DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AI47

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

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose designation of critical habitat for nine endangered karst-dwelling invertebrate species pursuant to the Endangered Species Act of 1973, as amended (Act). The proposed critical habitat consists of 25 units (a total of approximately 9,516 acres) in Bexar County, Texas, each encompassing one or more caves or other karst features known to contain one or more of the listed species. ''Karst'' is 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 a honeycomb (USFWS 1994). Critical habitat identifies areas that are essential to the conservation of a listed species and that may require special management considerations or protection.

If this proposal is made final, section 7 of the Act requires Federal agencies to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat to the extent that the action appreciably diminishes the value of the critical habitat for the conservation of the species. Section 4 of the Act requires us to consider economic and other impacts of specifying any particular area as critical habitat. We solicit data and comments from the public on all aspects of this proposal, including data on economic and other impacts of the designation.

DATES: We will accept comments until the close of business on November 25, 2002. Public hearing requests must be received by October 11, 2002.

ADDRESSES: If you wish to comment, you may submit your comments and materials concerning this proposal by the date given above to the Acting Field Supervisor, Austin Ecological Services Field Office, U.S. Fish and Wildlife Service, 10711 Burnet Road, Suite 200, Austin, Texas 78758.

You may also hand-deliver written comments to our U.S. Fish and Wildlife Service's Austin Ecological Services Field Office at the address given above.

You may view comments and materials received, as well as supporting documentation used in the preparation of this proposed rule, by appointment, during normal business hours in the U.S. Fish and Wildlife Service's Austin Ecological Services Field Office at the above address.

FOR FURTHER INFORMATION CONTACT: Bill Seawell, Acting Field Supervisor, U.S. Fish and Wildlife Service, Austin Ecological Services Field Office, at the above address (telephone: 512/490–0057; facsimile: 512/490–0974).

SUPPLEMENTARY INFORMATION:

Background

The following nine Bexar County, Texas, invertebrate species were listed as endangered on December 26, 2000 (65 FR 81419): *Rhadine exilis* (ground beetle, no common name); *Rhadine infernalis* (ground beetle, no common name); *Batrisodes venyivi* (Helotes mold beetle); *Texella cokendolpheri* (Cokendolpher cave harvestman); *Cicurina baronia* (Robber Baron Cave meshweaver); *Cicurina madla* (Madla Cave meshweaver); *Cicurina venii* (Braken Bat Cave meshweaver); *Cicurina vespera* (Government Canyon Bat Cave meshweaver); and *Neoleptoneta microps* (Government Canyon Bat Cave spider). All of these species are karst dwelling species of local distribution in north and northwest Bexar County. They spend their entire lives underground.

During the course of climatic changes two million to ten thousand years ago, certain creatures retreated into the more stable cave environments, while their respective surface relatives either emigrated or became extinct (Barr 1968; Mitchell and Reddell 1971; Elliott and Reddell 1989). Cave species (troglobites) survived and colonized the caves and other subterranean voids. Through faulting and canyon downcutting, the karst terrain along the Balcones Fault Zone became increasingly dissected, creating ''islands'' of karst and barriers to dispersal. These ''islands'' isolated troglobitic populations from each other, probably resulting in speciation.

Individuals of the listed species are small, ranging in length from 1 millimeter (0.039 inch (in)) to 1 centimeter (0.39 in). They are eyeless or essentially eyeless and most lack pigment. Adaptations to cave life may include adaptations to the low quantities of food in caves, including low metabolism, long legs for efficient movement, and loss of eyes, possibly as an energy-saving trade-off (Howarth 1983). They may be able to survive from months to years existing on little or no food (Howarth 1983). Adult Cicurina spiders have survived in captivity without food for about 4 months (James Cokendolpher, pers. comm., 2002).

While the life span of listed Texas troglobitic invertebrates is unknown, they are believed to live more than a year based, in part, on the amount of time some juveniles have been kept in captivity without maturing (Veni and Associates 1999; James Reddell, Texas Memorial Museum, pers. comm., 2000). James Cokendolpher (pers. comm., 2002) maintained a juvenile troglobitic *Cicurina* spider from May 1999 through April 2002. Reproductive rates of troglobites are typically low (Poulson and White 1969; Howarth 1983). Based on surveys conducted by Culver (1986), Elliott (1994a), and Hopper (2000), population sizes of troglobitic invertebrates are typically low, with most species known from only a few specimens (Culver *et al.* 2000).

The primary habitat requirements of these species include: (1) Subterranean spaces in karst with stable temperatures, high humidities (near saturation) and suitable substrates (for example, spaces between and underneath rocks suitable for foraging and sheltering), and (2) a healthy surface community of native plants and animals that provide nutrient input and, in the case of native plants, act to buffer the karst ecosystem from adverse effects (for example, non-native species invasions, contaminants, and fluctuations in temperature and humidity).

Since sunlight is absent or only present in extremely low levels in caves, most karst ecosystems depend on nutrients derived from the surface either directly (organic material brought in by animals, washed in, or deposited through root masses) or indirectly through 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; Poulson and White 1969; Howarth 1983; Culver 1986). Primary sources of nutrients include leaf litter, cave crickets, small mammals and other vertebrates that defecate or die in the cave.

The continuing expansion of the San Antonio metropolitan area in karst terrain constitutes the primary threat to the species through destruction and/or deterioration of habitat by construction; filling of caves and karst features and loss of permeable cover; contamination

from septic effluent, sewer leaks, run-off, pesticides, and other sources; exotic species (especially nonnative fire ants); and vandalism.

Subsurface Environment

These karst invertebrates require stable temperatures and constant, high humidity (Barr 1968; Mitchell 1971a) because they have lost the adaptations needed to prevent desiccation in drier habitat (Howarth 1983) and/or the ability to detect or cope with more extreme temperatures (Mitchell 1971). Temperatures in caves are typically the average annual surface temperature with little variation (Howarth 1983; Dunlap 1995). Relative humidity is typically near 100% in caves that support troglobitic invertebrates (Elliott and Reddell 1989).

During temperature extremes, the listed species may retreat into small interstitial spaces (human-inaccessible) connected to the cave, where the physical environment provides the required humidity and temperature levels (Howarth 1983). These species may spend the majority of their time in such retreats, only leaving them to forage in the larger cave passages (Howarth 1987).

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 335.5 meters (m) (1,100 feet (ft)) to 579.5 m (1,900 ft) (Veni 1988; Soil Conservation Service 1962). This portion of the Plateau is dissected by numerous small streams and is drained by Cibolo Creek and Balcones Creek. To the southeast of the Plateau lies the Balcones Fault Zone, a 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). The Edwards Limestone accounts for one-third of the cavernous rock in Bexar County, and contains 60% of the caves, making it the most cavernous unit in the County. 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% of Bexar County caves (Veni 1988). In Bexar County, the Pecan Gap Chalk, while generally not cavernous, has a greater than expected density of caves and passages (Veni 1988).

Veni (1994) delineated six karst areas (hereafter referred to as karst fauna regions) within Bexar County: Stone Oak, UTSA (University of Texas at San Antonio), Helotes, Government Canyon, Culebra Anticline, and Alamo Heights. These karst fauna regions 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.

These areas have been delineated by Veni (1994) 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. These five zones are defined as:

Zone 1: Areas known to contain one or more of the nine endangered karst invertebrates;

Zone 2: Areas having a high probability of suitable habitat for the invertebrates;

Zone 3: Areas that probably do not contain the invertebrates;

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 zone 5; and

Zone 5: Areas that do not contain the invertebrates.

Endangered Karst Invertebrate Distribution

By 2000, about 400 caves were known from Bexar County (SWCA 2000). Of these 400 caves, 57 were known to contain one or more of the nine endangered invertebrates at the time the species were listed. Currently, we are aware of 69 caves in Bexar County that contain one or more of the listed species (Table 1).

Rhadine exilis (Ground beetle—No Common Name)

The ground beetle *Rhadine exilis* (Coleoptera: Carabidae) was first collected in 1959. The species was described by Barr and Lawrence (1960) as *Agonum exile* and later assigned to the genus *Rhadine* Barr (1974). The species is currently known from 44 caves: 3 in the Government Canyon karst fauna region; 5 in the Helotes karst fauna region; 9 in the UTSA karst fauna region; and 27 in the Stone Oak karst fauna region (Table 1).

Rhadine infernalis (Ground Beetle—No Common Name)

Rhadine infernalis (Coleoptera: Carabidae) was first collected in 1959. The species was initially described by Barr and Lawrence (1960) as *Agonum infernale,* but later assigned to the genus *Rhadine* (Barr 1974). Scientists have recognized three subspecies (*Rhadine infernalis ewersi, Rhadine infernalis infernalis, Rhadine infernalis* ssp.) (Barr 1974; Barr and Lawrence 1960; Reddell 1998).

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

Species (# of caves)	Cave name	Karst fauna region
Rhadine exilis (44)	40 mm Cave B–52 Cave. Backhole. Black Cat Cave. Boneyard Pit. Bunny Hole. 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.	Stone Oak.

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

Species (# of caves)	Cave name	Karst fauna region
	Isocow Cave.	
	Kick Start Cave.	
	MARS Pit.	
	MARS Shaft.	
	Pain in the Glass 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.	
	Government Canyon Bat Cave	Government Canyon.
	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 (6) (subspecies not indicated)	Canyon Ranch Pit	Government Canyon.
	Fat Man's Nightmare Cave.	
	Scenic Overlook Cave.	
	Pig Cave.	
	San Antonio Ranch Pit.	
	Obvious Little Cave	Culebra Anticline.
R. infernalis ewersi (3)	Flying Buzzworm Cave	Stone Oak.
	Headquarters Cave.	
	Low Priority Cave.	
R. infernalis new subspecies (6)	Caracol Creek Coon Cave	Culebra Anticline.
	Game Pasture Cave No. 1.	
	Isopit.	
	King Toad Cave.	
	Stevens Ranch Trash Hole Cave.	
	Wurzbach Bat Cave.	
R. infernalis infernalis (16)	Bone Pile Cave	Government Canyon.
	Government Canyon Bat Cave.	
	Lithic Ridge Cave.	
	Surprise Sink.	
	Christmas Cave	Helotes.
	Helotes Blowhole.	
	Logan's Cave.	
	Madla's Cave.	
	Madla's Drop Cave.	
	Genesis Cave	Stone Oak.
	John Wagner Ranch Cave No. 3	UTSA.
	Kamikazi Cricket Cave.	
	Mattke Cave.	
	Robber's Cave.	
	Scorpion Cave.	
	Three Fingers Cave.	
Batrisodes venyivi (6)	Scenic Overlook Cave	Government Canyon.
	San Antonio Ranch Pit.	
	Christmas Cave	Helotes.
	Unnamed cave ½ mile N of Helotes.	
	Helotes Hilltop Cave.	
	Unnamed cave 5 miles NE of Helotes	UTSA.
Texella cokendolpheri (1)	Robber Baron Cave	Alamo Heights.
C. baronia (1)	Robber Baron Cave	Alamo Heights.
Cicurina madla (8)	Christmas Cave	Helotes.
	Madla's Cave.	

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

Species (# of caves)	Cave name	Karst fauna region
	Madla's Drop Cave.	
	Helotes Blowhole.	
	Headquarters Cave	Stone Oak.
	Hills and Dales Pit	UTSA.
	Robber's Cave.	
	Lost Pothole	Government Canyon.
C. venii (1)	Braken Bat Cave	Culebra Anticline.
C. vespera (2)	Government Canyon Bat Cave	Government Canyon.
	Unnamed cave 5 miles NE of Helotes	UTSA.
Neoleptoneta microps (2)	Government Canyon Bat Cave	Government Canyon.
	Surprise Sink.	

Rhadine infernalis ewersi is known from three caves in the Stone Oak karst fauna region. *Rhadine infernalis infernalis* is known from 16 caves: one in the Stone Oak karst fauna region, four in the Government Canyon karst fauna region, five in the Helotes karst fauna region, and six in the UTSA karst fauna region. The unnamed subspecies is known from six caves in the Culebra Anticline karst fauna region. We are also aware of six additional caves that contain *Rhadine infernalis* (not identified to subspecies): one in the Culebra Anticline karst fauna region and five in the Government Canyon karst fauna region.

Helotes Mold Beetle

The Helotes mold beetle, *Batrisodes venyivi* (Coleoptera: Pselaphidae), was first collected in 1984 and described by Chandler (1992). The species is currently known from six caves: three in the Helotes karst fauna region, two in the Government Canyon karst fauna region, and one in the UTSA karst fauna region (Table 1). The location of one of the caves located in the Helotes karst fauna region referred to as ''unnamed cave ½ mile north of Helotes'' is unknown. It is an original record from Barr's (1974) description of *Rhadine exilis*. Due to the number of caves in the general area, the location of this cave cannot be positively identified (George Veni, George Veni & Associates, pers. comm. 2002). The location of the cave in the UTSA karst fauna region referred to as a cave ''5 miles NE of Helotes'' is also unknown, but based on its descriptive name, is assumed to be within the UTSA karst fauna region. It is possible that this cave may not be a separate location, but may be an existing cave listed by the collector under the alternative name ''5 miles NE of Helotes''.

The common names for the following six arachnid species have been changed as a result of a meeting of the Committee on Common Names of Arachnids of the American Arachnological Society in 2000. Accordingly, the common names of the species currently in the list of Endangered and Threatened Wildlife (50 CFR 17.11) as: Robber Baron Cave harvestman, Robber Baron cave spider, Madla's cave spider, vesper cave spider, Government Canyon cave spider, and one with no common name (Cicurina venii), have been changed to: Cokendolpher cave harvestman, Robber Baron Cave meshweaver, Madla Cave meshweaver, Government Canyon Bat Cave meshweaver, Government Canyon Bat Cave spider, and Braken Bat Cave meshweaver, respectively.

Cokendolpher Cave Harvestman

The Cokendolpher cave harvestman, *Texella cokendolpheri* (Opilionida: Phalangodidae), was collected in 1982 and described by Ubick and Briggs (1992). Currently, this species, along with the Robber Baron Cave meshweaver, is only known from Robber Baron Cave (Table 1).

Robber Baron Cave Meshweaver

The Robber Baron Cave meshweaver, Cicurina baronia (Araneae: Dictynidae), was first collected in Robber Baron Cave in the Alamo Heights karst fauna region February 28, 1969, by R. Bartholomew (Reddell 1993) and described by Gertsch (1992). The Robber Baron Cave meshweaver (a spider) is only known from Robber Baron Cave in the Alamo Heights karst fauna region (Table 1).

Madla Cave Meshweaver

The Madla Cave meshweaver, *Cicurina madla* (Araneae: Dictynidae), was first collected in October 4, 1963, by J. Reddell and D. McKenzie (Reddell 1993) and described by Gertsch (1992). The Madla Cave meshweaver is currently known from eight caves: one in the Stone Oak karst fauna region; one in the Government Canyon karst fauna region; two in the UTSA karst fauna region; and four in the Helotes karst fauna region (Table 1).

The Service is aware of eleven additional caves from which immature, eyeless troglobitic *Cicurina* spiders have been collected (SWCA 2001). Eight of these are in caves that have other listed species and are either included in proposed critical habitat areas or areas proposed for exclusion due to the provision of special management. The remaining three are in caves where authorization for take of *C. madla* was granted to La Cantera under a section 10(a)(1)(B) permit.

Braken Bat Cave Meshweaver

The Braken Bat Cave meshweaver, *Cicurina venii* (Araneae: Dictynidae), was first collected on November 22, 1980, by G. Veni and described by Gertsch (1992). Braken Bat Cave in the Culebra Anticline karst fauna region remains the only location known to contain this species (Table 1).

Government Canyon Bat Cave Meshweaver

The Government Canyon Bat Cave meshweaver, *Cicurina vespera* (Araneae: Dictynidae), was first collected on August 11, 1965, by J. Reddell and J. Fish (Reddell 1993), and described by Gertsch (1992). The species is currently known from Government Canyon Bat Cave in the Government Canyon karst fauna region and an unnamed cave referred to as ''5 miles northeast of Helotes'' (Table 1). However, the specimen collected from the latter cave has been tentatively identified as a new species (Cokendolpher, in press).

Government Canyon Bat Cave Spider

The Government Canyon Bat Cave spider, *Neoleptoneta microps* (Araneae: Leptonetidae), was first collected on August 11, 1965, by J. Reddell and J. Fish (Reddell 1993). The species was originally described by Gertsch (1974) as *Leptoneta microps* and later

reassigned to *Neoleptoneta* following Brignoli (1977) and Platnick (1986). The species is known from two caves in the Government Canyon karst fauna region (Table 1).

Animal Community

Cave Crickets

Cave crickets are a critical source of nutrient input for karst ecosystems (Barr 1968; Reddell 1993). Cave crickets in the genus *Ceuthophilus* occur in most caves in Texas (Reddell 1966). Being sensitive to temperature extremes and drying, cave crickets forage on the surface at night and roost in the cave during the day. Cave crickets lay their eggs in the cave, providing food for a variety of other species (Mitchell 1971b). Some cave species also feed on cave cricket feces (Barr 1968; Poulson *et al.* 1995) as well as on adults and nymphs directly (Cokendolpher, in press; Elliott 1994a). Cave crickets are scavengers or detritivores, feeding on dead insects, carrion and some fruits, but not on foliage (Elliott 1994a).

Based on analysis of cave cricket data collected at Lakeline Cave in northwest Travis County, Texas by William Elliott and Peter Sprouse from 1993 to 1999, cave cricket numbers in Lakeline Cave underwent a major decline following the construction of Lakeline Mall. Under a section 10(a)(1)(B) permit, 0.9 ha (2.3 ac) of land was left undeveloped around the cave, and effects of the development were monitored. Protected areas were established around Temples of Thor, Red Crevice Cave, and Testudo Tube. During the monitoring period, the undeveloped area around Lakeline Cave comprised about 3.2 ha (8 ac) of woodland and grassland surrounded by roads and parking lots. The protected areas around Temples of Thor Cave and Testudo Tube Cave are 42.5 and 10.5 ha, respectively (105 and 26 ac), and one surrounded by additional undeveloped land. We analyzed cave cricket numbers from data collected from 1993 to 1999 at Lakeline Cave, Temples of Thor, and Testudo Tube. The analysis indicated that cave cricket numbers in Lakeline Cave declined while numbers at the other two caves remained stable. Cave cricket numbers at Lakeline Cave declined and were significantly correlated with time ($r^2 = 0.3872$) whereas cricket numbers from Temples of Thor and Testudo Tube, which are in larger preserves (105 and 26 acres respectively, although the surrounding undeveloped area made the effective area larger) remained stable ($r^2 = 0.0007$ and 0.0018 respectively). These results are consistent with reports of declines and extinctions of several invertebrates and small mammals (due to lower survivorship, higher emigration, and/or lower immigration) from habitat patches ranging in size from 2 to 7 ha (5–17 ac) (Mader 1984; Tscharntke 1992; Keith *et al.* 1993; Lindenmayer and Possingham 1995; Hill *et al.* 1996).

Elliott (1994a) stated that cave crickets generally forage within 50 m (164 ft) of caves and other karst features, but have been found up to 60 m (197 ft) away. He also stated that cave crickets may use small, unnoticeable passages from the cave to the surface in addition to the main cave entrance.

Cave cricket populations may have a metapopulation (an assemblage of local populations, called subpopulations, that interact via the dispersal of individuals from one subpopulation to others) or a source-sink population structure and, therefore, it may be important to protect multiple karst features that support cave crickets in a karst ecosystem. ''Source'' populations are those that generate a flow of migrants to other habitat patches. Population ''sinks'' are patches where losses of individuals are not replaced by reproduction alone, but rely on continued immigration from source populations (Ehrlich and Ehrlich 1996). Metapopulation dynamics require movement among patches, and persistence requires interacting patches that undergo local extinctions and establishment of new subpopulations in areas previously devoid of individuals (Hanski 1999).

Most information on the population structure of cave cricket species is from studies in the eastern United States and in Europe. Allegrucci *et al.* (1997) found that a cave cricket (*Dolichopoda schiavazzii*) endemic to Tuscany, Italy, had a metapopulation structure. They found that populations of cave crickets from two caves 20 km (12 mi) apart but connected by moist woodlands had 54 migrants per generation and probably exchanged individuals.

Cockley *et al.* (1977) studied a cave cricket (*Ceuthophilus gracilipes*) in the eastern United States. This species is limited to humid, dark, and stable habitats and is found both in caves and in the forest under logs and loose bark. They found limited genetic differentiation of the cave crickets in caves over a 1000 km2 (386 mile2) area and suggested that ''the forest populations may serve as genetic bridges'' between caves.

Caccone and Sbordoni (1987) studied nine species of North American cave crickets from sites in North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, Kentucky, and Alabama. Seven of the species were obligate cave-dwelling species that emerged at night to feed. Through genetic analyses of the cave-dwelling species, they found that species or groups of populations inhabiting areas where the limestone is continuous and highly fissured are genetically less differentiated than are populations occurring in regions where the limestone distribution is more fragmented. This suggests that cave-dwelling species occurring within continuous limestone blocks migrate through the subsurface environment.

Helf *et al.* (1995) suggested that populations of an eastern species of cave cricket (*Hadenoecus subterraneus*) may be at risk because they do not recover quickly after events such as drought, floods, and temperature extremes that preclude or diminish foraging opportunities. These cave cricket populations may have source-sink population dynamics, with some karst features acting as sources and the majority of karst features acting as sinks, but Helf *et al.* (1995) recommend that even sink populations should be protected because their emigrants can ''rescue'' source populations that experience local decimation. These studies suggest that it is important to protect geologically connected caves and maintain vegetated corridors between caves.

Other Surface Animals

Many central Texas caves with endangered invertebrate species are frequented by mammals and several species of reptiles and amphibians (Reddell 1967). Although there are no studies establishing the role of mammals in central Texas cave ecology, the presence of a large amount of mammal related materials (scat, nesting materials, and dead bodies) indicates they are probably important. An important source of nutrients for the cave species may be the fungus, microbes, and/or other troglophiles and troglobites that grow or feed on feces (Elliott 1994b; Gounot 1994).

For predatory troglobites, invertebrates that accidently occur in the cave, may be an important nutrient source (Hopper 2000). 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; Reddell 1966; Reddell 1999).

Vegetation Community

The vegetative community provides nutrient input to the karst ecosystem through plant debris washed in and possibly through roots; supports the animal communities that contribute nutrients to the karst ecosystem (such as cave crickets, small mammals, and other vertebrates); buffers the subsurface environment against drastic changes in the temperature and moisture regime; helps filter pollutants (Biological Advisory Team 1990; Veni & Associates 1988); and helps control certain exotics (such as fire ants) (Porter *et al.* 1988) that may compete with or prey upon the listed species and other karst fauna.

Tree roots have been found to provide a major energy source in shallow lava tubes and limestone caves in Hawaii (Howarth 1981, cited in Howarth 1983). Jackson *et al.* (1999) 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 penetrating up to 25 m (82 ft) into the interior of twenty of the caves, with roots of six tree species common to the plateau penetrating to below 5 m (16.4 ft). They speculated that the caves may provide water and nutrients for the trees.

Along with providing nutrients to the karst ecosystem, directly and indirectly, a healthy vegetative community may also help control the spread of exotic species. The imported red fire ant (*Solenopsis invicta*) 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; Porter and Savignano 1990) and is a threat to the karst invertebrates (Elliott 1994b; USFWS 1994). 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 listed karst invertebrates makes them especially vulnerable to invasion by fire ants and other exotic species. Fire ants have been observed preying on several cave species (Elliott 1994b). Karst fauna that are most vulnerable to fire ant predation are the slower-moving adults, nymphs, and eggs (James Reddell, pers. comm., 1994). 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.

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). Porter *et al.* (1991) state that control of fire ants in areas greater than 5 ha (12 ac) may be more effective than in smaller areas since 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; 1991).

Woodland-Grassland Community

The woodland-grassland mosaic community typical of the Edwards Plateau is a patchy environment composed of many different plant species. To replicate natural processes, patchy environments require larger minimum areas for conservation than do more homogeneous environments (Lovejoy and Oren 1981). To maintain a viable vegetative community, including woodland and grassland species, a buffer area is needed to shield the core habitat from impacts associated with fragmentation, isolation, edge effects, and other factors.

Enough individuals of each plant species must be present for successful reproduction over the long-term. Viable population size is influenced by needs for satisfactory germination (Menges 1995), genetic variation (Bazzaz 1983; Menges 1995; Young 1995) and pollinator effectiveness (Groom 1998; Jennersten 1995; Bigger 1999). Pavlik (1996) stated that long-lived, woody, self-fertilizing plants with high fecundity would be expected to have minimum viable population sizes in the range of 50–250 reproductive individuals. Fifty reproductive individuals is a reasonable minimum figure for one of the dominant species of the community (juniper) based on reproductive profiles for these species (Van Auken *et al.* 1979; Van Auken *et al.* 1980; Van Auken *et al.* 1981). This figure would likely be an underestimate for other woody species present in central Texas woodlands as subdominant and understory species, because they 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 these species may require population sizes at the higher end of Pavlik's (1996) range (that is, nearer 250 individuals) to be viable, we do not have the data to support that contention. Therefore, we have considered a minimum viable population size for species composing a typical oak/juniper woodland found in central Texas, including both dominant, subdominant, and understory species, to be 80 individuals per species (Dr. Kathryn Kennedy, Center for Plant Conservation, pers. comm., 2002). This is a judgement based on the perception that this habitat type as a whole is fairly mature and the species are relatively long-lived and reproductively successful.

Based on analysis of recorded densities for dominant and important woody species by Van Auken *et al.* (1979; 1980; 1981), we extrapolated the area needed to support 80 reproductive individuals for the dominant, subdominant, and other important woody species in the southern Edwards Plateau. We used observed density per unit area, corrected for non-reproductive individuals, then calculated the area needed to support 80 mature reproductive individuals per species. We found about a third of the ecologically important woody species typical of the Edwards Plateau needed core areas of approximately 32 ha (80 ac) to sustain self-reproducing populations of at least 80 mature individuals.

Maintaining viable grasslands is challenging because many grass species use wind to disperse their seeds and these distances may be small. The process of expansion through rhizomes (underground stems) is slow and clonal, which reduces genetic variability. Primary recruitment of new individuals in grasslands is from seedling establishment. Seed dispersal, soil texture, and suitable soil moisture profiles at critical times are important factors for maintaining viability (Coffin *et al.* 1993).

While grassland may be important to maintaining the karst community, we lack adequate information to factor this information into surface habitat patch size requirements. We believe maintaining the 32 ha core areas will provide the native grasslands needed to support the diversity and nutrients needed for a viable karst ecosystem.

The presence of water in the subsurface environment is important for maintaining the humid conditions, stable temperatures, and natural airflow in the cave. Since soil depth is shallow over the limestone plateau, water collects as sheet flow on the surface following rain and enters the subsurface environment through cave openings, fractures, and solutionally-enlarged bedding planes. This direct, rapid transport of water through the karst allows for little or no purification (USFWS 1994), allowing contaminants and sediments to enter directly into the subsurface environment. As a result, karst features and karst dependent invertebrates are vulnerable to the

adverse effects of pollution from contaminated ground and surface water. Maintaining stable environmental conditions and protecting groundwater quality and quantity, requires managing surface habitat to avoid threats to the surface and subsurface drainage area of known occupied caves. This includes not only the humanly-accessible cave entrances but also sinks, depressions, fractures and fissures which may serve as subsurface conduits into the cave and to the interstitial spaces used by the invertebrates.

Buffer Areas

Plant and animal communities are affected by ''edge effects'' or changes to the floral and faunal communities where different habitats meet. The length and width of the edge, as well as the contrast between the vegetational communities, all contribute to edge effects (Smith 1990; Harris 1984). Edge effects include: increases in solar radiation, changes in soil moisture due to elevated levels of evapotranspiration, wind buffeting (Ranny *et al.* 1981), changes in nutrient cycling and the hydrological cycle (Saunders *et al.* 1990), and changes in the rate of leaf litter decomposition (Didham 1998). Edge effects alter the plant communities, which in turn impact the associated animal species. The changes caused by edge effects can occur rapidly. For example, vegetation 2 m (6.6 ft) from a newly created edge can be altered within days (Lovejoy *et al.* 1986).

When plant species composition is altered due to edge effects, changes also occur in the surface animal communities (Lovejoy and Oren 1981; Harris 1984; Mader 1984; Thompson 1985; Lovejoy *et al.* 1986; Yahner 1988; Fajer *et al.* 1989; Kindvall 1992; Tscharntke 1992; Keith *et al.* 1993; Hanski 1995; Lindenmayer and Possingham 1995; Bowers *et al.* 1996; Hill *et al.* 1996; Kozlov 1996; Kuussaari *et al.* 1996; Turner 1996; Mankin and Warner 1997; Burke and Nol 1998; Didham 1998; Suarez *et al.* 1998; Crist and Ahern 1999; Kindvall 1999). These changes in plant and animal species composition that result from edge effects may unnaturally change the nutrient cycling processes required to support cave and karst ecosystem dynamics. To minimize edge effects, the core area must have a sufficient buffer area.

There are two types of edges, hard and soft. ''Hard'' edges, also called inherent edges, are drastic differences in habitat types, such as grassland to road, forest to clearcut, and are generally long-term or permanent changes. Hard edges can be the result of a sudden natural disruption such as a storm event (Smith 1990), or man-made disturbances such as clearcuts or urbanization. ''Soft'' edges, also called induced edges, are subtle differences in habitat type. Soft edges can also be abrupt such as where a pine forest abuts a pine plantation, but soft edges occur more often as successional changes or gradual transitions in the vegetative or faunal communities (Smith 1990).

Hard edges can act as a barrier to distribution and dispersal patterns of birds and mammals (Yahner 1988; Hansson 1998). Invertebrate species are affected by edges. Mader *et al.* (1990) found that carabid beetles and lycosid spiders avoided crossing unpaved roads that were even smaller than 3 m (9 ft) wide. Saunders *et al.* (1990) suggested that as little as 100 m (328 ft) of agricultural fields may be a complete barrier to dispersal for small organisms such as invertebrates and some species of birds. In general, for animal communities, species need buffers of 50 to 100 m (164–328 ft) or greater to ameliorate edge effects (Lovejoy *et al.* 1986; Wilcove *et al.* 1986; Laurance 1991; Laurance and Yensen 1991; Kapos *et al.* 1993; Andren 1995; Reed *et al.* 1996; Burke and Nol 1998; Didham 1998; Suarez *et al.* 1998).

Non-native fire ants are known to be harmful to many species of invertebrates and vertebrates. In coastal southern California, Suarez *et al.* (1998) found that densities of the exotic Argentine ant (*Linepithema humile*), which has a life history similar to the fire ant, 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 200 m (656 ft) (Suarez *et al.* 1998).

Both hard and soft edges may allow invasive plant species to gain a foothold where the native vegetation had previously prevented their spread (Saunders *et al.* 1990; Kotanen *et al.* 1998; Suarez *et al.* 1998; Meiners and Steward 1999). A general rule for protecting forested areas from edge effects that are in proximity to clear-cut areas is to use the ''three tree height'' rule (Harris 1984) for estimating the width of the buffer area needed. We used this general rule to estimate the width of buffer areas needed to protect the habitat core areas. The average height of native mature trees in the Edwards woodland association in Texas ranges from 3 to 9 m (10 to 30 ft) (Van Auken *et al.* 1979). Applying the general rule, and using the average value of 6.6 m for tree height, we estimated a buffer width of at least 20 m (66 ft) is needed around a core habitat area to protect the vegetative community from edge effects.

Patch Configuration

Shape

The more edge a habitat fragment or patch has, the larger the patch or fragment size should be to protect the core area from deleterious edge effects (Ranny *et al.* 1981; Lovejoy *et al.* 1986; Yahner 1988; Laurance 1991; Laurance and Yensen 1991; Kelly and Rotenberry 1993; Holmes *et al.* 1994; Reed *et al.* 1996; Turner 1996; Suarez *et al.* 1998). Designing a habitat area that minimizes edge effects means keeping the edge to area ratio low by increasing the patch size (Holmes *et al.* 1994) and/or using optimal shapes. Circular habitat areas, or ones that are contiguous with other protected habitat areas, are preferable (Diamond 1975; Wilcove *et al.* 1986; Kelly and Rotenberry 1993; Wigley and Roberts 1997; Kindvall 1999). A habitat area with a circular configuration will have less edge than a habitat area of equal size with any other configuration.

Fragmentation

Haskell (2000) examined the effect of habitat fragmentation by unpaved roads through otherwise contiguous forest in the southern Appalachian Mountains and found reduced soil macroinvertebrate species abundance up to 100 m (328 ft) from the road and declines in faunal richness up to 15 m (50 ft) from the road. Haskell (2000) pointed out that ''these changes may have additional consequences for the functioning of the forest ecosystem and the biological diversity found within this system. The macroinvertebrate fauna of the leaf litter plays a pivotal role in the ability of the soil to process energy and nutrients.'' Haskell further points out that these changes may in turn affect the distribution and abundance of other organisms, particularly plants. Changes in abundance in litter dwelling macroinvertebrates may also affect ground-foraging vertebrate fauna (Haskell 2000).

Invertebrate biomass per unit area has been found to be less in small fragmented habitats, which may result in reduced food available for cave crickets. Burke and Nol (1998), working in southern Ontario, Canada, found a greater biomass of leaf litter invertebrates in large (≥20 ha (49 ac)) versus smaller forested areas. Zanette *et*

al. (2000) in New South Wales, Australia, reported the biomass of ground dwelling invertebrates was 1.6 times greater in large (>400 ha (988 ac)) versus smaller (~55 ha (136 ac)) forested areas.

The ability of individuals to move between preferred habitat patches is essential for colonization and population viability (Eber and Brandl 1996; Fahrig and Merriam 1994; Hill *et al.* 1996; Kattan *et al.* 1994; Kindvall 1999; Kozlov 1996; Kuussaari *et al.* 1996; Turner 1996). Patch shapes that allow connection with the most number of neighboring patches increase the likelihood that a neighboring patch will be occupied (Fahrig and Merriam 1994; Kindvall 1999; Kuussaari *et al.* 1996; Tiebout and Anderson 1997). 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).

It is likely that many cave systems are connected throughout the subsurface geologic formation even though this may not be readily apparent from surface observations. The extent to which listed species use interstitial spaces and passages is not fully known. Troglobitic species may retreat into these small interstitial spaces where the physical environment is more stable (Howarth 1983) and may spend the majority of their time in such retreats, only leaving them during temporary forays into the larger cave passages to forage (Howarth 1987).

Summary

The recovery of the endangered karst invertebrates depends on a self-sustaining karst ecosystem; surface and subsurface drainage basins to maintain adequate levels 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 core area buffered from the impacts associated with fragmentation, isolation, edge effects, and other factors that may threaten ecosystem stability. Depending on the size and shape of these core habitat areas or patches, to remain viable, they may also require connections to other habitat patches.

In summary, around known caves we believe an area approximately 36 ha (90 ac) that includes a core habitat area of 32 ha (80 ac) surrounded by a buffer 20 m (66 ft) wide, comprising about 4 ha (10 ac), is needed to protect and maintain the area flora, fauna, and nutrient base. The amount of area in the buffer will be larger if the core habitat area is irregularly shaped. Where possible, these areas should be continuous to minimize fragmentation.

Previous Federal Action

On January 16, 1992, we received a petition submitted by representatives of the Helotes Creek Association, the Balcones Canyonlands Conservation Coalition, the Texas Speleological Association, the Alamo Group of the Sierra Club, and the Texas Cave Management Association to add the nine invertebrates to the List of Threatened and Endangered Wildlife. On December 1, 1993, we announced in the **Federal Register** (58 FR 63328) a 90-day finding that the petition presented substantial information that listing may be warranted.

On November 15, 1994, we added eight of the nine invertebrates to the Animal Notice of Review as category 2 candidate species in the **Federal Register** (59 FR 58982). We intended to include *Rhadine exilis* in the notice of review, but an oversight occurred and it did not appear in the published notice. Category 2 candidates, a classification since discontinued, were those taxa for which we had data indicating that listing was possibly appropriate, but for which we lacked substantial data on biological vulnerability and threats to support proposed listing rules.

On December 30, 1998, we published a proposed rule to list the nine Bexar County karst invertebrates as endangered (63 FR 71855). Incorporating comments and new information received during the public comment period on the proposed rule, we published a final rule to list the nine Bexar County karst invertebrate species as endangered in the **Federal Register** on December 26, 2000 (65 FR 81419).

In the proposed rule, we indicated that designation of critical habitat was not prudent for the nine invertebrates because the publication of precise species locations and maps and descriptions of critical habitat in the **Federal Register** would make the nine invertebrates more vulnerable to incidents of vandalism through increased recreational visits to their cave habitat and through purposeful destruction of the caves. We also indicated that designation of critical habitat was not prudent because it would not provide any additional benefits beyond that provided through listing the species as endangered.

Based on recent court decisions, (for example, *Natural Resources Defense Council* v. *U.S. Department of the Interior* 113 F. 3d 1121 (9th Cir. 1997); *Conservation Council for Hawaii* v. *Babbitt,* 2 F. Supp. 2d 1280 (D. Hawaii 1998)) and the standards applied in those judicial opinions, we reexamined the question of whether critical habitat for the nine invertebrates would be prudent. After reexamining the available evidence for the nine invertebrates, we did not find specific evidence of collection or trade of these or any similarly situated species and found that ''by designating critical habitat in a manner that does not identify specific cave locations, the threat of vandalism by recreational visits to the cave or purposeful destruction by unknown parties should not be increased'' (65 FR 81419).

In the final rule to list the species as endangered (65 FR 81419), we determined that critical habitat designation was prudent as we did not find specific evidence of increased vandalism. Also, we found that there may also be some educational or informational benefit to designating critical habitat. Therefore, we found that the benefits of designating critical habitat for the nine karst invertebrate species outweighed the benefits of not designating critical habitat.

The Final Listing Priority Guidance for FY 2000 (64 FR 57114) stated that we would undertake critical habitat determinations and designations during FY 2000 as allowed by our funding allocation for that year. As explained in detail in the Listing Priority Guidance, our listing budget was insufficient to allow us to immediately complete all of the listing actions required by the Act during FY 2000. We stated that we would propose designation of critical habitat in the future at such time when our available resources and priorities allowed.

On November 1, 2000, the Center for Biological Diversity (Center) filed a complaint against the Service alleging that the Service exceeded its one-year deadline to publish a final rule listing and designating critical habitat for the nine Bexar County cave invertebrates. Subsequent to the Service publishing the final rule to list these nine species as endangered on December 26, 2000, the Center agreed to dismiss its claim regarding the listing of the species. The Center and the Service reached a settlement on the designation of critical habitat where the Service agreed to submit a proposed critical habitat determination for publication in the **Federal Register** on or by June 30, 2002, and a final determination by January 25, 2003. Sixty-day extensions on the deadlines to submit both the proposed and final critical habitat determinations to the **Federal Register** were approved by the court and the new deadlines are

August 31, 2002, and March 25, 2003, respectively.

On February 28, 2002, we mailed letters to the Texas Parks and Wildlife Department and the Texas Natural Resource Conservation Commission informing them that we were in the process of designating critical habitat for the nine Bexar County karst invertebrates. We requested any additional available information on the listed species, including: Biology; life history; habitat requirements; distribution, including geologic controls to species distribution; current threats; and management activities, current or in the foreseeable future. The letters contained a current list of Bexar County caves known to contain listed species, a map showing the general distribution of these species within each karst fauna region and a list of the references pertaining to these species and their distribution as we know it. We requested their review and comments on our current information and asked their assistance in providing any additional available information.

We also mailed approximately 300 pre-proposal letters to interested parties and cave biologists on March 20, 2002, informing them that we were in the process of designating critical habitat for the nine listed karst invertebrates. The letters contained a copy of the final rule to list these Bexar County invertebrate species as endangered, a map showing the general distribution of these species, a list of literature about these species and their habitats, and a brief summary with questions and answers on critical habitat. We requested comments on (1) the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act, including whether the benefits of excluding areas will outweigh the benefits of including areas; (2) land use practices and current or planned activities in the subject areas and their possible impacts on possible critical habitat; (3) any foreseeable economic or other impacts resulting from the proposed designation of critical habitat, in particular, any impacts on small entities or families; and (4) economic and other benefits associated with designating critical habitat for the Bexar County karst invertebrates.

Critical Habitat

Critical habitat is defined in section 3, paragraph (5)(A) of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and, (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. ''Conservation,'' as defined by the Act, means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Destruction or adverse modification is direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical. Consultation under section 7 of the Act does not apply to activities on private or other non-Federal lands that do not involve a Federal nexus.

Critical habitat provides non-regulatory benefits to the species by informing the public and private sectors of areas that are important for species recovery and where conservation actions would be most effective. Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features that are essential for the conservation of that species, and can alert the public and land-managing agencies to the importance of those areas.

To be included in a critical habitat designation, the habitat must be ''essential to the conservation of the species.'' Critical habitat designations identify, to the extent known and using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (such as areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)). Section 3(5)(C) of the Act states that not all areas that can be occupied by a species should be designated as critical habitat unless the Secretary determines that all such areas are essential to the conservation of the species. Our regulations (50 CFR 424.12(e)) also state that, '''The Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species.'''

Section 4 (b)(2) of the Act requires that we take into consideration the economic impact, and any other relevant impact, of specifying any particular areas as critical habitat. We may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Our Policy on Information Standards Under the Endangered Species Act, published on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that decisions made by the Service represent the best scientific and commercial data available. It requires that our biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, use primary and original sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information should be the listing rule for the species. Additional information may be obtained from a recovery plan, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, and biological assessments or other unpublished reports.

Section 4 of the Act requires that we designate critical habitat based on what we know at the time of designation. Since much of the cave-forming rock is located on private property in areas that have been inadequately surveyed, additional populations for some of these species are likely to exist and may be discovered over time. We recognize that designation of critical habitat for these species likely does not include all of the habitat areas that may eventually be determined to be necessary for the recovery of the species. For these reasons, this critical habitat designation does not signal that habitat outside the designation is unimportant or may not be required for recovery. Habitat areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, and the section 9 take prohibition, as determined on the basis of the best available information at the

time of the action. It is possible that federally funded or assisted projects affecting listed species outside their designated critical habitat areas could jeopardize those species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation may not totally coincide with the direction and substance of future recovery plans, habitat conservation plans (HCP), or other species conservation planning and recovery efforts if new information shows changes are needed.

Methods

As required by the Act and regulations (section 4(b)(2) and 50 CFR 424.12), we used the best scientific and commercial information available to determine critical habitat areas that contain the physical and biological features that are essential for the conservation of these nine species. This information included: (1) Peer-reviewed scientific publications; (2) the final listing rule for the nine Bexar County karst invertebrate species (65 FR 81419); (3) unpublished field data collected by Service biologists; (4) unpublished survey reports, notes and communications with other qualified biologists or experts; (5) published descriptions of the regional geology (Veni 1988; Soil Conservation Service 1962; Veni 1994); (6) the Endangered Species Recovery Plan for Endangered Karst Invertebrates in Travis and Williamson Counties, Texas, (USFWS 1994); and (7) digital orthophotographs flown in March 2001 obtained from the Bexar County Appraisal District.

In determining the areas in Bexar County that are essential to the conservation of the listed invertebrates, we considered all karst features currently known to be occupied and the surrounding surface ecosystem on which the species depend. We believe that other occupied karst features likely exist in Bexar County that are essential to species survival, especially for those species known from only a few locations (such as *Cicurina vespera, Cicurina venii, Batrisoides venyivi*, and *Neoleptoneta microps*). However, we do not currently know where these locations are and therefore cannot include them in this critical habitat designation.

Primary Constituent Elements

We are required to consider those physical and biological features essential to the conservation of these nine karst invertebrates that may require special management considerations and protection. These features are termed primary constituent elements. Primary constituent elements include but are not limited to: space for individual and population growth and for normal behavior; food, water, air, minerals and other nutritional or physiological requirements; cover or shelter; and habitats that are protected from disturbance and represent the historic geographical and ecological distributions of the species.

The primary constituent elements required by the nine karst invertebrates consist of: (1) The physical features of karst-forming rock containing subterranean spaces with stable temperatures, high humidities (near saturation) and suitable substrates (for example, spaces between and underneath rocks suitable for foraging and sheltering), and (2) the biological features of a healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) surrounding the karst feature that provides nutrient input and buffers the karst ecosystem from adverse effects (from, for example, non-native species invasions, contaminants, and fluctuations in temperature and humidity).

The areas proposed as critical habitat for the nine karst invertebrates are designed to incorporate what is essential for their conservation. Habitat components that are essential for these species meet the primary biological needs of foraging, reproduction and refugia from human induced or other environmental threats. Karst ecosystems surrounded by a vegetative community that supports cave crickets and other trogloxenes and troglophiles; where water quality and quantity in the surface and subsurface drainage basin are protected; and that are protected from unrestricted human-entry and other threats (such as fire ants) are essential for the conservation of viable populations of these endangered karst invertebrates.

Criteria Used To Delineate Critical Habitat

We used several criteria to identify and delineate lands for designation as critical habitat: caves known to contain one or more of the nine endangered karst invertebrates; the footprint of the known occupied cave, including the known and estimated subsurface extent; contiguous karst deposits; and at least 36 ha (90 ac) of vegetation surrounding each known occupied cave or complex of caves essential to the functioning of a healthy ecosystem.

Species location information was obtained from 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, section 6 species status reports, and literature published in peer reviewed journals. Survey reports and scientific permit annual reports also contained cave location information, typically in the form of a cave location indicated on a U.S. Geological Survey topographic maps, and a map of the cave footprint. We submitted a request to the Texas Speleological Survey (TSS) for any available digital location data (UTM coordinates) for Bexar County caves known to contain one or more of the nine endangered species. TSS is a non-profit corporation established in 1961 to collect, organize, and maintain information on Texas caves and karst for scientific, educational, and conservation purposes, and to support safe and responsible cave exploration, and is affiliated with the Texas Memorial Museum, the Texas Speleological Association, and the National Speleological Society. TSS provided all available digital location data, and reviewed and confirmed our location data for caves where no digital information was available. The precision of the locations for which digital location data were available ranged from 1 m to 10 m (3ft to 33 ft) and data documented on topographic maps was estimated to be accurate to within 10 m to 20 m (33 ft to 66 ft). This variability in precision was taken into account when delineating proposed boundaries. The TSS provided digital location information to us based on our agreement that the information would only be accessible to the Austin Ecological Services Field Office staff and would not be released. We further agreed that any requests for such information would be directed to TSS as owners of the data. The location of the known occupied caves within each unit is not specified in order to protect these caves from vandalism.

We referred to Veni's 1994 karst zones maps to ensure that the majority of the lands within each proposed unit overlaid a contiguous deposit of karst-bearing rock either known to contain the listed species (Zone 1) and/or having a high probability of suitable habitat for the listed species (Zone 2) in order to maintain subsurface connectivity for species movement throughout the contiguous karst deposit. Since the 1994 report, a significant amount of additional information has become available, either as a result of the discovery of new caves containing the listed species, or additional biological surveys conducted in previously

mapped caves and/or as a result of the release of information not available at the time of the 1994 report. As a result, some of these caves for which critical habitat is being proposed are depicted as occurring within Zone 2. These areas of Zone 2 now meet the definition of Zone 1. See the previous ''Subsurface Environment'' section for definitions of Veni's karst zones.

Where possible, the proposed critical habitat units contain at least 36 ha (90 ac) of self-reproducing native vegetated area surrounding each known occupied cave or complex of caves. This vegetated area includes a core vegetative community, cave cricket foraging area; and buffer areas that protect the core habitat from impacts associated with fragmentation, isolation, and edge effects. This area also includes the local surface and subsurface drainage areas, to the extent known.

We consulted recent digital orthophotographs (March 2001) and parcel maps (generated in early 2002) obtained from the Bexar County Appraisal District to determine the current status of habitat surrounding the known occupied caves and the extent of fragmentation caused by existing development within and adjacent to each habitat area. Several units were enlarged to encompass undisturbed vegetated areas to compensate for internal fragmentation due to existing development. Where possible, boundary lines were drawn along identifiable landmarks including roads, named creeks and rivers, and property boundaries. Several units were described as a circular area encompassed within a square or rectangle bounded by corner points given in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83). Coordinates were derived from the 2001 digital orthophotographs. A description of each unit and the current status of the lands in and around the unit are presented below under ''Proposed Critical Habitat Unit Descriptions''.

Existing human-constructed, above ground, impervious structures and associated landscaping within the boundaries of mapped units do not contain the primary constituent elements and are not considered to be critical habitat. Such features and structures include but are not limited to buildings and paved roads. However, areas below ground under these structures and vegetation are considered to be critical habitat since subterranean spaces containing these species and/or transmitting moisture and nutrients through the karst ecosystem extend, in some cases, underneath these existing human-constructed structures and landscaped areas.

Critical Habitat Proposal

Lands proposed as critical habitat for the nine karst invertebrates occur in 25 separate units with a total area of approximately 3,857 ha (9,516 ac). The lands within the proposed units are under private, city, State, and Federal ownership. Table 2 below lists the known occupied caves, the karst fauna region, the total area, land ownership, and the listed species that occur within each proposed unit.

TABLE 2.—KNOWN OCCUPIED CAVES, THE KARST FAUNA REGION (KFR), TOTAL AREA (HECTARES (HA), ACRES (AC)), LAND OWNERSHIP AND LISTED SPECIES THAT OCCUR WITHIN EACH PROPOSED CRITICAL HABITAT UNIT

Unit and known caves in unit	KFR	Total area of unit	Ownership	Listed species in unit
1a. Bone Pile Cave Surprise Sink	Government Canyon	76 ha, 188 ac	State	*N. microps.* *R. infernalis.*
1b. Government Canyon Bat Cave	Government Canyon	47 ha, 116 ac	State	*C. vespera.* *N. microps.* *R. exilis.* *R. infernalis.*
1c. Lost Pothole	Government Canyon	47 ha, 116 ac	State	*C. madla.*
1d. Lithic Ridge Cave	Government Canyon	47 ha, 116 ac	State	*R. infernalis.*
1e. Canyon Ranch Pit* Fat Man's Nightmare Cave* Pig Cave San Antonio Ranch Pit Scenic Overlook Cave* Tight Cave	Government Canyon	341 ha, 842 ac	Private, State	*R. infernalis.* *R. exilis.* *B. venyivi.*
2. Logan's Cave Madla's Drop Cave	Helotes	99 ha, 245 ac	Private	*C. madla.* *R.infernalis.* *R. exilis.*
3. Helotes Blowhole* Helotes Hilltop*	Helotes	63 ha, 154 ac	Private	*B. venyivi.* *C. madla.* *R. infernalis.* *R. exilis.*
4. Kamikazi Cricket Cave	UTSA	63 ha, 154 ac	Private	*R. infernalis.* *R. exilis.*
5. Christmas Cave	Helotes	47 ha, 116 ac	Private	*B. venyivi.* *C. madla.* *R. infernalis.* *R. exilis.*
6. John Wagner Ranch Cave No. 3*	UTSA	45 ha, 111 ac	Private	*R. infernalis.* *R. exilis.*
7. Young Cave No. 1	UTSA	50 ha, 123 ac	Private	*R. exilis.*
8. Hills and Dales Pit* Robber's Cave Three Fingers Cave	UTSA	174 ha, 428 ac	Private	*C. madla.* *R. infernalis.* *R. exilis.*
9. Mastodon Pit	UTSA	71 ha, 175 ac	State, Private	*R. exilis.*
10. Flying Buzzworm Cave Headquarters Cave Low Priority Cave	Stone Oak	367 ha, 906 ac	Federal, City, Private	*C. madla.* *R. infernalis.* *R. exilis.*

TABLE 2.—KNOWN OCCUPIED CAVES, THE KARST FAUNA REGION (KFR), TOTAL AREA (HECTARES (HA), ACRES (AC)), LAND OWNERSHIP AND LISTED SPECIES THAT OCCUR WITHIN EACH PROPOSED CRITICAL HABITAT UNIT—Continued

Unit and known caves in unit	KFR	Total area of unit	Ownership	Listed species in unit
11. 40 mm Cave B–52 Cave Backhole Boneyard Pit Bunny Hole Cross the Creek Cave Dos Viboras Cave Eagle's Nest Cave Hilger Hole Hold-Me-Back Cave Isocow Cave MARS Pit MARS Shaft Pain in the Glass Cave Platypus Pit Poor Boy Baculum Cave Root Canal Cave Root Toupee Cave Strange Little Cave Up the Creek Cave	Stone Oak	1,273 ha, 3,143 ac	Federal	*R. exilis.*
12. Hairy Tooth Cave Ragin' Cajun Cave	Stone Oak	105 ha, 258 ac	Private	*R. exilis.*
13. Black Cat Cave	Stone Oak	51 ha, 125 ac	Private	*R. exilis.*
14. Game Pasture Cave No. 1 King Toad Cave Stevens Ranch Trash	Culebra Anticline	173 ha, 426 ac	Private	*R. infernalis.*
15. Braken Bat Cave Isopit Obvious Little Cave Wurzbach Bat Cave	Culebra Anticline	195 ha, 481 ac	Private	*C. venii.* *R. infernalis.*
16. Caracol Creek Coon Cave	Culebra Anticline	61 ha, 152 ac	Private	*R. infernalis.*
17. Madla's Cave*	Helotes	48 ha, 118 ac	Private	*C. madla.* *R. infernalis.*
18. Mattke Cave Scorpion Cave	UTSA	40 ha, 100 ac	Private	*R. nfernalis.*
19. Genesis Cave	Stone Oak	59 ha, 146 ac	Private	*R. infernalis.*
20. Robber Baron Cave	Alamo Heights	160 ha, 395 ac	Private	*C. baronia.* *T. cokendolpheri.*
21. Hornet's Last Laugh Pit Kick Start Cave Springtail Crevice	Stone Oak	155 ha, 382 ac	Private	*R. exilis.*
Totals: 25 57		3,857 ha, 9,516 ac.		

*Indicates caves and their associated preserve lands that have special management under La Cantera's Section 10 permit and have therefore not been included in the proposed critical habitat designation. These caves and their associated preserve lands were not included in the totals in this table.

The lands within the proposed critical habitat units, with the exception of Units 19 and 20, provide the full range of primary constituent elements needed by the nine karst invertebrates including (1) the physical features of karst-forming rock containing subterranean spaces with stable temperatures, high humidities (near saturation) and suitable substrates (for example, spaces between and underneath rocks suitable for foraging and sheltering), and (2) the biological features of a healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) surrounding the karst feature that provide nutrient input and buffers the karst ecosystem from adverse effects (from, for example, non-native species invasions, contaminants, and fluctuations in temperature and humidity). Lands within Units 19 and 20 are heavily urbanized and intensive management may be required to provide nutrients and water to the listed species within these units. See ''Proposed Critical Habitat Unit Descriptions'' below for detailed descriptions of all units.

Twelve caves known to contain one or more of the listed species were not included in the proposed critical habitat designation. The caves referred to as ''unnamed cave ½ mile N of Helotes'' and ''5 miles NE of Helotes'' were not specifically included because their precise locations are unknown.

La Cantera Cave No. 1 and La Cantera Cave No. 2 were also not included in this proposed critical habitat designation. La Cantera received a section 10(a)(1)(B) permit for take of the listed species in La Cantera Cave No. 1 and La Cantera Cave No. 2. After evaluating the HCP and associated information, we determined that a sufficient number of caves containing these species remained so that take of the species within these two caves would not preclude recovery of the species. Therefore, La Cantera Cave No. 1 and La Cantera Cave No. 2 were not included in this designation because

they are not considered essential to the conservation of the species. The decision to issue the permit was also based on La Cantera's proposal to mitigate for take of the species within these caves by purchasing and managing eight caves known to contain one or more of the listed species for which take was being permitted and their associated preserve lands. These mitigation caves are Canyon Ranch Pit, Fat Man's Nightmare Cave, and Scenic Overlook Cave and the surrounding approximately 30 ha (75 ac) (within Unit 1e); Helotes Blowhole and Helotes Hilltop caves and the surrounding approximately 10 ha (25 ac) (within Unit 3); John Wagner Cave No. 3 and the surrounding approximately 1.6 ha (4 ac) (within Unit 6); Hills and Dales Pit and the surrounding approximately 28 ha (70 ac) (within Unit 8); and Madla's Cave and the surrounding approximately 2 ha (5 ac) (within Unit 17). La Cantera recently completed their purchase of these karst preserves through conservation easement and/or fee simple title and has agreed to protect and manage them in perpetuity in accordance with the conservation needs of the species. Since these areas do not require additional special management beyond that provided for through the HCP and do not meet the definition of critical habitat, these caves and their associated preserve lands were also excluded from this proposed critical habitat designation.

Proposed Critical Habitat Unit Descriptions

Units 1a, 1b, 1c, 1d

Units 1a, 1b, 1c, and 1d are located on Government Canyon State Natural Area (GCSNA), an approximately 2,688-ha (6,643-ac) area owned and managed by the Texas Parks and Wildlife Department (TPWD). GCSNA was purchased in 1993 and is not currently accessible to the public. The projected opening is late 2003 or early 2004. Lands within the four proposed units are undeveloped, with several one-lane, unpaved roads which will serve primarily as pedestrian trails once the facility opens. Unauthorized public vehicular traffic will not be allowed (George Kegley, TPWD, pers. comm. 2002). An unpaved road/trail crosses Units 1a, 1b, and 1c. Unit 1a contains two known occupied caves and Units 1b, 1c, and 1d each contain one cave known to contain listed species (Table 2).

These units were delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied caves, overlying a contiguous deposit of karst-bearing rock. The majority of GCSNA, including the proposed units, are defined by Veni's 1994 karst zone maps as occurring within Zone 2. Since lands within this unit are primarily undeveloped and the property is under one ownership, we were unable to delineate the boundaries of the units using roads or parcel boundaries, and instead delineated the units as squares encompassing approximately 36-ha circular areas containing the endangered species cave habitat.

Unit 1e

The majority of Unit 1e consists of large tracts of privately owned land that is primarily undeveloped with the exception of several small private and/or county roads. A small corner of GCSNA also occurs in this unit. No highways or major roadways occur within the unit. This unit contains six caves known to contain listed species (Table 2). Three of the caves are located on an approximately 162–ha (400–ac) privately-owned, undeveloped, property bordered by GCSNA to the west and south, La Cantera's 30–ha (75–ac) Canyon Ranch preserve to the north, and by the City of San Antonio's Iron Horse Canyon property on the east. The 162–ha (400–ac) property also contains four caves that may contain suitable habitat for one or more of the listed species, but require additional surveys during suitable environmental conditions (Kemble White, SWCA, pers.comm. 2002). Three of these caves are within the 36–ha (90–ac) habitat area of a known occupied cave on the property.

Three of the six known occupied caves within this unit and their associated preserve lands have been excluded from this critical habitat designation. The 30–ha (75–ac) Canyon Ranch Preserve contains Canyon Ranch Pit, Fat Man's Nightmare Cave, and Scenic Overlook Cave and has been acquired by La Cantera under their Section 10(a)(1)(B) permit, which also requires that these caves and the surrounding preserve lands be managed in perpetuity for the conservation of the species. Since these lands do not require special additional management, they have been excluded from critical habitat designation.

The City of San Antonio's Iron Horse Canyon property is approximately 241 ha (595 ac). Two caves containing listed species occur on the property (Kemble White, SWCA, pers. comm. 2002). However, the surveys were conducted in these caves prior to the species' listing and to date, we have not been able to obtain a copy of the survey report with cave names and precise locations.

This unit was delineated to encompass at least 36 ha of vegetation around each of the six known occupied caves overlying contiguous deposits of karst-bearing rock. Unit 1e is defined by Veni's 1994 karst zone maps as occurring within Zone 2. This unit was enlarged to include the City of San Antonio's Iron Horse Canyon property, which contains two known occupied caves. Since we are unsure about the location of these caves, the entire property was included within the critical habitat designation. This unit may be modified depending on additional location information about these two caves obtained during the public comment period for this proposed rule. The unit was also enlarged to include one of the four caves on the 162-ha (400-ac) property, which is believed to contain suitable habitat for one or more of the listed species, and a 36–ha habitat area around the cave. This unit may be modified depending on the results of additional species surveys that may be conducted in this cave during the public comment period for this proposed rule. The unit boundaries were delineated following roads and parcel boundaries.

Unit 2

Unit 2 consists of large, wooded tracts which appear to be undeveloped with the exception of several buildings. The unit contains two or three small private or county roads, but no highways or major roadways. Two caves known to contain listed species occur within Unit 2 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the two known occupied caves overlying a contiguous deposit of karst-bearing rock. Unit 2 is defined by Veni's 1994 karst zone maps as occurring within Zone 2. The unit was enlarged to encompass undisturbed, unfragmented woodland to compensate for internal fragmentation due to several small roads, buildings and an area from which the majority of the woodland has been removed. The unit boundaries were delineated primarily along existing roads and parcel boundaries.

Unit 3

Unit 3 consists of relatively large, wooded tracts. The tracts along the northern side of the unit have been developed with homes, but it appears that the remainder of the properties within the unit are undeveloped. The unit contains several small residential roads, but no major roadways or

highways. The unit is bordered by Bandera Road, a four-lane divided roadway, and by two-lane residential roads. The unit contains two known occupied caves (Table 2) which, along with their associated preserve lands, have been excluded from this critical habitat designation. Helotes Blowhole and Helotes Hilltop Cave and the approximately 10 ha (25 ac) surrounding the caves has been acquired by La Cantera under their Section 10(a)(1)(B) permit which requires that these caves and the surrounding preserve lands be managed in perpetuity for the conservation of the species. Since these lands do not require additional special management, they have been excluded from critical habitat designation.

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the two known occupied caves overlying contiguous deposits of karst-bearing rock. The majority of Unit 3 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the two known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland areas to compensate for internal fragmentation due to several small roads, buildings and an area from which the majority of the woodland has been removed. The unit boundaries were delineated along existing roads.

Unit 4

Unit 4 consists of relatively large wooded tracts subdivided for residential development, of which few appear to be developed. The unit contains several residential roads, but no major roadways or highways. Lands surrounding Unit 4 consist of relatively large subdivided residential tracts that appear to be largely undeveloped. One cave known to contain listed species occurs within Unit 4 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. The majority of Unit 4 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave while maximizing the amount of undisturbed, unfragmented vegetation in the unit. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to several residential roads and residential development that occur within the unit. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a square encompassing an approximately 36–ha circular area containing the endangered species cave habitat.

Unit 5

Unit 5 consists of a large tract of undeveloped, woodland and several smaller, wooded tracts developed with homes and an associated residential road. The unit is bordered to the north and northwest by large tracts of undeveloped woodland and bordered on the remaining sides by smaller tracts with some residential development. One cave known to contain listed species occurs within Unit 5 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. The majority of Unit 5 is defined by Veni's 1994 karst zone maps as occurring within Zones 1 and 2. The unit was delineated to encompass the majority of the contiguous Zone 1 and 2 karst deposits associated with the known occupied cave while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a square encompassing an approximately 36-ha circular area containing the endangered species cave habitat.

Unit 6

Unit 6 consists primarily of relatively large tracts of undeveloped woodland with several smaller tracts developed with homes. The unit is bordered to the east by large, wooded, undeveloped tracts and to the west by a residential development. The unit contains one known occupied cave (Table 2) which along with its associated preserve lands have been excluded from this critical habitat designation. John Wagner Ranch Cave No. 3 and the approximately 1.6 ha (4 ac) surrounding the cave has been acquired by La Cantera under their Section 10(a)(1)(B) permit which requires that the cave and the surrounding preserve lands be managed in perpetuity for the conservation of the species. Since these lands do not require additional special management, they have been excluded from critical habitat designation.

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. The majority of Unit 6 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a square encompassing an approximately 36-ha circular area containing the endangered species cave.

Unit 7

Unit 7 consists of relatively large, wooded tracts, several of which have been developed with homes. The unit contains several residential roads, but no highways or major roadways. One cave known to contain listed species occurs within Unit 7 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. The majority of Unit 7 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave while also maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a square encompassing an approximately 36-ha circular area containing the endangered species cave.

Unit 8

The majority of the lands within Unit 8 consist of large tracts of primarily undeveloped woodland. The southeastern portion of the unit has been subdivided and developed with homes. Part of this area has been developed with residential roads, but currently contains no homes. The unit contains three known occupied caves (Table 2). One of the caves along with its associated preserve lands, have been excluded from this critical habitat designation. Hills and Dales Pit and approximately 28 ha (70 ac) surrounding the cave have been acquired by La Cantera under their Section 10(a)(1)(B) permit which requires that the cave and the

surrounding preserve lands be managed in perpetuity for the conservation of the species. Since these lands do not require additional special management, they have been excluded from critical habitat designation.

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the three known occupied caves, overlying contiguous deposits of karst-bearing rock. The majority of Unit 8 is defined by Veni's 1994 karst zone maps as occurring within Zones 1 and 2. The unit was delineated to encompass the majority of the contiguous Zone 1 and 2 karst deposits associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to several small roads and residential development within the unit. The unit boundaries were primarily delineated along existing roads and parcel boundaries.

Unit 9

Unit 9 consists of a large tract of undeveloped, woodland. The unit is bordered to the north by Loop 1604, a major highway, and to the south by a two-lane roadway. The unit is bordered to the west by the University of Texas at San Antonio campus and to the east by some commercial development. This unit contains one cave known to contain listed species (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. Roughly half of Unit 9 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit boundaries were delineated along existing roads and a named creek.

Unit 10

Unit 10 consists of several large tracts of woodland. Most of Unit 10 is undeveloped. Roughly half of this unit consists of lands owned and operated by the Department of Defense's (DOD) Camp Bullis. The majority of the DOD-owned area within this unit is not extensively developed with structures or major roadways, but does contain areas used for some types of military training maneuvers. The other half of the unit consists of Eisenhower Park, owned by the City of San Antonio, and a privately-owned tract that is currently undeveloped. Three caves known to contain listed species occur within Unit 10 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the three known occupied caves, overlying contiguous deposits of karst-bearing rock. The majority of Unit 10 is defined by Veni's 1994 karst zone maps as occurring within Zones 1 and 2. The unit was delineated to encompass the majority of the contiguous Zone 1 and 2 karst deposits associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented vegetation within the unit. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to several roads and buildings, as well as potential impacts due to military training maneuvers. The unit boundaries were delineated along existing roads and parcel boundaries.

Unit 11

Unit 11 consists of the southeastern portion of the DOD's Camp Bullis. The area is not extensively developed with structures or major roadways, but does contain areas used for some types of military training maneuvers and contains large areas where the woodland vegetation was cleared at some point in the past. Less than half of the known occupied caves are located within woodland areas. Lands to the east and south of the unit are undergoing rapid suburban development. This unit contains 20 caves containing listed species (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the 20 known occupied caves, overlying contiguous deposits of karst-bearing rock. The majority of Unit 11 is defined by Veni's 1994 karst zone maps as occurring within Zone 2. The unit was delineated to encompass the majority of the contiguous Zone 2 karst deposit associated with the known occupied caves while maximizing the amount of undisturbed and unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to several roads and developed areas, and potential impacts associated with military training maneuvers. The unit boundaries were delineated primarily along existing roads and parcel boundaries.

Unit 12

The majority of Unit 12 consists of lands that have been subdivided for residential development. Single-family homes have been constructed on roughly half of the subdivided lots. Several residential roads and one major roadway occur within the unit. 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. Several relatively large tracts of undeveloped land occur within and to the north of the unit. Two caves known to contain listed species occur within Unit 12 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the two known occupied caves, overlying contiguous deposits of karst-bearing rock. The majority of Unit 12 is defined by Veni's 1994 karst zone maps as occurring within Zone 2. The unit was delineated to encompass the majority of the contiguous Zone 2 karst deposit associated with the known occupied caves while maximizing the amount of undisturbed and unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to existing residential development within the unit. The unit boundaries were primarily delineated along existing roads and a named creek.

Unit 13

Unit 13 consists primarily of large, currently undeveloped wooded tracts with several smaller tracts developed with homes. Bulverde Road, a major roadway, bisects the western portion of the unit. The unit is bordered by dense residential development on the northwest and significantly less dense residential development on the northeast. The lands to the south, southeast, and southwest consist of large, undeveloped, wooded, tracts. One cave containing listed species occurs within this unit (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. The majority of Unit 13 is defined by Veni's 1994 karst zone maps as occurring within Zones 1 and 2. The unit was delineated to encompass the majority of the contiguous Zone 1 and 2 karst deposits associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal

fragmentation due to existing residential development and the presence of a major roadway within the unit. The unit boundaries were primarily delineated along parcel boundaries and existing roads.

Unit 14

Unit 14 consists of several large tracts of undeveloped woodland with no major roadways or highways. Three caves known to contain listed species occur within Unit 14 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the three known occupied caves, overlying contiguous deposits of karst-bearing rock. Unit 14 is defined by Veni's 1994 karst zone maps as occurring within Zones 1 and 2. The unit was delineated to encompass the majority of the contiguous Zone 1 and 2 karst deposits associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a rectangle encompassing an approximately 36-ha area around each of the three known occupied caves.

Unit 15

The majority of the lands within Unit 15 are within a subdivision. Tracts in the subdivision are relatively large and still contain wooded vegetation. Two large, wooded, undeveloped tracts are located east of the subdivision. The unit contains several residential roads, but no major roadways or highways. Unit 15 contains four caves known to contain listed species (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around each of the four known occupied caves, overlying contiguous deposits of karst-bearing rock. The majority of Unit 15 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to existing residential development within the unit. The unit boundaries were delineated along parcel boundaries and existing roads.

Unit 16

Unit 16 contains several large, primarily undeveloped tracts of woodland. However, Loop 1604, a major highway, bisects the eastern half of the unit. One cave known to contain endangered species occurs within Unit 16 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. Unit 16 is defined by Veni's 1994 karst zone maps as occurring almost entirely within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to Loop 1604. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a rectangle encompassing an approximately 36-ha area around the known occupied cave.

Unit 17

Unit 17 consists of relatively large tracts of undeveloped woodland with only a few small private or county roads. Lands adjacent to the unit are also undeveloped and wooded. The unit contains one known occupied cave (Table 2) which, along with its associated preserve lands, has been excluded from this critical habitat designation. Madla's Cave and approximately 2 ha (5 ac) surrounding the cave have been acquired by La Cantera under their Section 10(a)(1)(B) permit which requires that the cave and the surrounding preserve lands be managed in perpetuity for the conservation of the listed species. Since these lands do not require additional special management, they have been excluded from critical habitat designation.

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the known occupied cave, overlying a contiguous deposit of karst-bearing rock. Roughly half of Unit 17 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit boundaries were delineated along parcel boundaries.

Unit 18

The northern portion of Unit 18 consists of relatively large, wooded tracts subdivided for residential development, the majority of which appear to be undeveloped. The southern portion of the unit is lined with developed residential lots. Unit 18 is bisected by one residential road. Adjacent lands to the west consist of relatively large residential tracts that appear to be currently undeveloped. The remaining sides are bordered by developed residential and commercial properties. Two caves known to contain listed species occur within Unit 18 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the two known occupied caves, overlying contiguous deposits of karst-bearing rock. About half of Unit 18 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland in the unit. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to existing residential development within the unit. The unit boundaries were delineated along parcel boundaries and existing roads.

Unit 19

The majority of the land within Unit 19 has been developed for residential and/or commercial uses. Unit 19 is bordered to the east by Stone Oak Road, a major roadway, and to the south by Loop 1604, also a major roadway. However, several undeveloped areas exist on lands adjacent to the unit to the northwest. Genesis Cave, the only known occupied cave within this unit (Table 1), is the deepest explored cave in Bexar County, extending below the water table, and has been mapped down to 78 m (256 ft) (Veni 1988).

The majority of Unit 19 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the majority of the contiguous Zone 1 karst deposit associated with the known occupied cave. The unit boundaries were delineated along parcel boundaries and existing roads.

Surface vegetation within Unit 19 has been significantly reduced and degraded as a result of urban development, and intensive management may be needed to

provide nutrients and water to the listed species in this cave. Lands within this unit do not contain the primary constituent element of a healthy surface community of native vegetation. Therefore, this unit is being designated as critical habitat based on the presence of an intact subsurface environment.

Unit 20

Numerous residential roads and one major roadway, Nacogdoches Road, occur within and/or cross Unit 20. This unit contains one known occupied cave, Robber Baron Cave (Table 2). This cave is by far the longest cave in Bexar County consisting of approximately 1.51 km (0.94 mi) of passages known within a square area approximately 100 m (328 ft) on each side (Veni 1988). Prior to the extensive development that has occurred in the area, the cave's footprint was estimated to extend at least 100 m (328 ft) farther east to a water well, 600 m (1,969 ft) southwest to a now-sealed, extensive maze cave and about 1.2 km (0.75 mi) to the southwest to another well (Veni 1988). The estimated footprint of the cave now extends underneath numerous residential and commercial developments. Intensive management may be needed to provide nutrients and water to the two listed species found in this cave which are only known from Robber Baron Cave, making it essential to the conservation of these species. The Texas Cave Management Association (TCMA) now owns and manages the cave and about 0.2 ha (0.5 ac) surrounding the opening. TCMA, in cooperation with the Service's Partners for Fish and Wildlife Program, is currently working to replace the existing cave gate, which consists of a concrete bunker created to deter access, with a new gate that will facilitate exchange of air and nutrients into the cave as well as restrict access. TCMA also plans to restore the grounds immediately surrounding Robber Baron Cave to a more natural state and repair the perimeter fence to regulate access.

The majority of Unit 20 is defined by Veni's 1994 karst zone maps as occurring within Zone 1. The unit was delineated to encompass the estimated extent of the cave's subsurface drainage according to Veni (1997) and a majority of the contiguous Zone 1 karst deposit associated with Robber Baron Cave. The unit boundaries were delineated along parcel boundaries and existing roads.

Surface vegetation within Unit 20 has been significantly reduced and degraded as a result of urban development. Lands within this unit do not contain the primary constituent element of a healthy surface community of native vegetation. Therefore, this unit is being designated as critical habitat based on the presence of an intact subsurface environment.

Unit 21

Unit 21 consists of several large tracts of undeveloped land and several smaller tracts developed with homes and several residential roads. Mud Creek runs through the unit. Three caves known to contain listed species occur with Unit 21 (Table 2).

This unit was delineated to encompass at least 36 ha (90 ac) of vegetation around the three known occupied caves, overlying contiguous deposits of karst-bearing rock. Unit 21 is defined by Veni's 1994 karst zone maps as occurring within Zone 2. The unit was delineated to encompass the majority of the contiguous karst deposit associated with the known occupied caves while maximizing the amount of undisturbed, unfragmented woodland surrounding the cave. The unit was enlarged to include additional woodland to compensate for internal fragmentation due to existing residential development within the unit. We were unable to delineate the boundaries of the unit using roads or parcel boundaries due to their configuration and instead delineated the unit as a rectangle encompassing an approximately 36-ha area around each of the three known occupied caves.

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 do not destroy or adversely modify critical habitat. Destruction or adverse modification occurs when a Federal action directly or indirectly alters critical habitat to the extent that it appreciably diminishes the value of the critical habitat for both the survival and recovery of the species. Individuals, organizations, States, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding.

Section 7(a)(2) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Activities on Federal lands that may affect the listed karst invertebrates or their proposed critical habitat will require section 7 consultation with the Service. Actions on private or State lands receiving funding or requiring a permit from a Federal agency also will be subject to the section 7 consultation process if the action may affect proposed critical habitat. Federal actions not affecting the species or its proposed critical habitat, as well as actions on non-Federal lands that are not federally funded or permitted will not require section 7 consultation. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402.

Section 7(a)(4) of the Act requires Federal agencies to confer on any action likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. Conference reports provide conservation recommendations to assist the agency in eliminating conflicts that may be caused by the proposed action. The conservation recommendations are advisory. We may issue a formal conference report, if requested by the Federal action agency. Formal conference reports include an opinion that is prepared according to 50 CFR 402.14, as if the species was listed or critical habitat was designated. We may adopt the formal conference report as the biological opinion when the species is listed or critical habitat is designated, if no substantial new information or changes in the action alter the content of the opinion (see 50 CFR 402.10(d)).

If a species is listed or critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that actions they authorize, fund, or carry out are unlikely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Through this consultation, the Federal agency would ensure that the permitted actions do not destroy or adversely modify critical habitat.

If we issue a biological opinion, resulting from a section 7 consultation, concluding that a Federal action is likely to result in the destruction or adverse modification of critical habitat, we would also provide reasonable and prudent alternatives to the action, if any are identifiable. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the

Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Service's Director believes would avoid destruction or adverse modification of critical habitat.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where critical habitat is subsequently designated and the Federal agency has retained discretionary involvement or control over the action or such discretionary involvement or control is authorized by law. Consequently, some Federal agencies may request reinitiation of consultation with us on actions for which formal consultation has been completed if those actions may affect designated critical habitat.

Activities on Federal lands that may adversely affect any of the nine karst invertebrates or their critical habitat will require section 7 consultation. Activities on private or State lands requiring a permit from a Federal agency, such as a permit from the U.S. Army Corps of Engineers (ACOE) under section 404 of the Clean Water Act or a Construction General permit from the U.S. Environmental Protection Agency, or some other Federal action, including funding (for example, from the Federal Highway Administration, Federal Aviation Administration, Federal Emergency Management Agency (FEMA), Natural Resources Conservation Service (NRCS), or Housing and Urban Development (HUD)) will also continue to be subject to the section 7 consultation process. Federal actions not adversely affecting listed species or critical habitat and actions on non-Federal lands that are not federally funded or permitted do not require section 7 consultation.

Section 4(b)(8) of the Act requires us to evaluate briefly in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. Activities that may result in the destruction or adverse modification of critical habitat include those that alter the primary constituent elements to an extent that the value of critical habitat for the survival and recovery of any of the nine karst invertebrates is appreciably reduced. Activities that may directly or indirectly adversely affect critical habitat for these karst invertebrates include, but are not limited to:

(1) Removing, thinning, or destroying perennial surface vegetation, with the exception of landscaping associated with existing human-constructed, above ground, impervious structures, occurring in any critical habitat unit, whether by burning, mechanical, chemical, or other means (for example, wood cutting, grading, overgrazing, construction, road building, mining, herbicide application);

(2) Alteration of the surface topography or subsurface geology within any critical habitat unit that results in significant disruption of ecosystem processes that sustain the cave environment. This may include, but is not limited to, such activities as filling cave entrances or otherwise reducing airflow, which limits oxygen availability; modifying cave entrances, or creating new entrances that increases airflow and results in drying; altering natural drainage patterns (surface or subsurface) that alters the amount of water entering the cave or karst feature; removal or disturbance of native surface vegetation; soil disturbance that results in increased sedimentation in the karst environment; increasing impervious cover within any critical habitat unit; and altering the entrance or opening of the cave or karst feature in a way that would disrupt movements of raccoons, opossums, cave crickets, or other animals that provide nutrient input; or otherwise negatively altering the movement of nutrients into the cave or karst feature;

(3) Discharge or dumping of chemicals, silt, pollutants, household or industrial waste, or other harmful material into or near critical habitat units that may affect surface plant and animal communities that support karst ecosystems;

(4) Pesticide or fertilizer application in or near critical habitat units that drain into these karst features or that affect surface plant and animal communities that support karst ecosystems. Careful use of pesticides in the vicinity of karst features may be necessary in some instances to control nonnative fire ants. Guidelines for controlling fire ants in the vicinity of karst features are available from us (see **ADDRESSES** section);

(5) Activities within caves that lead to soil compaction, changes in atmospheric conditions, abandonment of the cave by bats or other fauna; and

(6) Activities that attract or increase access for fire ants, cockroaches, or other invasive predators, competitors or potential vectors for diseases or parasites into caves or karst features within the critical habitat units (for example, dumping of garbage in or around caves or karst features).

Not all of the identified activities will necessarily result in the adverse modification of critical habitat, however, they indicate the potential types of activities that will require section 7 consultation in the future and, therefore, that may be affected by the proposed designation of critical habitat. To properly portray the effects of critical habitat designation, we must compare the section 7 requirements for actions that may affect critical habitat with the requirements for actions that may affect a listed species. All of the areas proposed as critical habitat units are known to contain one or more caves occupied by one or more of the listed karst invertebrates. Therefore, all of the actions described above as potentially adversely affecting critical habitat are also likely to adversely affect the listed species. Federal agencies are already required to consult with us on activities in areas where the species may be affected to ensure that their actions do not jeopardize the continued existence of the species. Therefore, we do not expect that the proposed designation of critical habitat will result in a significant regulatory burden above that already in place due to the presence of the listed species.

If you have questions regarding whether specific activities would constitute adverse modification of critical habitat, please contact the Acting Field Supervisor, Austin Ecological Services Field Office (see the **FOR FURTHER INFORMATION CONTACT** section). Requests for copies of the regulations on listed wildlife and plants, and inquiries about prohibitions and permits, should be directed to the U.S. Fish and Wildlife Service, Endangered Species Act Section 10 Program (see **ADDRESSES** section).

Exclusions Under Section 3(5)(A) Definition

Critical habitat is defined in section 3, paragraph (5)(A) of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and, (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Special management and protection are not required if adequate management and protection are already in place. Adequate special management or protection is provided by a legally operative plan/agreement that addresses the maintenance and improvement of the primary constituent elements

important to the species and manages for the long-term conservation of the species. If any areas containing the primary constituent elements are currently being managed to address the conservation needs of any of the nine karst invertebrate species and do not require additional management or protection, we may exclude such areas from the proposed rule because they would not meet the definition of critical habitat in section 3(5)(A)(i) of the Act.

We will use the following three guidelines to determine if a plan provides adequate management or protection—(1) A current plan specifying the management actions must be complete and provide sufficient conservation benefit to the species; (2) the plan must provide assurances that the conservation management strategies will be implemented; and (3) the plan must provide assurances that the conservation management strategies will be effective.

In determining if management strategies are likely to be implemented, we will consider whether: (1) A management plan or agreement exists that specifies the management actions being implemented or to be implemented; (2) there is a timely schedule for implementation; (3) there is a high probability that the funding source(s) or other resources necessary to implement the actions will be available; and (4) the party(ies) have the authority and long-term commitment to the agreement or plan to implement the management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands.

In determining whether an action is likely to be effective, we will consider whether: (1) The plan specifically addresses the management needs, including reduction of threats to the species; (2) such actions have been successful in the past; (3) there are provisions for monitoring and assessment of the effectiveness of the management actions; and (4) adaptive management principles have been incorporated into the plan.

Adequate reduction of the threat from non-native invasive species (for example, non-native fire ants), that are already present, adjacent to, and/or within some caves may, to some extent, require different management activities. Although difficult for managers to control at this time, control of non-native fire ant populations is one requirement in determining whether an area is being adequately managed such that it does not meet the definition of critical habitat.

In selecting areas to be designated as critical habitat, we attempted to exclude areas that have a plan that addresses the conservation needs of any of the nine karst invertebrate species and that meets the guidelines described above. We determined that the five karst preserves established by La Cantera as required by their section 10(a)(1)(B) permit should be excluded based on the guidelines given above. These karst preserves include Canyon Ranch preserve (including Canyon Ranch Pit, Fat Man's Nightmare Cave, and Scenic Overlook Cave and the surrounding approximately 30 ha (75 ac) (within Unit 1e); Helotes Blowhole and Helotes Hilltop caves and the surrounding approximately 10 ha (25 ac) (within Unit 3); John Wagner Cave No. 3 and the surrounding approximately 1.6 ha (4 ac) (within Unit 6); Hills and Dales Pit and the surrounding approximately 28 ha (70 ac) (within Unit 8); and Madla's Cave and the surrounding approximately 2 ha (5 ac) (within Unit 17). As required under their permit, La Cantera purchased these lands through conservation easement and/or fee simple title and will ensure that they will be protected in perpetuity and managed in accordance with the conservation needs of the species.

We did not exclude areas that do not have a plan that provides adequate management or protection as described under the guidelines above. Camp Bullis submitted a draft management plan to the Service for the 23 caves on DOD property that are known to contain listed species. These 23 caves are included within 2 proposed critical habitat units (Units 10 and 11). The Service is currently working with Camp Bullis to determine management needed to adequately protect the species and its habitat. Therefore, caves on Camp Bullis were not excluded from the proposed critical habitat designation. It is our understanding that the proposed management plan is currently being revised.

If a management plan for Camp Bullis or other areas proposed as critical habitat (for example, Government Canyon State Natural Area), that addresses the above requirements, can be completed and approved by us prior to the end of the public comment period for this proposed rule, these areas will not be included in the final critical habitat designation.

We are unaware of any other lands within the proposed critical habitat units that have a written plan for the conservation of these species that could have been evaluated for exclusion under section 3(5)(A) of the Act.

Exclusions Under Section 4(b)(2)

Section 4(b)(2) of the Act requires that we designate critical habitat on the basis of the best scientific and commercial information available, and that we consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat designation if the benefits of exclusion outweigh the benefits of designation, provided the exclusion will not result in the extinction of the species. We will conduct an economic analysis for this proposal prior to making a final determination. When completed, we will announce the availability of the draft economic analysis with a notice in the **Federal Register**, and we will provide at least a 30-day public comment period on the draft economic analysis which may fall during or after the 90-day comment period for this proposed rule.

Public Comments Solicited

We intend that any final action resulting from this proposal be as accurate and as effective as possible. Therefore, we solicit comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We are particularly interested in comments concerning:

(1) The reasons why any area should or should not be determined to be critical habitat as provided by section 4 of the Act, including whether the benefits of designation will outweigh any threats to the species due to designation;

(2) Specific information on the distribution of each of the nine karst invertebrates, and what areas are essential to the conservation of these species and why;

(3) Whether lands within proposed critical habitat units are currently being managed to address the conservation needs of these listed species

(4) Land use practices and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(5) Any foreseeable economic or other impacts resulting from the proposed designation of critical habitat, in particular, any impacts on small entities or families;

(6) Economic and other values associated with designating critical habitat for the nine karst invertebrates, such as those derived from non-consumptive uses (such as, hiking, sight-seeing, enhanced watershed protection, improved air quality,

increased soil retention, ''existence values,'' and reductions in administrative costs).

If you wish to comment, you may submit your comments and materials concerning this proposal by any one of several methods (see **ADDRESSES** section).

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Respondents may request that we withhold their home address, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this request prominently at the beginning of your comment. However, we will not consider anonymous comments. To the extent consistent with applicable law, we will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the Austin Ecological Services Field Office, Austin, Texas (see **ADDRESSES** section).

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent individuals regarding this proposed rule. The purpose of such review is to ensure critical habitat decisions are based on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to peer reviewers immediately following publication in the **Federal Register**. We will invite peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed designation of critical habitat.

We will consider all comments and data received during the 90-day comment period on this proposed rule during preparation of final rulemaking. Accordingly, the final decision may differ from this proposal.

Clarity of the Rule

Executive Order 12866 requires each agency to write regulations and notices that are easy to understand. We invite your comments on how to make this proposed rule easier to understand, including answers to questions such as the following: (1) Are the requirements in the proposed rule clearly stated? (2) Does the proposed rule contain technical language or jargon that interferes with the clarity? (3) Does the format of the proposed rule (grouping and order of sections, use of headings, paragraphing, etc.) aid or reduce its clarity? (4) Is the description of the proposed rule in the **SUPPLEMENTARY INFORMATION** section of the preamble helpful in understanding the document? (5) Is the background information useful and is the amount appropriate? (6) What else could we do to make the proposed rule easier to understand?

Send a copy of any comments that concern how we could make this notice easier to understand to: Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street, NW., Washington, DC 20240. You may also e-mail comments to *exsec@ios.doi.gov.*

Required Determinations

Regulatory Planning and Review

Executive Order 12866

In accordance with Executive Order (E.O.) 12866, this document is a significant rule and has been reviewed by the Office of Management and Budget (OMB) in accordance with the four criteria discussed below. We are preparing a draft economic analysis of this proposed action, which will be available for public comment, to determine the economic consequences of designating specific areas as critical habitat. The availability of the draft economic analysis will be announced in the **Federal Register** so that it is available for public review and comment.

(a) While we will prepare an economic analysis to assist us in considering whether areas should be excluded from critical habitat designation pursuant to section 4 of the Act, we do not believe this rule will have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local or tribal communities. Therefore, we do not believe a cost benefit and economic analysis pursuant to E.O. 12866 is required.

Under the Act, critical habitat may not be adversely modified by a Federal agency action; critical habitat does not impose any restrictions on non-Federal persons unless they are conducting activities funded or otherwise sponsored or permitted by a Federal agency. Section 7 of the Act requires Federal agencies to ensure that they do not jeopardize the continued existence of the species.

Accordingly, we do not expect the designation of areas as critical habitat that are within the geographical range occupied by the species to have any incremental impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons that receive Federal authorization or funding. The designation of areas as critical habitat where section 7 consultations would not have occurred but for the critical habitat designation may have impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons who receive Federal authorization or funding that are not attributable to the species listing. We will evaluate any impact through our economic analysis (under section 4 of the Act: see the ''Exclusions Under Section 4(b)(2)'' section of this rule). Non-Federal persons who do not have a Federal sponsorship of their actions are not restricted by the designation of critical habitat.

(b) We do not believe this rule would create inconsistencies with other agencies' actions. As discussed above, Federal agencies have been required to ensure that their actions not jeopardize the continued existence of the nine karst invertebrates since their listing on December 26, 2000. We will evaluate any additional impact through our economic analysis. Because of the potential for impacts on other Federal agencies activities, we will continue to review this proposed action for any inconsistencies with other Federal agencies actions.

(c) We do not believe this rule, if made final, would materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. Federal agencies are currently required to ensure that their activities do not jeopardize the continued existence of a listed species, and, as discussed above, we will evaluate any additional impacts through an economic analysis.

(d) OMB has determined that this rule raises novel legal or policy issues and, as a result, this rule has undergone OMB review.

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

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that

describes the effects of the rule on small entities (such as, 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. SBREFA amended the Regulatory Flexibility Act (RFA) to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA also amended the RFA to require a certification statement. In today's rule, we are certifying that the rule will not have a significant economic impact on a substantial number of small entities. The following discussion explains our rationale.

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

To determine if the rule would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (for example, housing development, grazing, oil and gas production, timber harvesting, etc.). We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. In some circumstances, especially with proposed critical habitat designations of very limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; non-Federal activities may be affected to the extent that there is a Federal nexus associated with the non-Federal activity. An example of this nexus would be if a non-Federal activity required a Federal permit. In areas where the species is present, Federal agencies are already required to consult with us under section 7 of the Act on activities that they fund, permit, or implement that may affect any of the nine karst invertebrates. If this critical habitat designation is finalized, Federal agencies must also consult with us if their activities may affect designated critical habitat. However, we do not believe this will result in any additional regulatory burden on Federal agencies or their applicants where consultation would already be required due to the presence of the listed species, because the duty to avoid adverse modification of critical habitat would not likely trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species.

Even if the duty to avoid adverse modification does not trigger additional regulatory impacts in areas where the species is present, designation of critical habitat could result in an additional economic burden on small entities due to the requirement to conduct a reinitiation of a past section 7 consultation to conduct an adverse modification analysis. Since the species were listed on December 26, 2000, the only formal section 7 consultation has been an intra-Service consultation on the La Cantera HCP. However, we did not include the caves that La Cantera received take coverage for under their section 10 permit in the proposed critical habitat designation, so reinitiation of the intra-Service section 7 consultation as a result of this proposed designation is not necessary.

In areas where the species is not present, designation of critical habitat could trigger additional review of Federal activities under section 7 of the Act. Since the species were listed on December 26, 2000, the only formal section 7 consultation has been an intra-Service consultation on the La Cantera HCP. For the purposes of this review and certification under the RFA, we are assuming that any future consultations in the area proposed as critical habitat will be due to the listing of the species and the critical habitat designation.

One of the proposed critical habitat units (Unit 11) and a portion of another (Unit 10) are located on Federal lands. Units 1a, 1b, 1c and 1d are located on GCSNA which is owned and managed by TPWD and Unit 9 is owned by the University of Texas at San Antonio (Table 2). On State lands, activities with no Federal involvement would not be affected by the critical habitat designation.

Sixteen of the twenty-five units in the proposed designation consist entirely of privately-owned lands and four include some private lands within the unit (Table 2). On private lands, activities that lack Federal involvement would not be affected by the critical habitat designation.

In Texas, previous consultations under section 7 of the Act between us and other Federal agencies most frequently involve the U.S. Department of Transportation (DOT), the ACOE, and the Environmental Protection Agency (EPA).

In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements. First, if we conclude in a biological opinion that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer ''reasonable and prudent alternatives.'' Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or resulting in adverse modification of critical habitat. A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. Secondly, if we find that a proposed action is not likely to jeopardize the continued existence of a listed animal species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to

implement such measures through non-discretionary terms and conditions. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or develop information that could contribute to the recovery of the species.

Based on our experience with section 7 consultations for all listed species, virtually all projects-including those that, in their initial proposed form, would result in jeopardy or adverse modification determinations in section 7 consultations-can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives. These measures, by definition, must be economically feasible and within the scope of authority of the Federal agency involved in the consultation.

In summary, we have considered whether this proposed rule would result in a significant economic impact on a substantial number of small entities and find that it would not. The entire designation involves approximately 3,857 ha (9,516 ac) within 25 units, of which approximately 1,620 ha (4,000 ac) is under federal ownership and approximately 284 ha (700 ac) is under State ownership. The majority of the remaining acreage is under private ownership, but includes City of San Antonio park lands, and City, County and State right of ways, roads, and municipal lands. However, probable future land uses in these areas are 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 this rule—would be limited to a subset of the area proposed. The most likely Federal involvement would be associated with activities involving the DOD, Federal Highways Administration (FHA), DOT, the EPA, ACOE, or the FEMA. This 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 since 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. We are certifying that the proposed designation of critical habitat for the nine endangered Bexar County invertebrate species will not have a significant economic impact on a substantial number of small entities and that this proposed rule does not meet the criteria under SBREFA as a major rule: Therefore an initial regulatory flexibility analysis is not required.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. Although this rule is a significant action under Executive Order 12866, it is not expected to significantly affect energy supplies, distribution, or use since the majority of the lands being proposed as critical habitat occur on privately owned lands that are primarily developed for agricultural and 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.

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

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 August 25, 2000 *et seq*.):

a. This rule, as proposed, will not ''significantly or uniquely'' affect small governments. A Small Government Agency Plan is not required. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. However, as discussed above, these actions are currently subject to equivalent restrictions through the listing protections of the species, and no further restrictions are anticipated to result from critical habitat designation of occupied areas. In our economic analysis, we will evaluate any impact of designating areas where section 7 consultations would not have occurred but for the critical habitat designation.

b. This rule, as proposed, will not produce a Federal mandate on State, local, or tribal governments or the private sector of $100 million or greater in any year; that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments.

Takings

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), we have analyzed the potential takings implications of the proposed listing and designation of critical habitat for these nine karst invertebrates. The takings implications assessment concludes that this proposed rule does not pose significant takings implications. A copy of this assessment is available by contacting the U.S. Fish and Wildlife Service, Austin Ecological Services Field Office (see **ADDRESSES** section).

Federalism

In accordance with Executive Order 13132, the rule does not have significant Federalism effects. A Federalism assessment is not required. As discussed above, the designation of critical habitat in areas currently occupied by the nine endangered karst invertebrates would have little incremental impact on State and local governments and their activities. The designations may have some benefit to these governments in that the areas essential to the conservation of these species are more clearly defined, and the primary constituent elements of the habitat necessary to the survival of the species are identified. While this designation does not alter where and what federally sponsored activities may occur, it may assist these local governments in long-range planning rather than waiting for case-by-case section 7 consultation to occur.

Civil Justice Reform

In accordance with E.O. 12988, the Department of the Interior's Office of the Solicitor has determined that this proposed rule does not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the Order. We propose to designate critical habitat in accordance with the provisions of the Act, and will plan public hearings on the proposed designation during the comment period, if requested. We plan to hold at least one public hearing and the date for this hearing will be published in separate notice. We also plan to hold an informational meeting in Bexar County on September 10, 2002. This meeting will take place from 6 pm to 7:30 pm at the Great Northwest Library, 9050 Wellwood, San Antonio, Texas. We will send letters inviting all interested individuals to attend and will advertise the meeting in the area newspaper. The

rule uses standard property descriptions and identifies the primary constituent elements within the designated areas to assist the public in understanding the habitat needs of the nine endangered karst invertebrates.

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

This rule does not contain any information collection requirements for which OMB approval under the Paperwork Reduction Act is required. Information collections associated with Endangered Species permits are covered by an existing OMB approval, which is assigned control number 1018–0094 and which expires on July 31, 2004. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB Control Number.

National Environmental Policy Act

We have determined that an Environmental Assessment or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act as amended. A notice outlining our reason for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244). This proposed rule does not constitute a major Federal action significantly affecting the quality of the human environment.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, and 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a Government-to-Government basis. The proposed designation of critical habitat for the nine karst invertebrates does not contain any Tribal lands or lands that we have identified as impacting Tribal trust resources.

References Cited

A complete list of all references cited in this proposed rule is available, upon request, from the U.S. Fish and Wildlife Service, Austin Ecological Services Field Office (see **ADDRESSES** section).

Author

This rule was prepared by the U.S. Fish and Wildlife Service, Austin Ecological Services Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

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 Beetle, Helotes mold; Beetle [no common name] (*Rhadine exilis*); and Beetle [no common name] (*Rhadine infernalis*) under ''INSECTS''; remove the entries for Harvestman, Robber Baron Cave; Spider, Government Canyon Cave; Spider, Madla's Cave; Spider [no common name] (Cicurina venii); Spider, Robber Baron Cave; and Spider, vesper cave; and add entrees for Harvestman, Cokendolpher cave; Meshweaver, Braken Bat Cave; Meshweaver, Government Canyon Bat Cave; Meshweaver, Madla Cave; Meshweaver, Robber Baron Cave; and Spider, Government Canyon Bat Cave under ''ARACHNIDS'' to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate[1]	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
* * * *		*		*		*	
INSECTS							
* * * *		*		*		*	
Beetle, Helotes mold	*Batrisodes venyivi*	U.S.A. (TX)	NA	E	706	19.95(i)	NA
* * * *		*		*		*	
Beetle, [no common name]	*Rhadine exilis*	U.S.A. (TX)	NA	E	706	19.95(i)	NA
Beetle, [no common name]	*Rhadine infernalis*	U.S.A. (TX)	NA	E	706	19.95(i)	NA
* * * *		*		*		*	
ARACHNIDS							
* * * *		*		*		*	
Harvestman, Cokendolpher Cave	*Texella cokendolpher*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
Meshweaver, Braken Bat Cave	*Cicurina venii*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
Meshweaver, Government Canyon Bat Cave.	*Cicurina vespera*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
Meshweaver, Madia Cave	*Cicurina madla*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
Meshweaver, Robber Baron Cave	*Cicurina baronia*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
* * * *		*		*		*	
Spider, Government Canyon Bat Cave.	*Neoleptoneta microps*	U.S.A. (TX)	NA	E	706	19.95(g)	NA
* * * *		*		*		*	

[1] Vertebrate population where endangered or threatened.

3. Amend § 17.95 by adding, in the same alphabetical order as these species occur in § 17.11(h):

a. In paragraph (g), critical habitat for the Cokendolpher cave harvestman (*Texella cokendolpheri*);

b. In paragraph (g), critical habitat for the Robber Baron Cave meshweaver (*Cicurina baronia*);

c. In paragraph (g), critical habitat for the Madla Cave meshweaver (*Cicurina madla*);

d. In paragraph (g), critical habitat for the Braken Bat Cave meshweaver (*Cicurina venii*);

e. In paragraph (g), critical habitat for the Government Canyon Bat Cave meshweaver (*Cicurina vespera*);

f. In paragraph (g), critical habitat for the Government Canyon Bat Cave spider (*Neoleptoneta microps*);

g. In paragraph (i), critical habitat for the ground beetle (no common name), (*Rhadine exilis*);

h. In paragraph (i), critical habitat for the ground beetle (no common name), (*Rhadine infernalis*); and

i. In paragraph (i), critical habitat for the Helotes mold beetle (*Batrisodes venyivi*).

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(g) Arachnids. * * *

Braken Bat Cave Meshweaver (*Cicurina venii*)

(1) Critical habitat for the Braken Bat Cave meshweaver in Bexar County, Texas, occurs in Unit 15 which is described in the text and depicted on Maps 1 and 7 under the ground beetle (*Rhadine infernalis*). The primary constituent elements and the exclusion of existing structures and associated landscaping as described in paragraphs (2) and (3) under the ground beetle *Rhadine exilis* are identical for this species.

Cokendolpher Cave Harvestman (*Texella cokendolpheri*)

(1) Critical habitat for the Cokendolpher cave harvestman occurs in Unit 20 as described below and depicted on Map 1 found under the ground beetle (*Rhadine exilis*) and Map 8 below. The primary constituent elements and exclusion of existing structures and associated landscaping as described in paragraphs (2) and (3) under the ground beetle *Rhadine exilis* are identical for this species.

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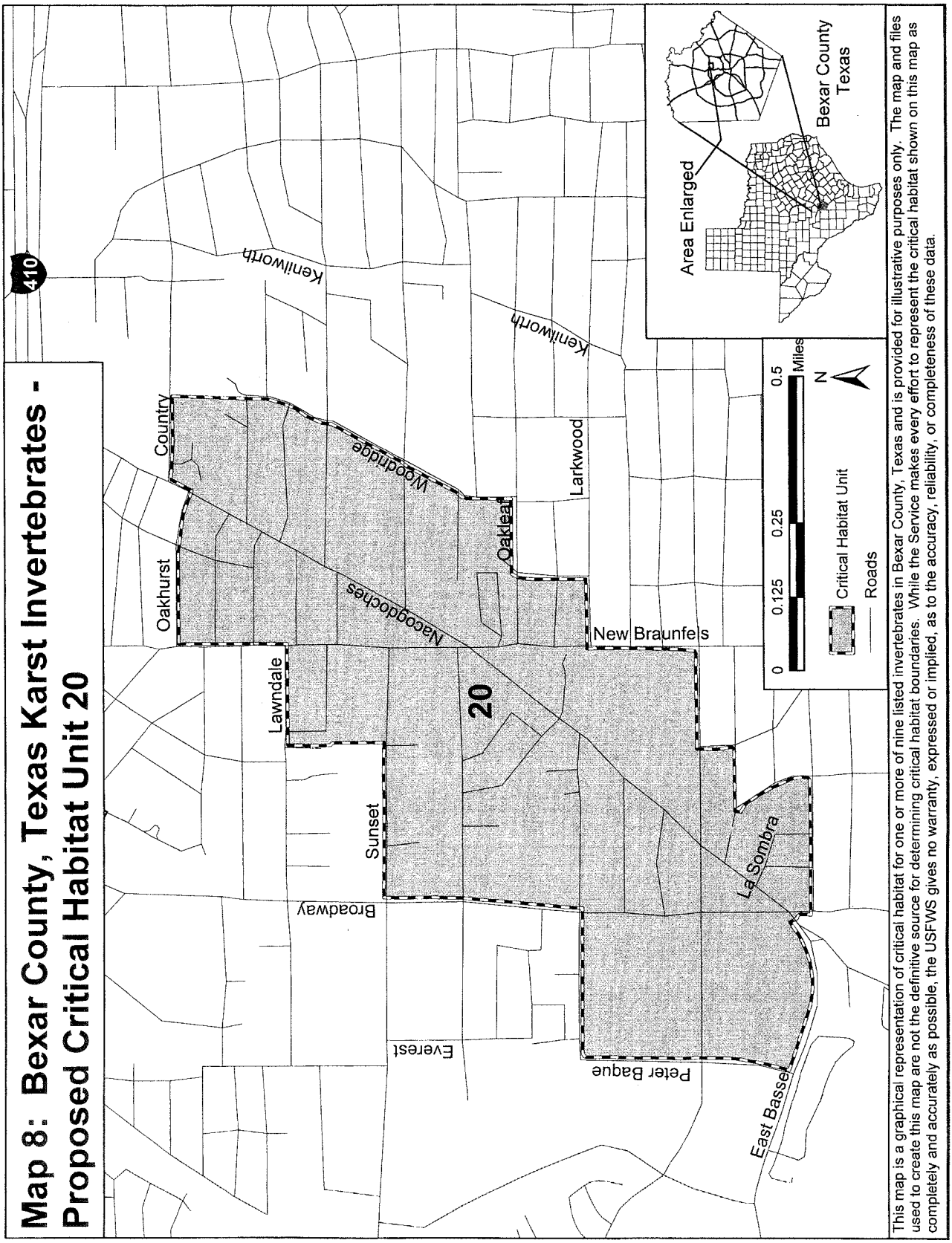

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(2) Surface vegetation within Unit 20 has been significantly reduced and degraded as a result of urban development. Lands within this unit do not contain the primary constituent element of a healthy surface community of native vegetation. Therefore, this unit is being designated as critical habitat based solely on the presence of an intact subsurface environment.

(3) Unit 20—(160 ha (395 ac)): From a point at the intersection of Basse Road and Peter Baque Road (2136763, 13728730), north along the east side of Peter Baque Road, then east along the south side of Lorenz Road, then north along the east side of Broadway, and continuing east along the south side of East Sunset Road to a point at 2139684, 13732380. From this point, north to Court Circle and continuing north along the east side of Court Circle, then east along the south side of Lawndale Avenue to New Braunfels and continuing north along the east side of New Braunfels to Oakhurst. From this point, east along the south side of Oakhurst to Nacogdoches, then north along the east side of Nacogdoches to Country and continuing east along the south side of Country to a point at 2142805, 13734290. From this point, south to a point at Woodridge Drive (2142796, 13733617), then continuing south along the west side of Woodridge Drive to Oakleaf Drive, then west along the north side of Oakleaf Drive to Woodbine, then continuing south along the west side of Woodbine to Larkwood Drive and continuing west along the north side of Larkwood to New Braunfels. From this point, south along the west side of New Braunfels to Robinhood Place and west along the north side of Robinhood Place to La Sombra, then continuing south on the west side of La Sombra to Claywell Drive. From this point, west along the north side of Claywell Drive to Nacogdoches and north along the east side of Nacogdoches to Basse Road, then continuing west along the north side of Basse Road to the point of origin.

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 which is described in the text and depicted on Maps 1 and 2 under the ground beetle (*Rhadine exilis*). The primary constituent elements and the exclusion of existing structures and associated landscaping as described in paragraphs (2) and (3) under the ground beetle *Rhadine exilis* are identical for this species.

Government Canyon Bat Cave Spider (*Neoleptoneta microps*)

(1) Critical habitat for the Government Canyon Bat Cave Spider (*Neoleptoneta microps*) in Bexar County, Texas, occurs in units 1a and 1b which are described in the text and depicted on Maps 1 and 2 under the ground beetle (*Rhadine infernalis*). The primary constituent elements and the exclusion of existing structures and associated landscaping as described in paragraphs (2) and (3) under the ground beetle *Rhadine exilis* are identical for this species.

Madla Cave Meshweaver (*Cicurina madla*)

(1) Critical habitat for the Madla Cave meshweaver in Bexar County, Texas, occurs in units 2, 3, 5, 8, and 10 which are described under the ground beetle (*Rhadine exilis*) and Unit 17 which is described under the ground beetle (*Rhadine infernalis*). In addition, critical habitat for the Madla Cave meshweaver occurs in Unit 1c as described below. These units are depicted on Maps 1, 2, 3, 4, and 5 found under the ground beetle (*Rhadine exilis*). The primary constituent elements, the exclusion of existing structures and associated landscaping, and the exclusion of lands that do not meet the definition of critical habitat as described in paragraphs (2) and (3) under the ground beetle *Rhadine exilis* and paragraph (2) under the ground beetle *Rhadine infernalis* are identical for this species.

(2) Unit 1c (47 ha (116 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2049690.24023, 13758634.2779; 2047438.24023, 13758634.2779; 2049690.24023, 13756382.2779; 2047438.24023, 13756382.2779.

Robber Baron Cave Meshweaver (*Cicurina baronia*)

(1) Critical habitat for the Robber Baron Cave meshweaver in Bexar County, Texas, occurs in Unit 20 which is described in the text and depicted in Map 8 found under the Cokendolpher cave harvestman as well as Map 1 found under the ground beetle (*Rhadine exilis*). The criteria upon which Unit 20 was designated as described in paragraph (2) under Cokendolpher cave harvestman is identical for this species. The primary constituent elements and the exclusion of existing structures and associated landscaping as described in paragraphs (2) and (3) under the ground beetle (*Rhadine exilis*) are identical for this species.

* * * * *

(i) Insects. * * *

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

(1) Critical habitat for the ground beetle (*Rhadine exilis*) in Bexar County, Texas, occurs in units 1b, 1e, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 21 as described below and as depicted on Maps 1, 2, 3, 4, 5, and 6 below. All coordinates are given in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83). Coordinates were derived from recent digital orthophotographs.

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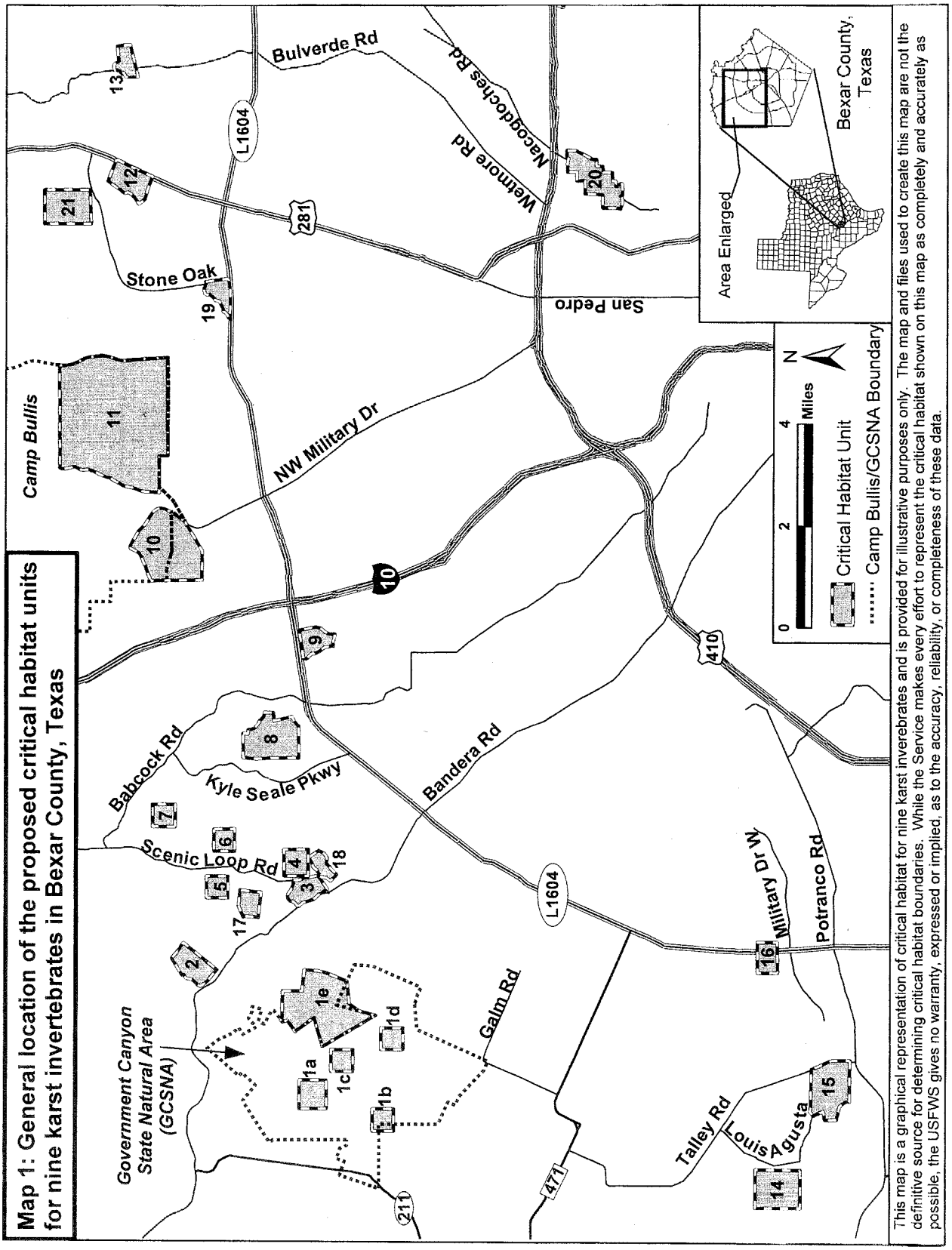
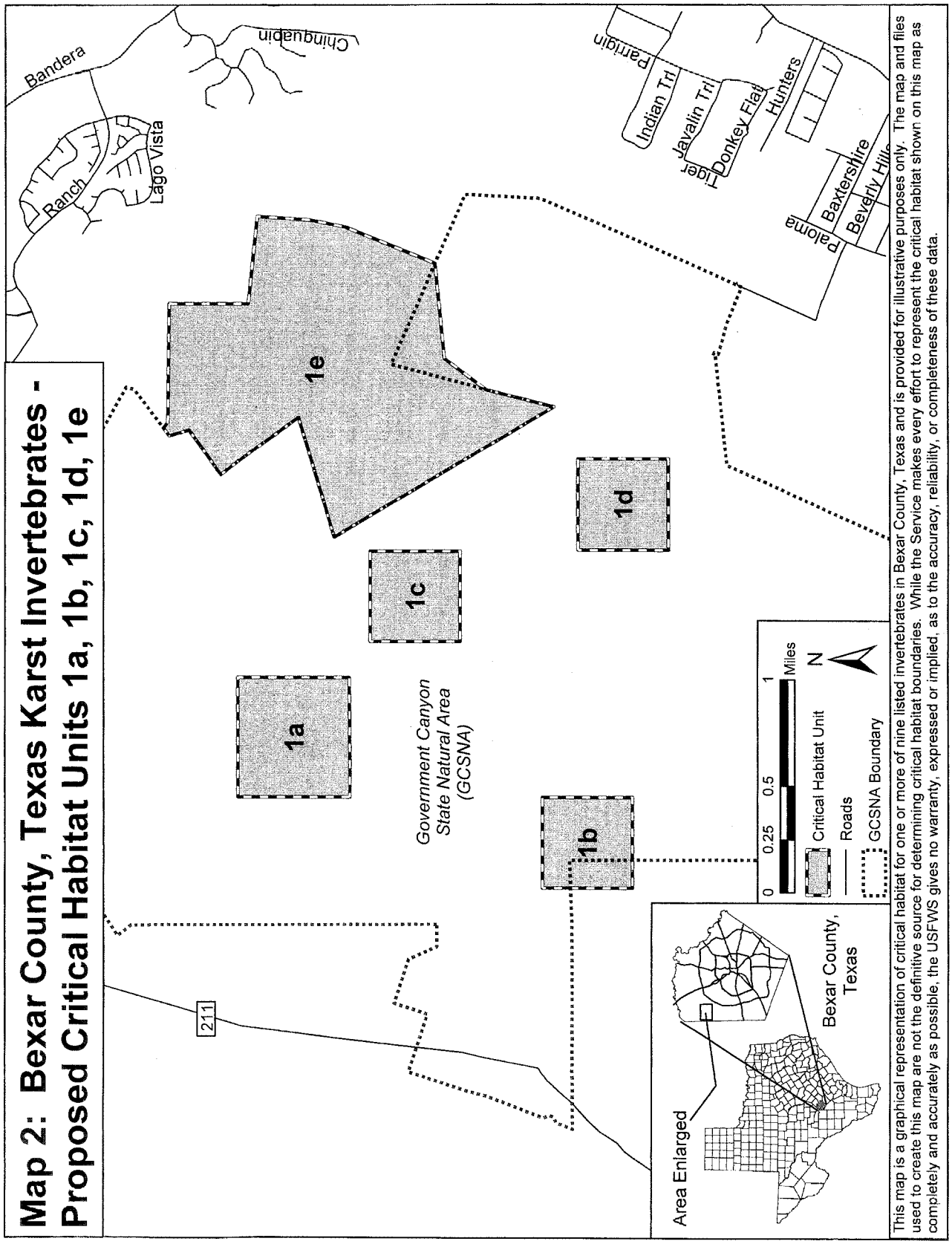
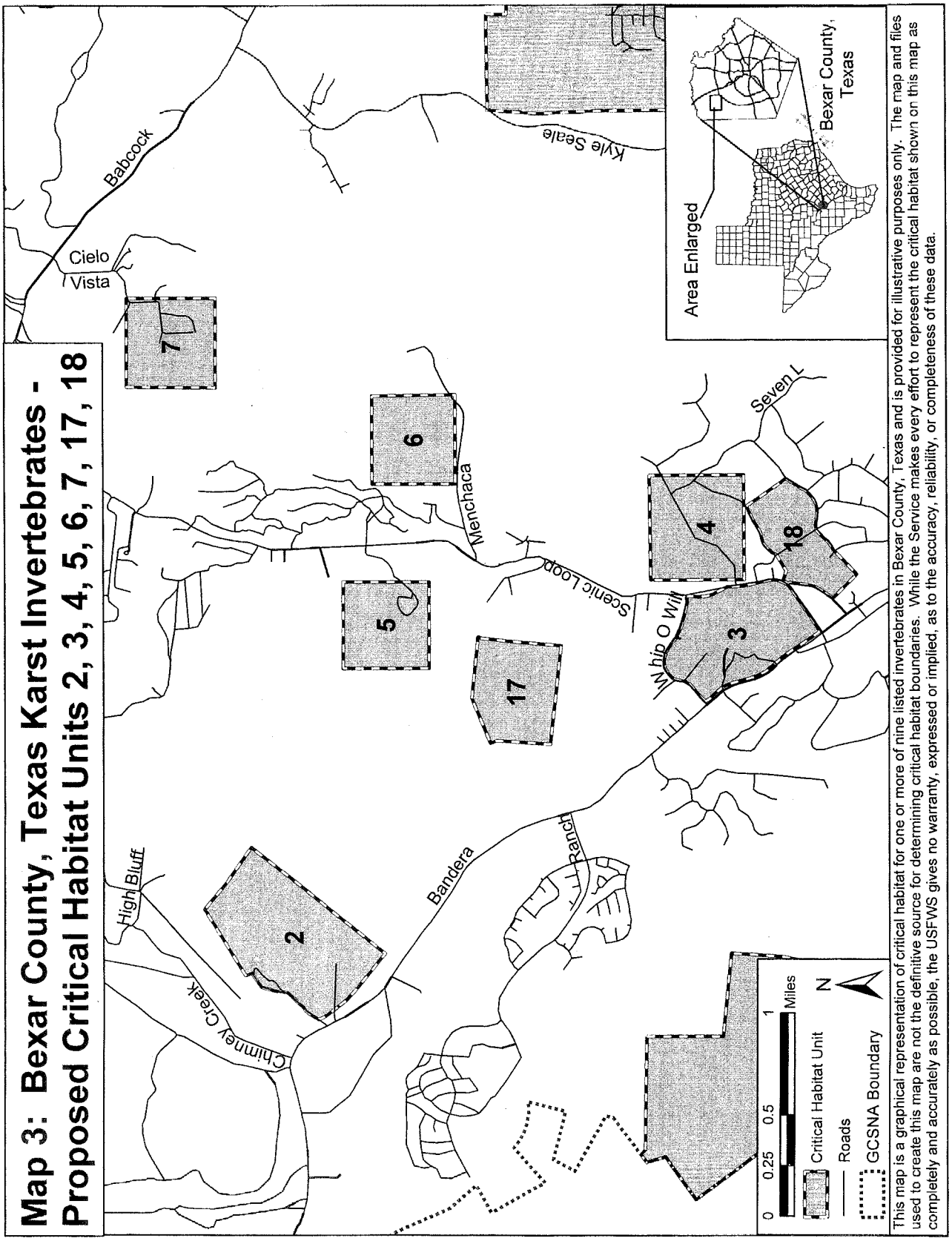
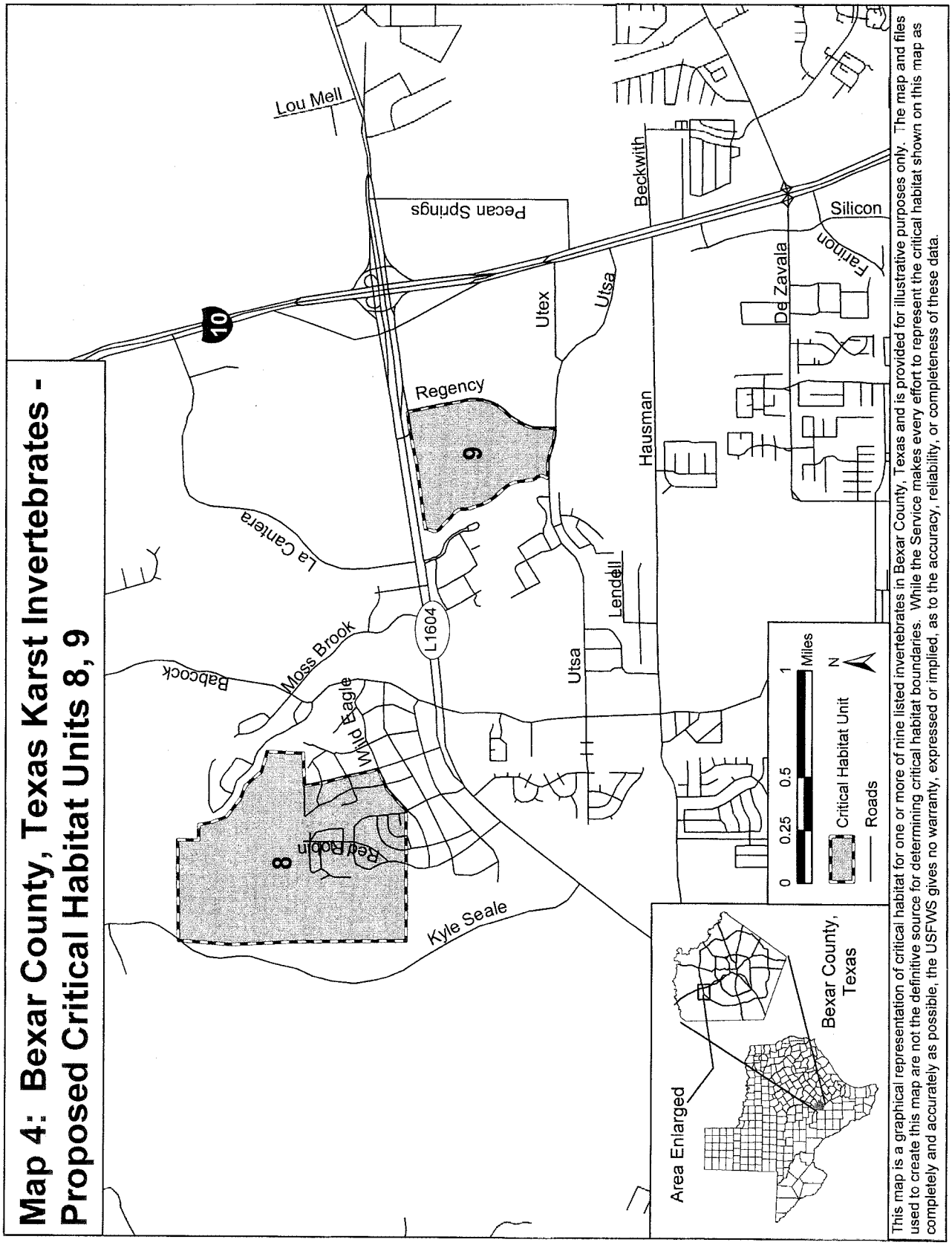
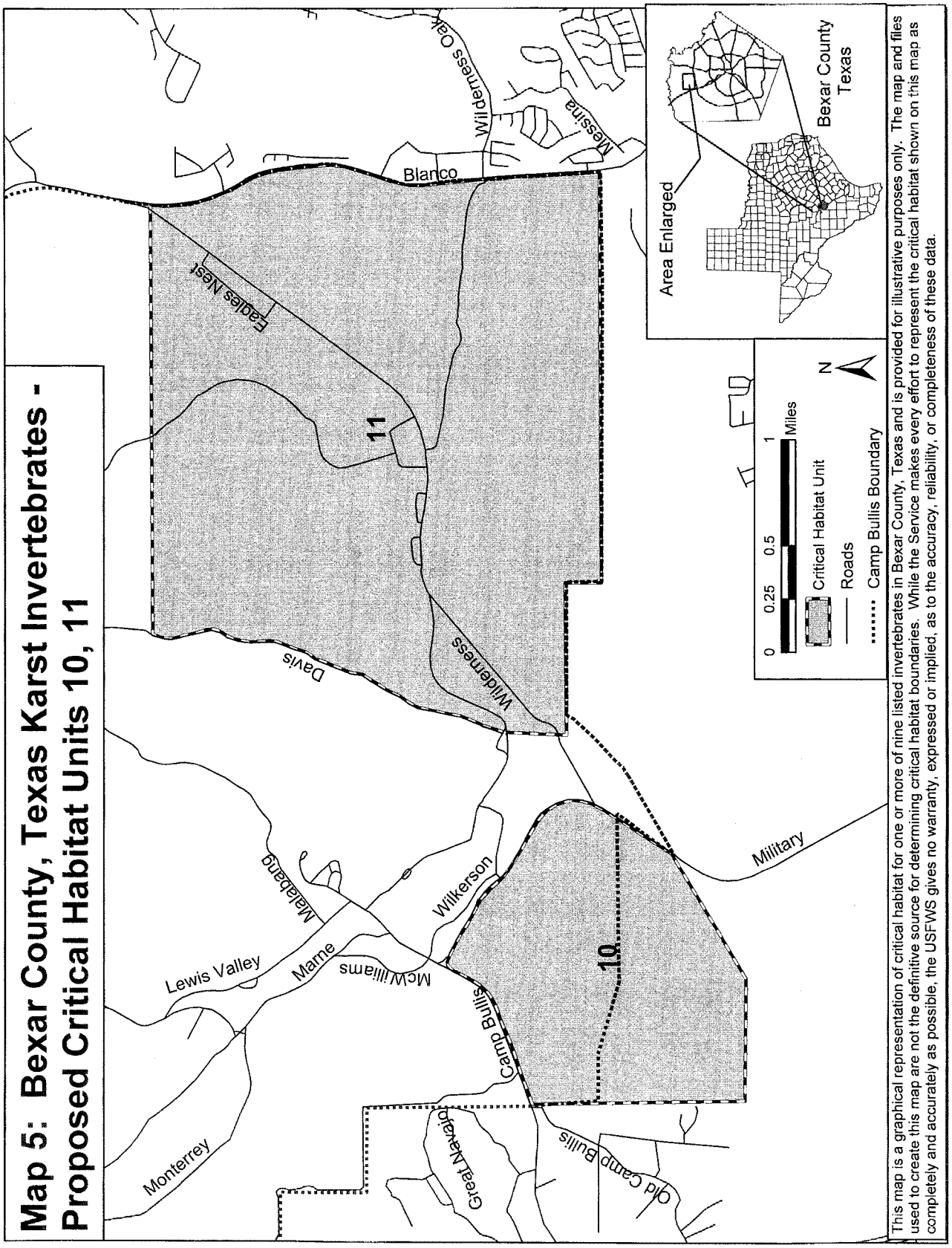
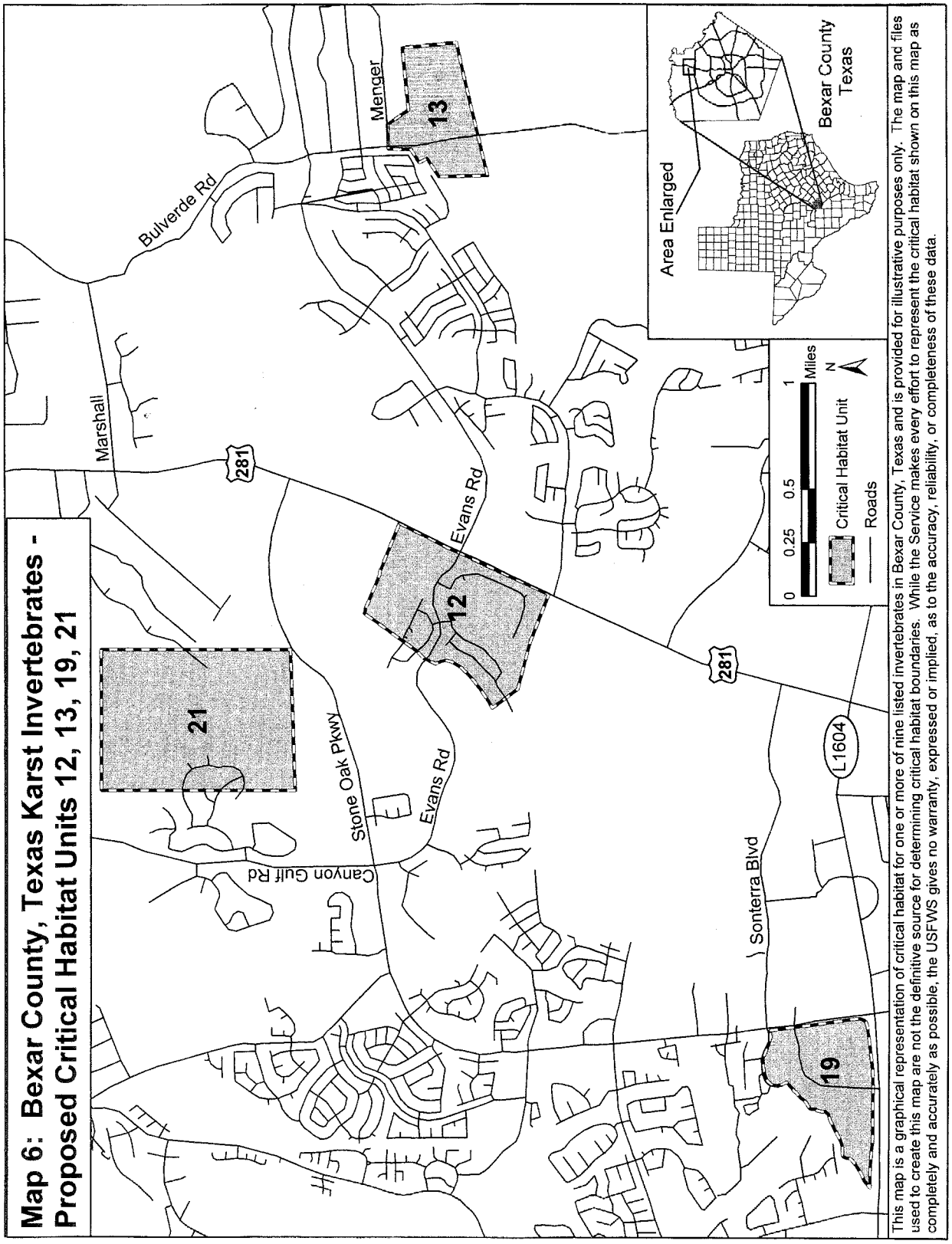

Map 1: General location of the proposed critical habitat units for nine karst invertebrates in Bexar County, Texas
Camp Bullis
Government Canyon State Natural Area (GCSNA)
Bulverde Rd
Stone Oak
NW Military Dr
Babcock Rd
Kyle Seale Pkwy
Scenic Loop Rd
Bandera Rd
Galm Rd
Talley Rd
Louis Agusta
Military Dr W
Potranco Rd
Wellmore Rd
Nacogdoches Rd
San Pedro
L1604
281
10
410
211
471
Area Enlarged
Bexar County, Texas
N
0
2
4
Miles
Critical Habitat Unit
Camp Bullis/GCSNA Boundary
This map is a graphical representation of critical habitat for nine karst inverebrates and is provided for illustrative purposes only. The map and files used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.


Map 2: Bexar County, Texas Karst Invertebrates - Proposed Critical Habitat Units 1a, 1b, 1c, 1d, 1e
Bandera
Lago Vista
Ranch
Chinquapin
Parrigin
Indian Trl
Javalin Trl
Donkey Flat
Hunters
Paloma
Baxtershire
Beverly Hills
1e
1d
1c
1a
1b
Government Canyon State Natural Area (GCSNA)
211
0 0.25 0.5 1 Miles
N
Critical Habitat Unit
Roads
GCSNA Boundary
Area Enlarged
Bexar County, Texas
This map is a graphical representation of critical habitat for one or more of nine listed invertebrates in Bexar County, Texas and is provided for illustrative purposes only. The map and files used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.


Map 3: Bexar County, Texas Karst Invertebrates - Proposed Critical Habitat Units 2, 3, 4, 5, 6, 7, 17, 18
Babcock
Cielo Vista
Kyle Seale
Menchaca
Seven L
Scenic Loop
Whip O Will
High Bluff
Chimney Creek
Bandera
Ranch
Area Enlarged
Bexar County, Texas
2
3
4
5
6
7
17
18
0 0.25 0.5 1 Miles
Critical Habitat Unit
Roads
GCSNA Boundary
N
This map is a graphical representation of critical habitat for one or more of nine listed invertebrates in Bexar County, Texas and is provided for illustrative purposes only. The map and files used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.


Map 4: Bexar County, Texas Karst Invertebrates - Proposed Critical Habitat Units 8, 9
Lou Mell
Pecan Springs
Beckwith
Silicon
Falcon
De Zavala
Utex
Utsa
Regency
9
Hausman
La Cantera
Moss Brook
Babcock
L1604
Lendell
Utsa
Wild Eagle
Red Robin
8
Kyle Seale
0 0.25 0.5 1 Miles
N
Critical Habitat Unit
Roads
Area Enlarged
Bexar County, Texas
This map is a graphical representation of critical habitat for one or more of nine listed invertebrates in Bexar County, Texas and is provided for illustrative purposes only. The map and files used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.


Map 5: Bexar County, Texas Karst Invertebrates - Proposed Critical Habitat Units 10, 11
Wilderness Oak
Blanco
Messina
Eagles Nest
11
Davis
Wilderness
Malabang
Wilkerson
Lewis Valley
Marne
McWilliams
Camp Bullis
10
Military
Monterrey
Great Navajo
Old Camp Bullis
Area Enlarged
Bexar County Texas
0 0.25 0.5 1 Miles
Critical Habitat Unit
Roads
Camp Bullis Boundary
N
This map is a graphical representation of critical habitat for one or more of nine listed invertebrates in Bexar County, Texas and is provided for illustrative purposes only. The map and files used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



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(2) Within these areas the primary constituent elements include: (a) the physical features of karst-forming rock containing subterranean spaces with stable temperatures, high humidities (near saturation) and suitable substrates (for example, spaces between and underneath rocks suitable for foraging and sheltering), and (b) the biological features of a healthy surface community of native plants (for example, juniper-oak woodland) and animals (for example, cave crickets) surrounding the karst feature that provides nutrient input and buffers the karst ecosystem from adverse effects (from, for example, non-native species invasions, contaminants, and fluctuations in temperature and humidity).

(3) Existing human-constructed, above ground, impervious structures and associated landscaping within the boundaries of mapped units do not contain the primary constituent elements and are not considered to be critical habitat. Such features and structures include but are not limited to buildings, paved roads, and lawns. However, areas below ground under these structures and associated landscaping are considered to be critical habitat since subterranean spaces containing these species and/or transmitting moisture and nutrients through the karst ecosystem extend, in some cases, underneath these existing human-constructed structures.

(4) Seven caves and their associated preserve lands established under the La Cantera section 10(a)(1)(B) permit were excluded from the proposed critical habitat designation. These include Canyon Ranch Pit, Fat Man's Nightmare Cave, and Scenic Overlook Cave and the surrounding approximately 30 ha (75 ac) (within Unit 1e); Helotes Blowhole and Helotes Hilltop caves and the surrounding approximately 10 ha (25 ac) (within Unit 3); John Wagner Cave No. 3 and the surrounding approximately 4 acres (within Unit 6); Hills and Dales Pit and the surrounding approximately 28 ha (70 ac) (within Unit 8). As required under their permit, La Cantera purchased these karst preserves through conservation easement and/or fee simple title and will ensure that they will be preserved in perpetuity and managed in accordance with the conservation needs of the species.

(5) Unit 1b—(47 ha (116 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2043579.74934, 13754314.707; 2041327.74934, 13754314.707; 2043579.74934, 13752062.707; 2041327.74934, 13752062.707.

(6) Unit 1e—(341 ha (842 ac)): From a point at 2050035, 13759440 at the western corner of property number 902601605 east along the northern side of this property to a point at 2053120, 13760090 the continuing northwest along the west side of property numbers 902601605, 323075421, and 323075422 to at point at 2051713, 13762282. From this point, northeast along the north side of property numbers 323075422 and 902601659 at a point at 2052904, 13763744 then east to a point at 2057992, 13761497. From this point, along the east side of property number 323075422 it its intersection with property number 902601607 at point 2055759, 13761684 and continuing along the north and east sides of this property to its intersection with property number 328074996 a point at 2056900, 13756956. From this point, west across property number 328074996 to a point at 2054491, 13756784, then southwest to a point at 2053656, 13755987 then continuing south along the east side of property number 902601605 to a point at 2053217, 13753954. From this point, along the west side of property number 902601605 and continuing to the point of origin.

(7) Unit 2—(99 ha (245 ac)): From a point northeast of Bandera Road at 2056212, 13772285 and along the northwest boundary of parcel numbers 102700035,102700038 and 304031966 to a point at 2059148.29808, 13775208.8182. From this point, southeast to a point at 2060764.66944, 13773969.8333 then along the eastern boundaries of parcel numbers 314033835, 327077286, 327077287, 102800425, and 102700316 to a point at 2057993.6191, 13770481.7691. From this point, northwest to the point of origin.

(8) Unit 3—(63 ha (154 ac)): From the southeastern corner of the intersection of Bandera Road and Whip-O-Will Way (2064533, 13762115) along the south side of Whip-O-Will Way to its intersection with Scenic Loop Road (2067284, 13762583), then continuing south along the west, northwest side of Scenic Loop Road to its intersection with Bandera Road (2066368, 13759105). From this point, north along the east side of Bandera Road to the point of origin.

(9) Unit 4—(63 ha (154 ac): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2070429.51759, 13763548.8939; 2067696.85493, 13763518.531; 2070444.69905, 13761074.316; 2067706.57475, 13761075.054.

(10) Unit 5—(47 ha (116 ac): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2067655.77864, 13771578.6572; 2065403.77864, 13771578.6572; 2067655.77864, 13769326.6572; 2065403.77864, 13769326.6572.

(11) Unit 6—(45 ha (111 ac): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2072498.41982, 13770816.0997; 2070213.53298, 13770816.0997; 2072523.11604, 13768630.4844; 2070213.53298, 13768630.4844.

(12) Unit 7—(50 ha (123 ac): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2075042.48817, 13777212.4498; 2072740.24441, 13777212.4498; 2075042.48817, 13774888.2263; 2072720.54786, 13774894.8227.

(13) Unit 8—(174 ha (428 ac): From a point 2079943.53971, 13767755.6785 along the east side of Kyle Seale Parkway to a point at 2082440.28711, 13767779.6857, south to a point at 2082429.79996, 13767253.8126 then east to a point at 2082818.17238, 13767241.1953. From this point, along the northern side of parcel number 309072242 southeast to a point at 2084641.50301, 13765539.4201, south to a point at 2084605.03639, 13764652.0659 then west to a point at 2083790.61538, 13764615.5992. From this point south along the west side of White Fawn Drive and continuing southwest along the north side of Wild Eagle Road to its intersection with Cotton Tail. From this point, west to a point at 2079949.46553, 13762062.9364 then continuing north to the point of origin.

(14) Unit 9—(71 ha (175 ac): From at point at 2090191, 13761607, roughly the intersection of an unnamed tributary of Leon Creek and the south side of the Loop 1604 access road, to the intersection of the access road and Regency Boulevard (2093082, 13762048). From this point, south along the west side of Regency Boulevard to its intersection with UTSA Boulevard (2092690, 13758365), then west along the north side of UTSA Boulevard to a point at 2091449, 13758365, roughly the intersection of UTSA Boulevard and the

unnamed tributary of Leon Creek. From this point, north along the unnamed tributary to the point of origin.

(15) Unit 10—(367 ha (906 ac)): From a point at 2098282, 13772161 at the southwest corner of parcel number 900200036 north along the western boundary of this parcel and parcel number 308042407 to its intersection with Camp Bullis Road then continuing east along the south side of Camp Bullis Road/Military Road to a point at 2105279, 13775376. From this point, in a straight line southwest to a point at 2100600, 13772093 and continuing west along a straight line to the point of origin.

(16) Unit 11—(1,273 ha (3,143 ac)): From a point at 2109871, 13786962 east to its intersection with Blanco Road (2120517, 13787010), then south along the west side of Blanco Road to a point at 2121336, 13775793. From this point west to the southeast corner of parcel number 308042407, then west along this parcel boundary to a point at 2107371, 13776670, then north to Davis (2107420, 13778177). From this point, north, northeast along Davis to the point of origin.

(17) Unit 12—(105 ha (258 ac)): From a point at 2140092, 13777425 at the west side of U.S. 281 northwest in a straight line to a point at 2139015, 13777798 and continuing northwest in a straight line to a point at 2137707, 13778176 at the southwest corner of parcel number 311074749. From this point, continuing along the southwest boundary of this parcel across Cactus Bluff and along the southwest boundary of parcel number 311074761 to a point at 2137298, 13778787 at the west side of Mud Creek and continuing northeast along the west side of Mud Creek to a point at 2138316, 13780237. From this point, crossing parcel number 308040085 and Evans Road to a point at 2138477, 13780521. From this point, northeast along a straight line to a point at 2139612, 13782045, then southeast to a point at 2141858, 13781138 on the west side of U.S. 281 then continuing southwest along straight line to the point of origin.

(18) Unit 13—(51 ha (125 ac)): From a point at 2151154.85239, 13781383.2606 on the west side of the right-of-way of Bulverde Road, east along the south side of Ridgeway Drive to a point at 2151768.28065, 13781397.6942 then southeast to a point at 2152129.1208, 13780885.3011. From this point, east along the north side of parcel number 327077436 to a point at 2153655.9118, 13781029.8389, south at a point at 2153780.292, 13779672.9217 then south west to a point at 2150481.68089, 13778900.3523. From this point, north to a point at 2150462.0393, 13780127.5368, northeast to a point at 2150916.69789, 13780416.209, northwest to a point at 2150815.66265, 13780618.2794 then northeast to a point at 2151140.41879, 13780827.5667 and continuing north to the point of origin.

(19) Unit 21—(155 ha (382 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2138699.75321, 13788566.4781; 2135213.28358, 13788585.4663; 2138699.75321, 13783861.5804; 2135213.28358, 13783753.9781.

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

(1) Critical habitat for the ground beetle (*Rhadine infernalis*) in Bexar County, Texas, occurs in units 1b, 1e, 2, 3, 4, 5, 6, 8, and 10 which are described under the ground beetle (*Rhadine exilis*). In addition, critical habitat for the ground beetle (*Rhadine infernalis*) occurs in units 1a, 1d, 14, 15, 16, 17, 18, and 19, as described below. These units are depicted on Maps 1, 2, 3, 4, 5, and 6 found under the ground beetle (*Rhadine exilis*) and on Map 7 below. The primary constituent elements, the exclusion of existing structures and associated landscaping, and the exclusion of lands that do not meet the definition of critical habitat as described in paragraphs (2), (3), and (4) under the ground beetle *Rhadine exilis* are identical for this species.

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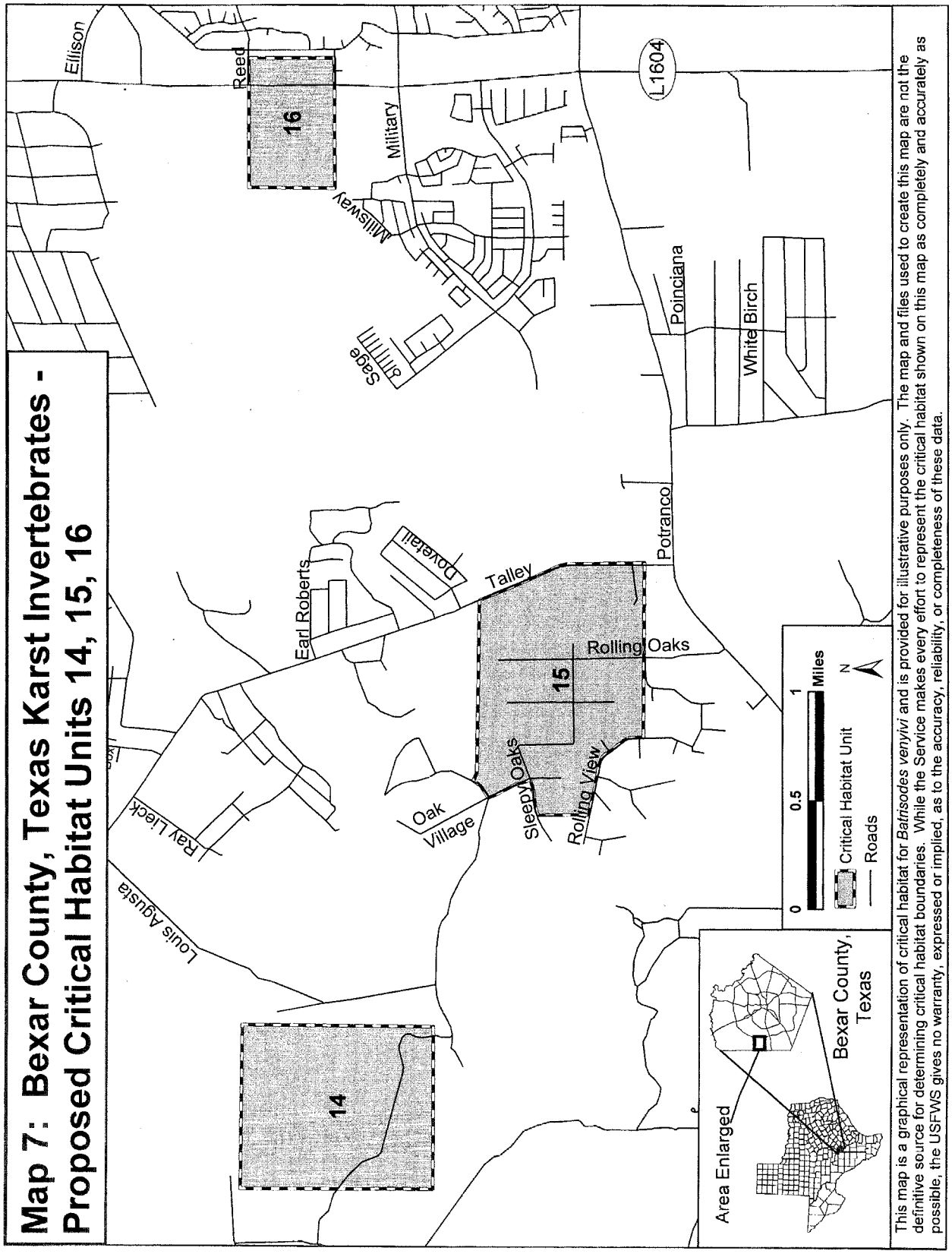

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(2) Within Unit 17, one cave and its surrounding preserve area (Madla's Cave and the surrounding approximately 2 ha (5 ac)) was excluded from the proposed critical habitat designation. As required by their section 10(a)(1)(B) permit, La Cantera purchased this karst preserve and will ensure that it will be preserved in perpetuity and managed in accordance with the conservation needs of the species.

(3) Surface vegetation within Unit 19 has been significantly reduced and degraded as a result of urban development. Lands within this unit do not contain the primary constituent element of a healthy surface community of native vegetation. Therefore, this unit is being designated as critical habitat based solely on the presence of an intact subsurface environment.

(4) Unit 1a—(76 ha (188 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2046534.1202, 13761922.7115; 2043576.6972, 13761922.7116; 2046534.1202, 13759160.7825; 2043576.6972, 13759144.7312.

(5) Unit 1d—(47 ha (116 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2051979.54342, 13753424.1693; 2049727.54342, 13753424.1693; 2051979.54342, 13751172.1693; 2049727.54342, 13751172.1693.

(6) Unit 14—(173 ha (426 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2037495.68795, 13714343.6913; 2033513.40946, 13714379.0476; 2037458.92845, 13709675.2356; 2033521.81129, 13709675.2356.

(7) Unit 15—(195 ha (481 ac)): From a point at 2044508, 13704550 and continuing along the east side of Rolling View to a point at 2042620, 13705900. From this point, north along a straight line to a point at 2042634, 13706518 at the south end of Honey Oaks and continuing along the east side of Honey Oaks to Sleepy Oaks then along the south side of Sleepy Oaks to its intersection with Oak Village. From this point, continuing north along the east side of Oak Village to Pheasant Drive, then northeast along a straight line to a point at 2043413, 13708727 and continuing along the same line to a point at 2047835, 13708557 on the west side of Talley Road, and continuing south along the west side of Talley Road to a point at 2048750, 13704509 and continuing west along a straight line to the point of origin.

(8) Unit 16—(61 ha (152 ac)): Unit consists of four boundary points with the following coordinates in Texas State Plane (South Central) in feet, referenced to North American Horizontal Datum 1983 (NAD 83): 2061031.60542, 13714210.5326; 2057866.88036, 13714211.0248; 2061031.60542, 13712132.5655; 2057845.30553, 13712123.6599.

(9) Unit 17—(48 ha (118 ac)): From a point 2063406, 13766153 and continuing along the western boundary of parcel numbers 102800326 and 307020398 and along the west and north boundaries of parcel number 102800384 to a point at the northeast corner of parcel number 102800384 (2064828, 13768192). From this point, continuing along the northern boundary of parcel numbers 327075063 and 327075065 to the northeast corner of parcel number 327075065 (2066218, 13768044), then south along the east boundary of parcel numbers 327075065, 102800456, and 102800326 to a point at 2065992, 13765864, then continuing west across parcel number 102800326 to the point of origin.

(10) Unit 18—(40 ha (100 ac)): From the intersection of Old Scenic Loop Road and Scenic Loop Road (2067675, 13760046), northeast along the northern boundary of parcel number 507100487 to the intersection on Monarch Drive and Cash Mountain (2068346, 13760229), then along the southern side of Cash Mountain to the point at 2069624, 13761023. From this point, southeast along a straight line to the intersection with Rafter South Trail at a point at 2070338, 13759988, then along the north side of Rafter South Trail to its intersection with Bar X Trail. From this point, southwest along a straight line to a point at 2067849, 13758117, then northwest to Old Scenic Loop Road (2067231, 13758743) and continuing north along the southeast side of the road to the point of origin.

(11) Unit 19—(59 ha (146 ac)): From a point at 2125364, 13769352 where the Loop 1604 access road intersects Panther Springs Creek, north along Panther Springs Creek to a point at 2127295, 13770776, then continuing northeast along a straight line to a point at 2127967, 13771448 at the southern end of Sonterra Boulevard. From this point, north and east along the east side of Sonterra Boulevard to its intersection with Stone Oak Parkway (2129268, 13771861), then continuing south along the west side of Stone Oak Parkway to its intersection with the Loop 1604 access road and continuing west along a straight line to the point of origin.

Helotes mold beetle (*Batrisodes venyivi*)

(1) Critical habitat for the Helotes mold beetle in Bexar County, Texas, occurs in units 1e, 3, and 5 which are described in the text and depicted on Maps 1, 2, and 3 found under the ground beetle (*Rhadine exilis*). The primary constituent elements, the exclusion of existing structures and associated landscaping, and the exclusion of lands that do not meet the definition of critical habitat as described in paragraphs (2), (3), and (4) under the ground beetle *Rhadine exilis* are identical for this species.

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Dated: August 3, 2002.

Craig Manson,

Assistant Secretary for Fish and Wildlife and Parks.

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