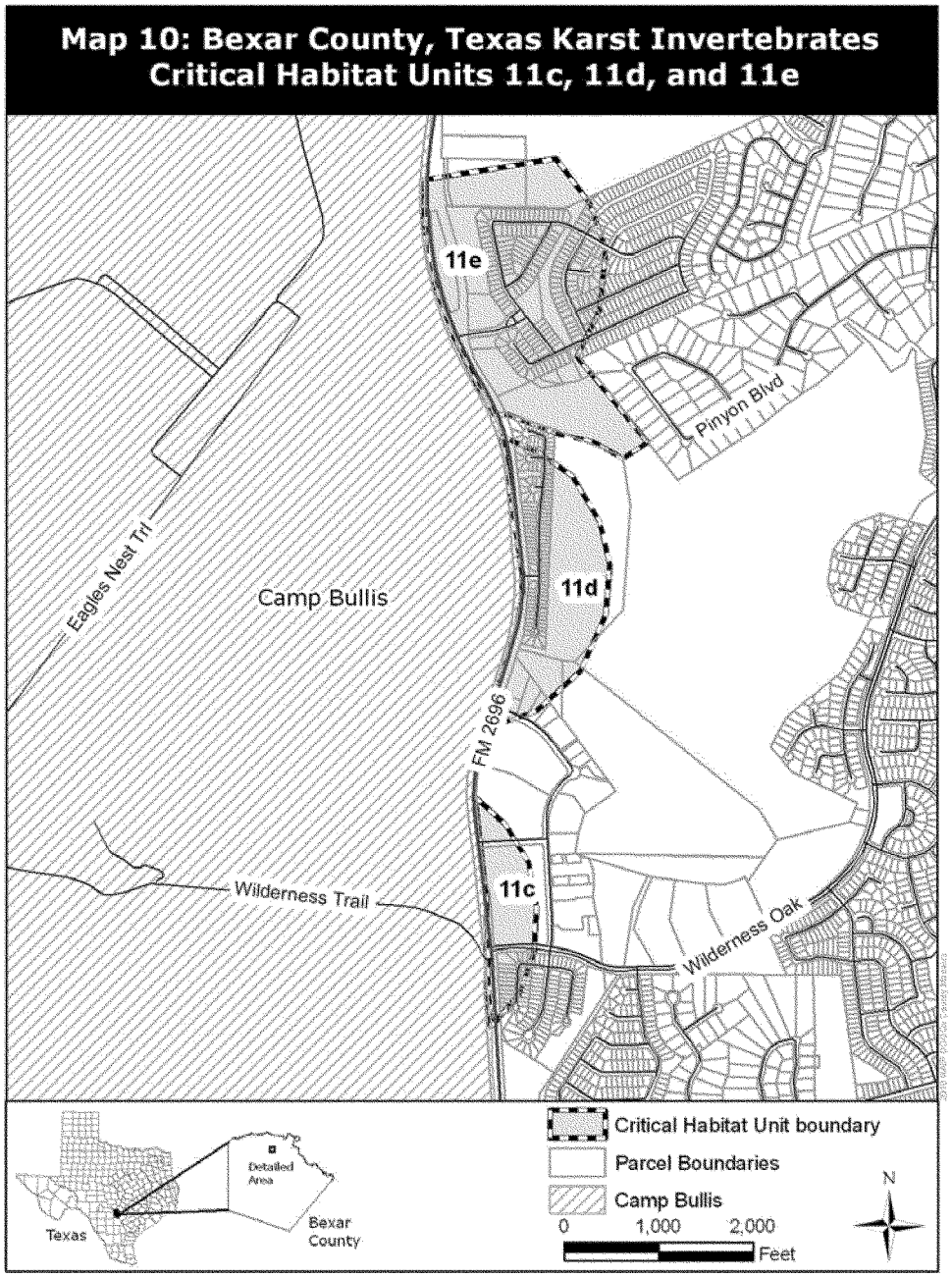
(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 11a and 11b are depicted on Map 9, which is provided at subparagraph (15)(ii) of this entry.

(17) Unit 11c: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 10 of Units 11c, 11d, and 11e follows:



(18) Unit 11d: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 11c, 11d, and 11e are depicted on Map 10, which is provided at subparagraph (17)(ii) of this entry.

(19) Unit 11e: Bexar County, Texas

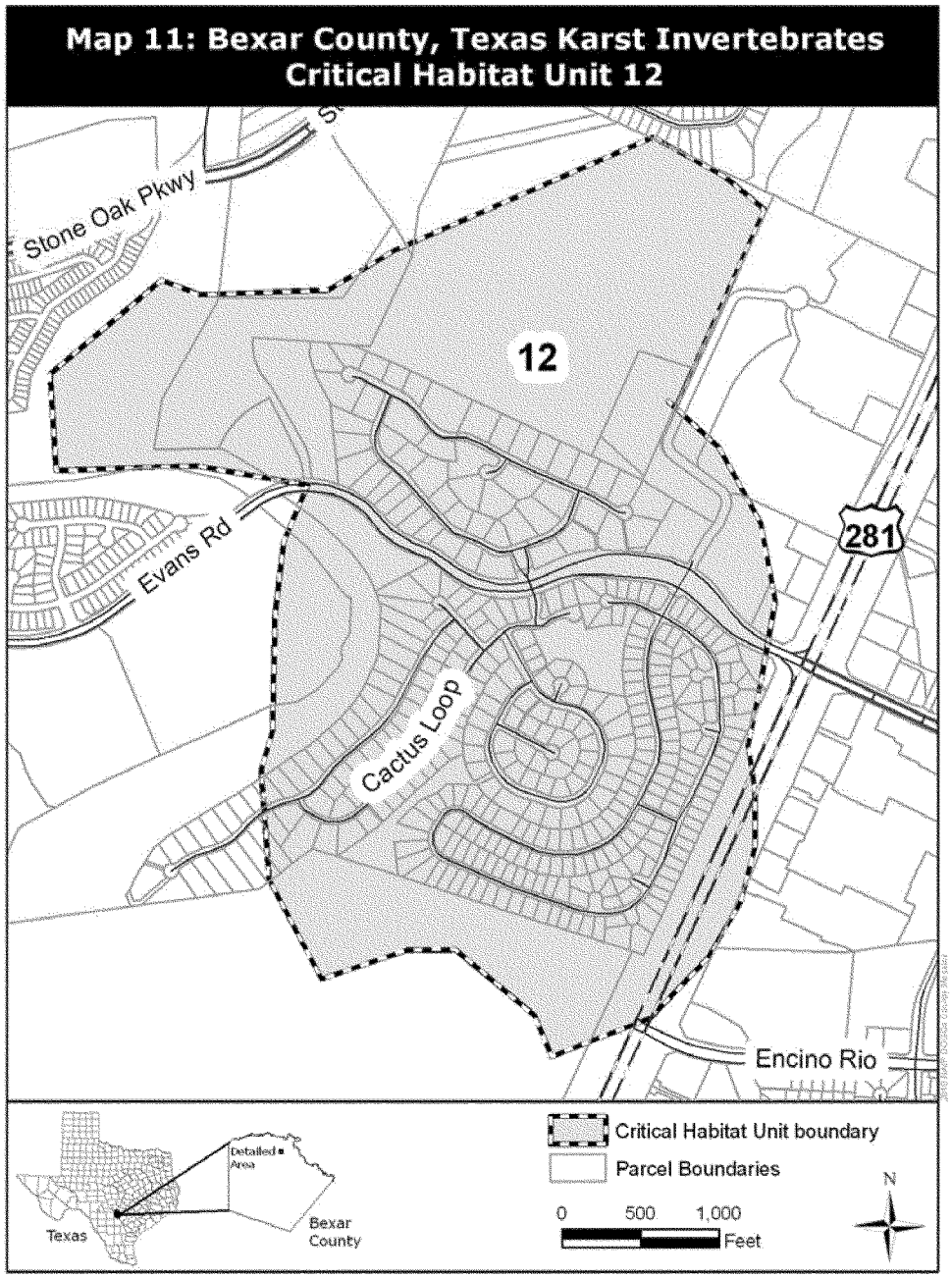
(i) [Reserved for textual description of unit.]

(ii) **Note:** Units 11c, 11d, and 11e are depicted on Map 10, which is provided at subparagraph (17)(ii) of this entry.

(20) Unit 12: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

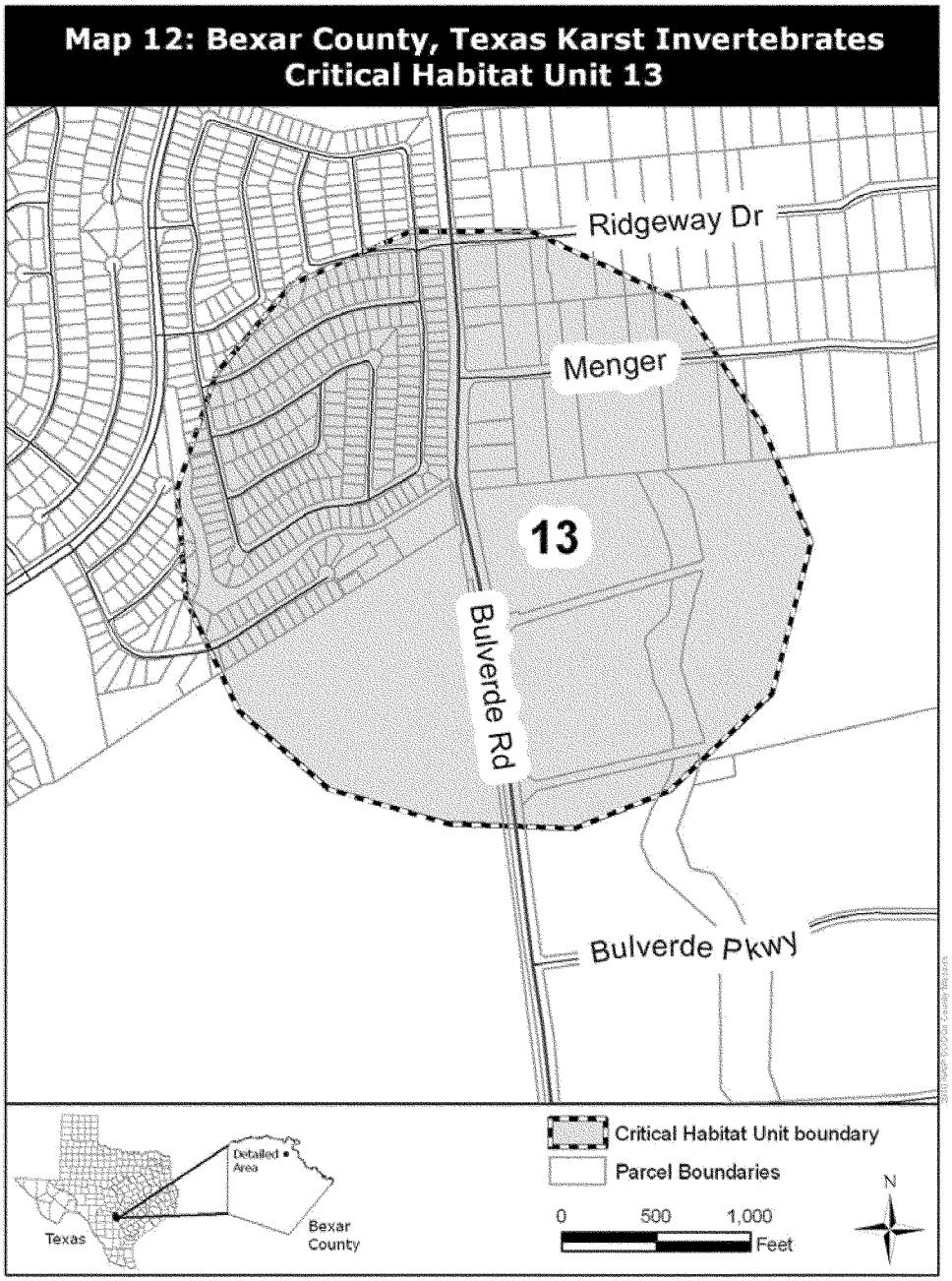
(ii) **Note:** Map 11 of Unit 12 follows:



(21) Unit 13: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

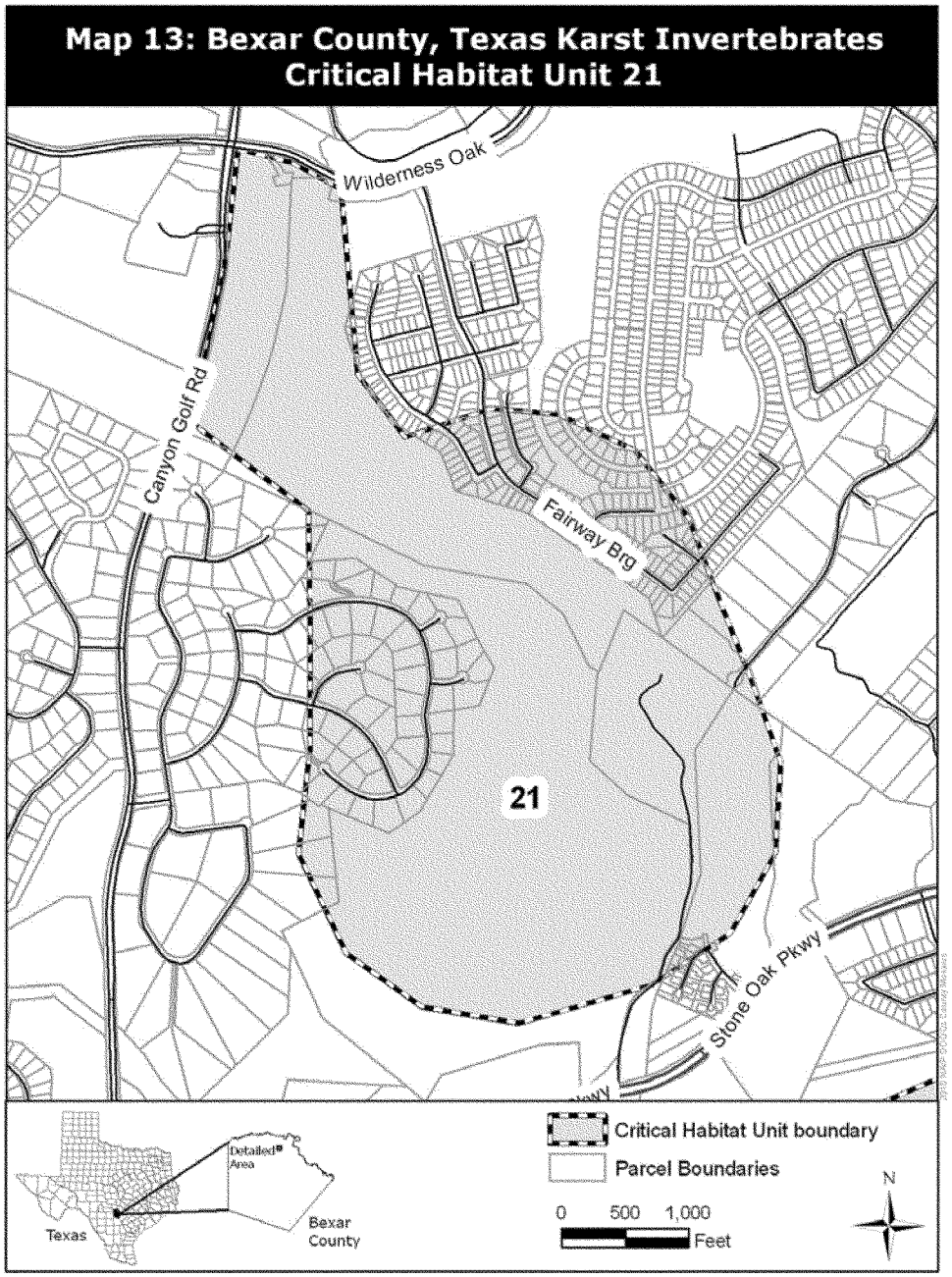
(ii) **Note:** Map 12 of Unit 13 follows:



(22) Unit 21: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

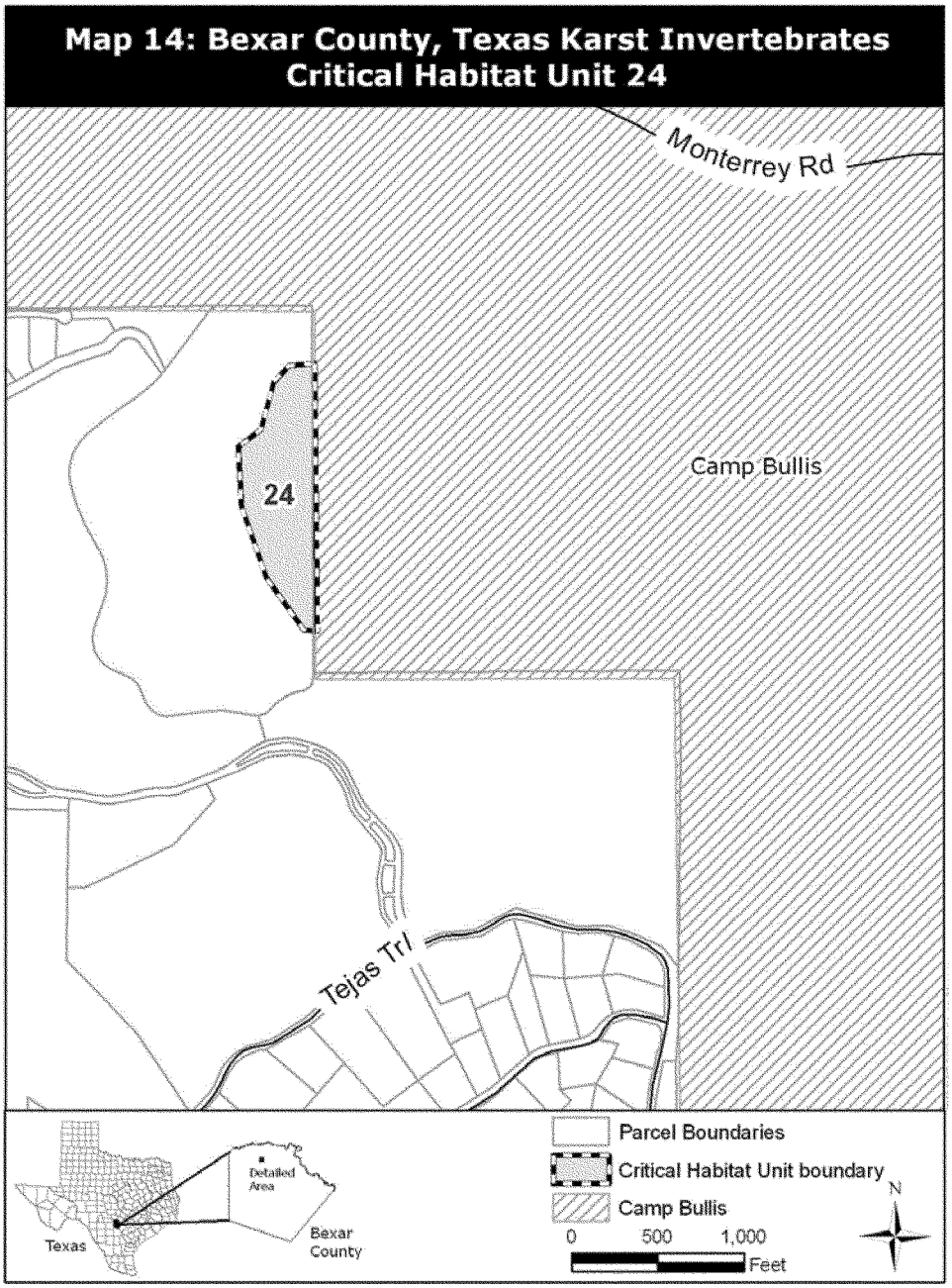
(ii) **Note:** Map 13 of Unit 21 follows:



(23) Unit 24: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 14 of Unit 24 follows:



Beetle (No Common Name) (*Rhadine infernalis*)

(1) Critical habitat for the beetle (*Rhadine infernalis*) in Bexar County, Texas, occurs in Units 1a, 1b, 1d, 1e, 1f, 2, 3, 4, 5, 6, 8, 10a, 10b, 14, 15, 16, 17, 19, 23, and 26. These units are depicted on Maps, 15, 16, 17, 18, 19, 20 and 21 in this entry; on Maps 2, 4, and 5 provided at subparagraphs (6), (7), and (8) of the entry for the Helotes mold beetle in this paragraph (i); and on Maps 3 and 7 provided at subparagraphs (7) and (13) of the entry for the beetle (*Rhadine exilis*) in this paragraph (i). The units are also depicted on Map 1 (index map) provided in subparagraph (5) of the entry for the Helotes mold beetle in paragraph (i).

(2) The primary constituent elements of, and statements regarding developed lands in critical habitat for *Rhadine infernalis* are identical to those set forth at subparagraphs (2) and (3) of the entry for the Helotes mold beetle in this paragraph (i).

(3) Critical habitat map units. Data layers defining map units were created using a geographic information system (GIS) which included cave locations, karst zone maps, roads, property boundaries, 2010 aerial photography, and USGS 7.5′ quadrangles. Points were placed on the GIS.

(4) Unit 1a: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(5) Unit 1b: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(6) Unit 1d: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(7) Unit 1e: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(8) Unit 1f: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 2 of Units 1a, 1b, 1c, 1d, 1e, and 1f is provided at subparagraph (6)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(9) Unit 2: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 3 of Unit 2 is provided at subparagraph (7)(ii) of the entry for the beetle (*Rhadine exilis*) in this paragraph (i).

(10) Unit 3: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 4 of Units 3 and 4 is provided at subparagraph (7)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(11) Unit 4: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 4 of Units 3 and 4 is provided at subparagraph (7)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(12) Unit 5: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 5 of Units 5, 6, and 17 is provided at subparagraph (8)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(13) Unit 6: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 5 of Units 5, 6, and 17 is provided at subparagraph (8)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(14) Unit 8: Bexar County, Texas.

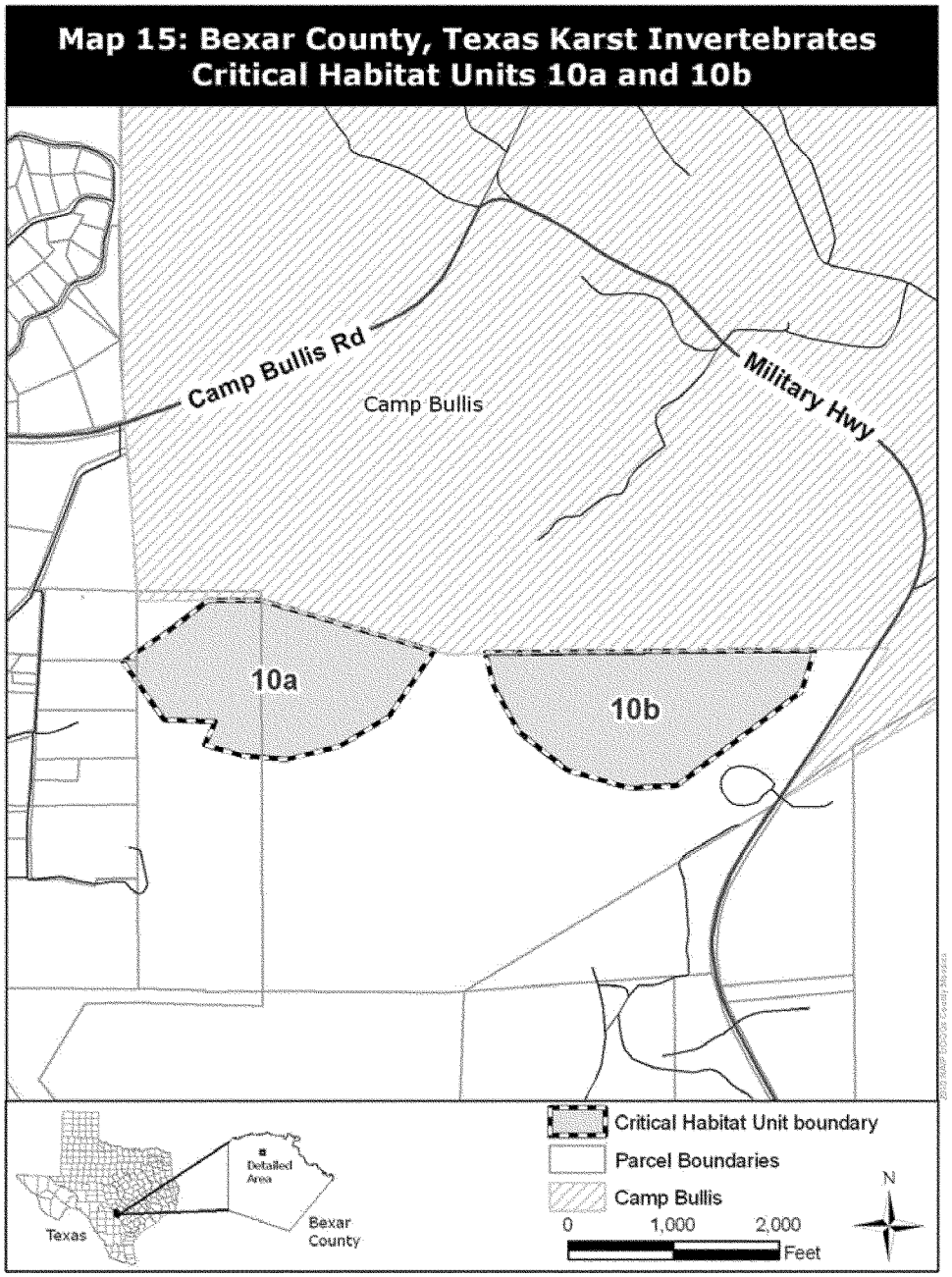
(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 7 of Unit 8 is provided at subparagraph (13)(ii) of the entry for the beetle (*Rhadine exilis*) in this paragraph (i).

(15) Unit 10a: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 15 of Units 10a and 10b follows:



(16) Unit 10b: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 15 of Units 10a and 10b is provided at subparagraph (15)(ii) of this entry.

(17) Unit 14: Bexar County, Texas.

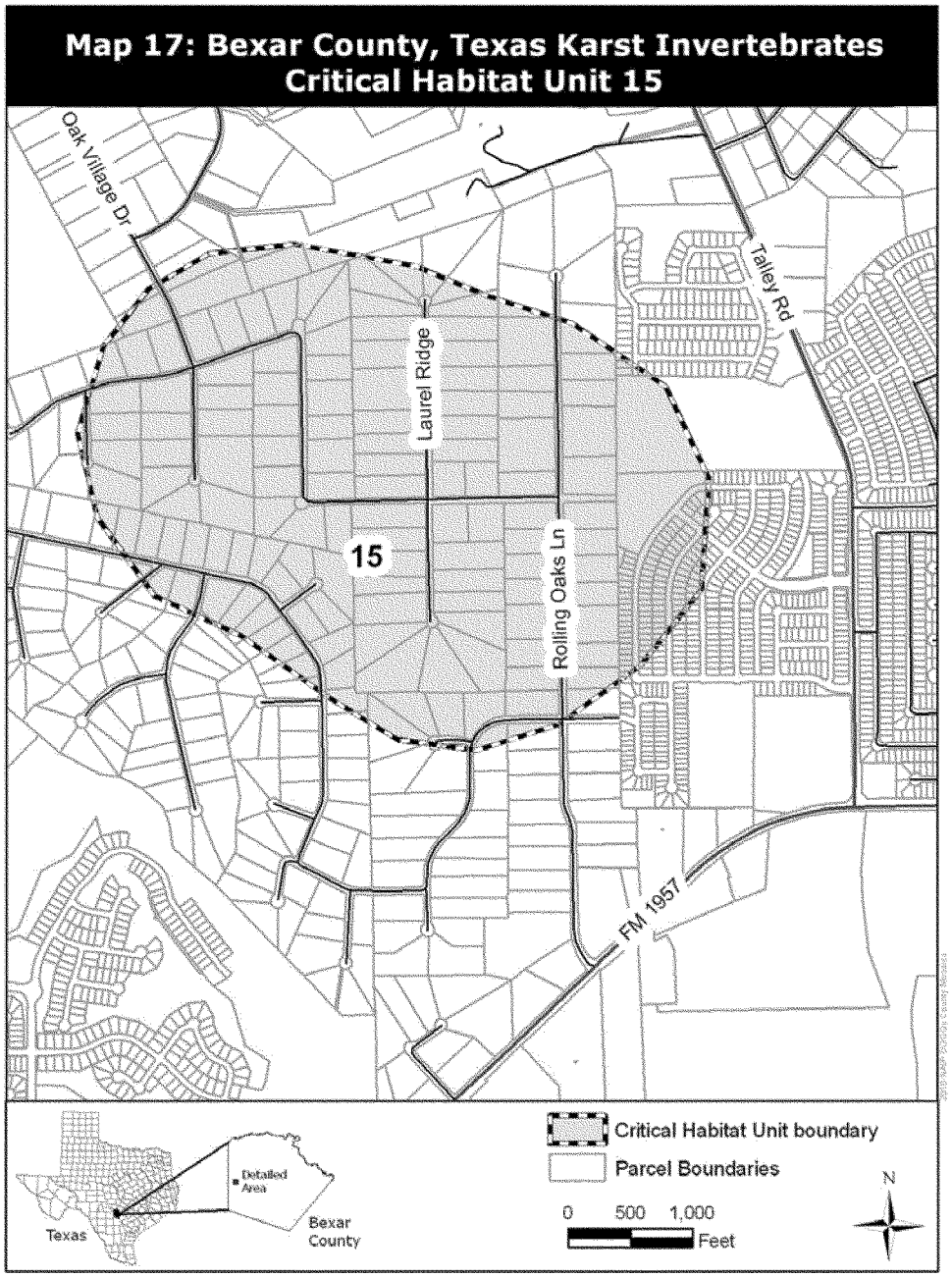
(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 16 of Unit 14 follows:

(18) Unit 15: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

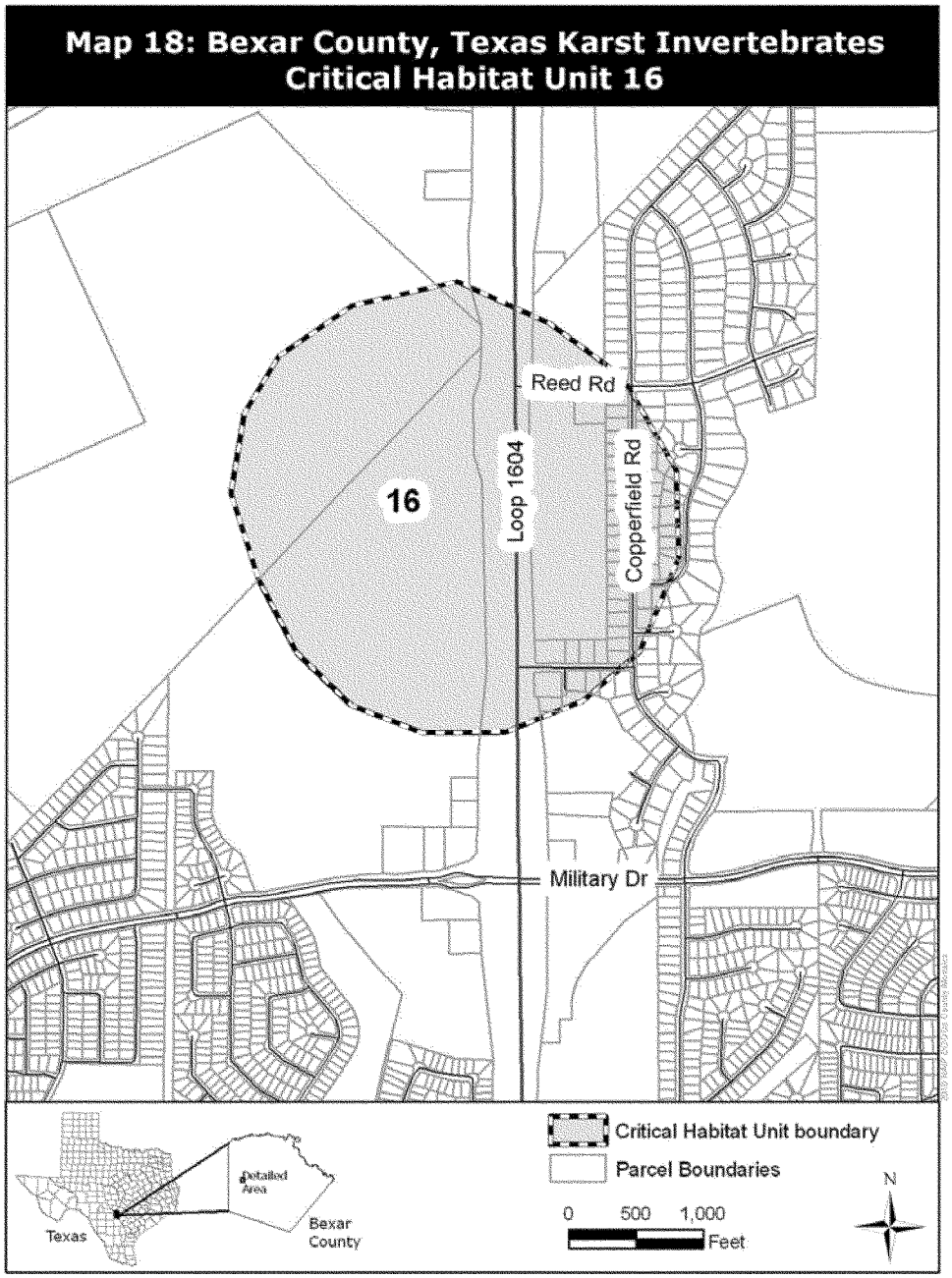
(ii) **Note:** Map 17 of Unit 15 follows:



(19) Unit 16: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 18 of Unit 16 follows:



(20) Unit 17: Bexar County, Texas.

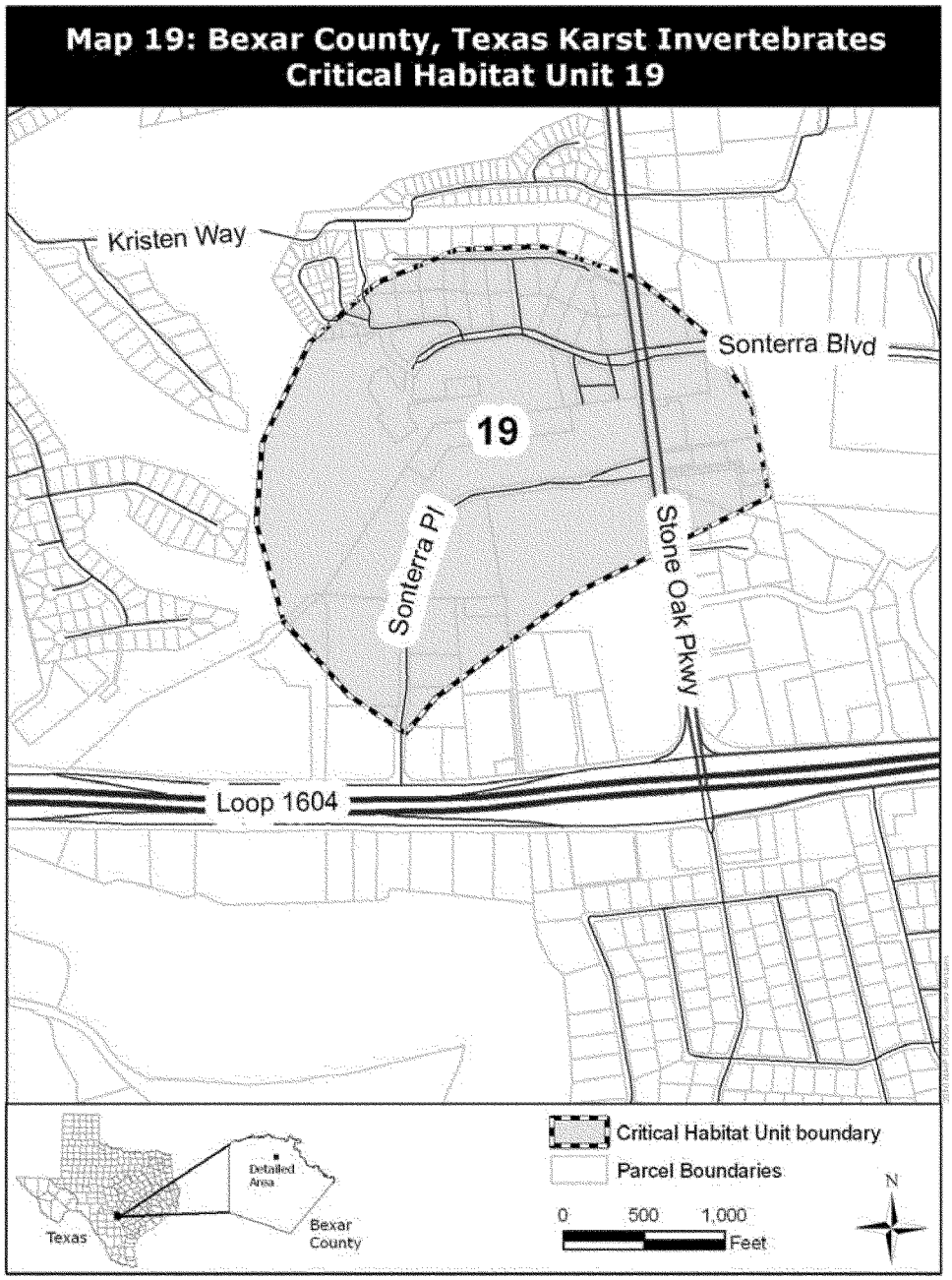
(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 5 of Units 5, 6, and 17 is provided at subparagraph (8)(ii) of the entry for the Helotes mold beetle in this paragraph (i).

(21) Units 19: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

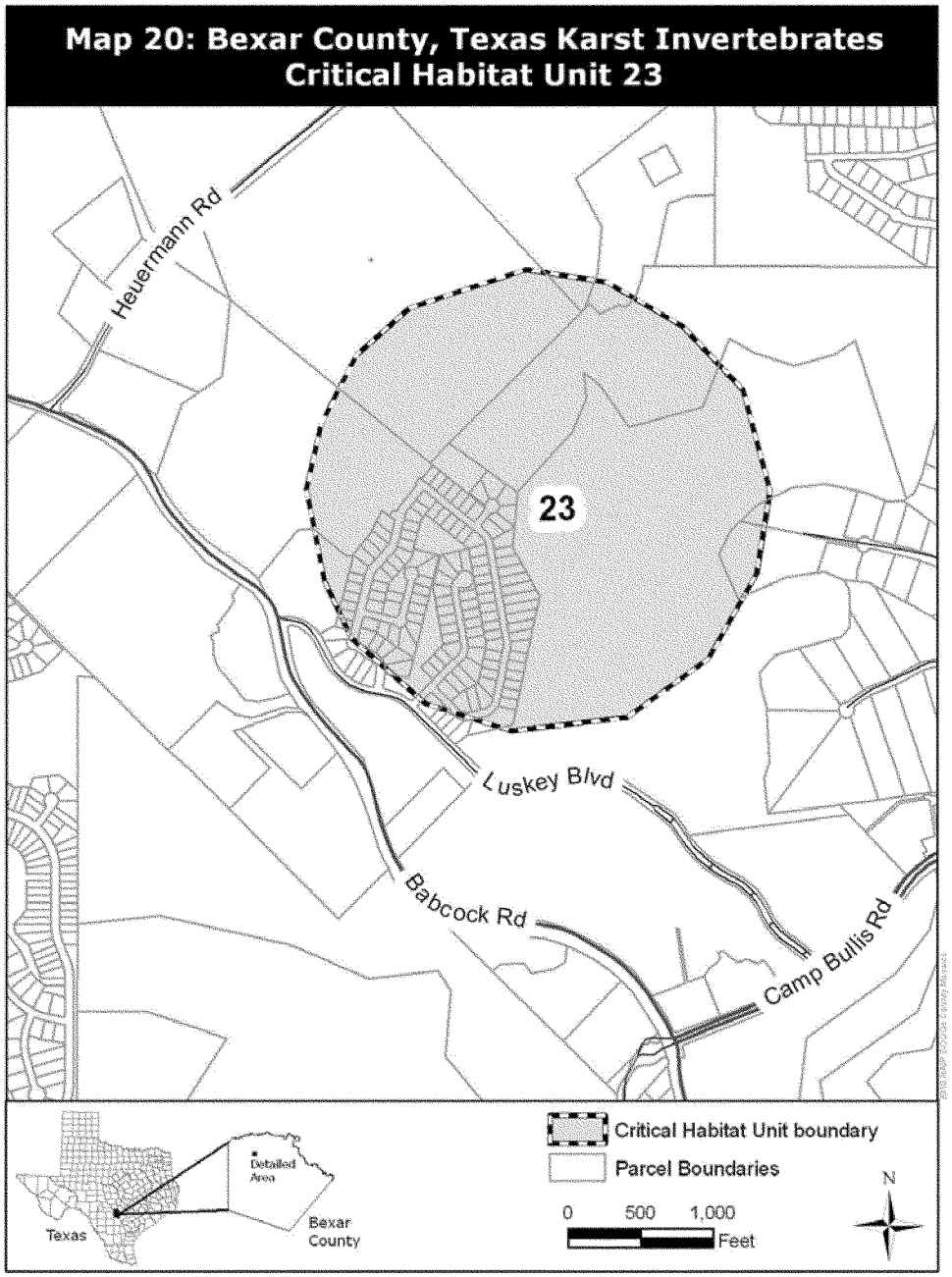
(ii) **Note:** Map 19 of Unit 19 follows:



(22) Unit 23: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

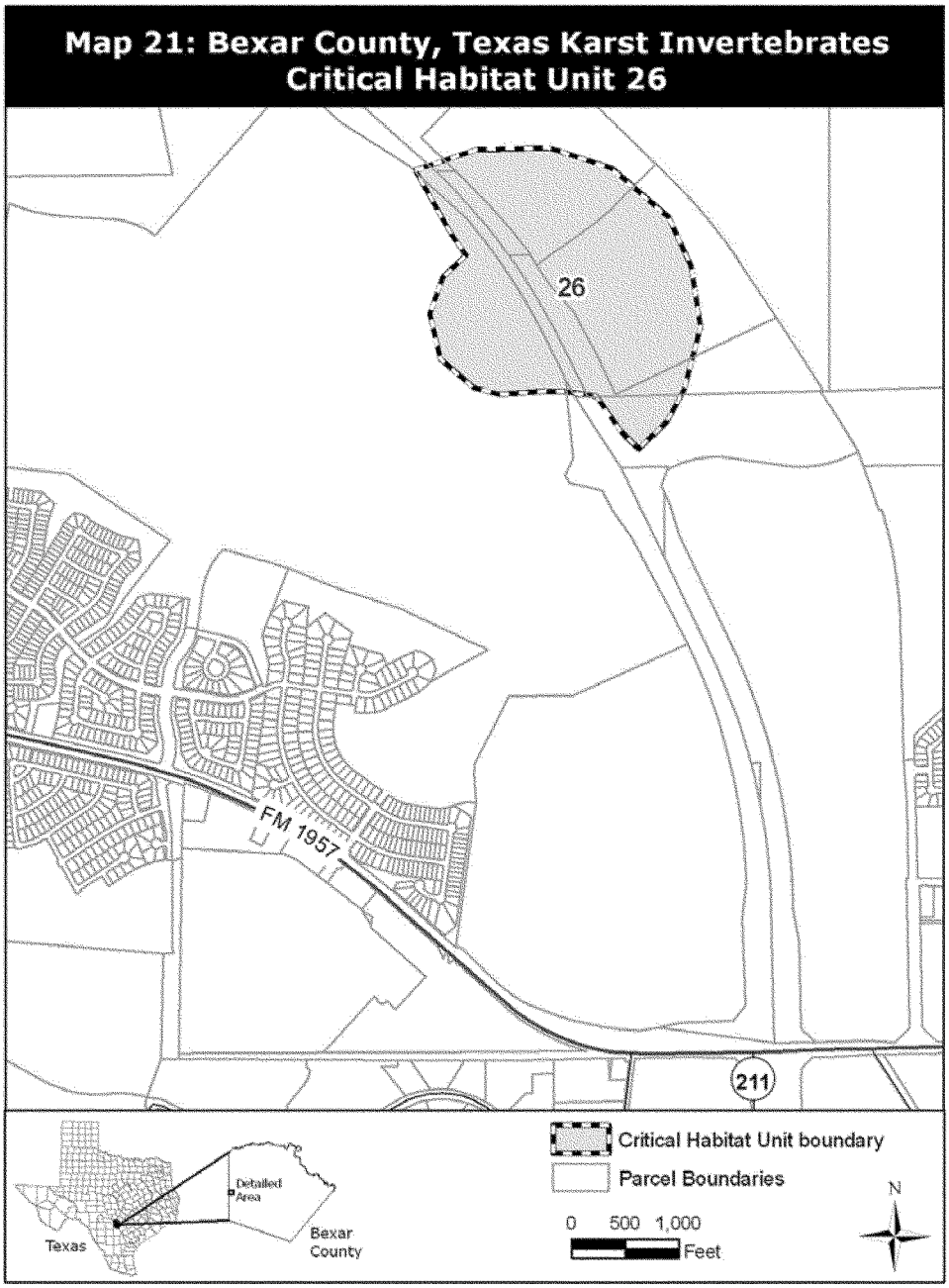
(ii) **Note:** Map 20 of Unit 23 follows:



(23) Unit 26: Bexar County, Texas.

(i) [Reserved for textual description of unit.]

(ii) **Note:** Map 21 of Unit 26 follows:



* * * * *

Dated: February 7, 2011.

Thomas L. Strickland,

Assistant Secretary for Fish and Wildlife and Parks.

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