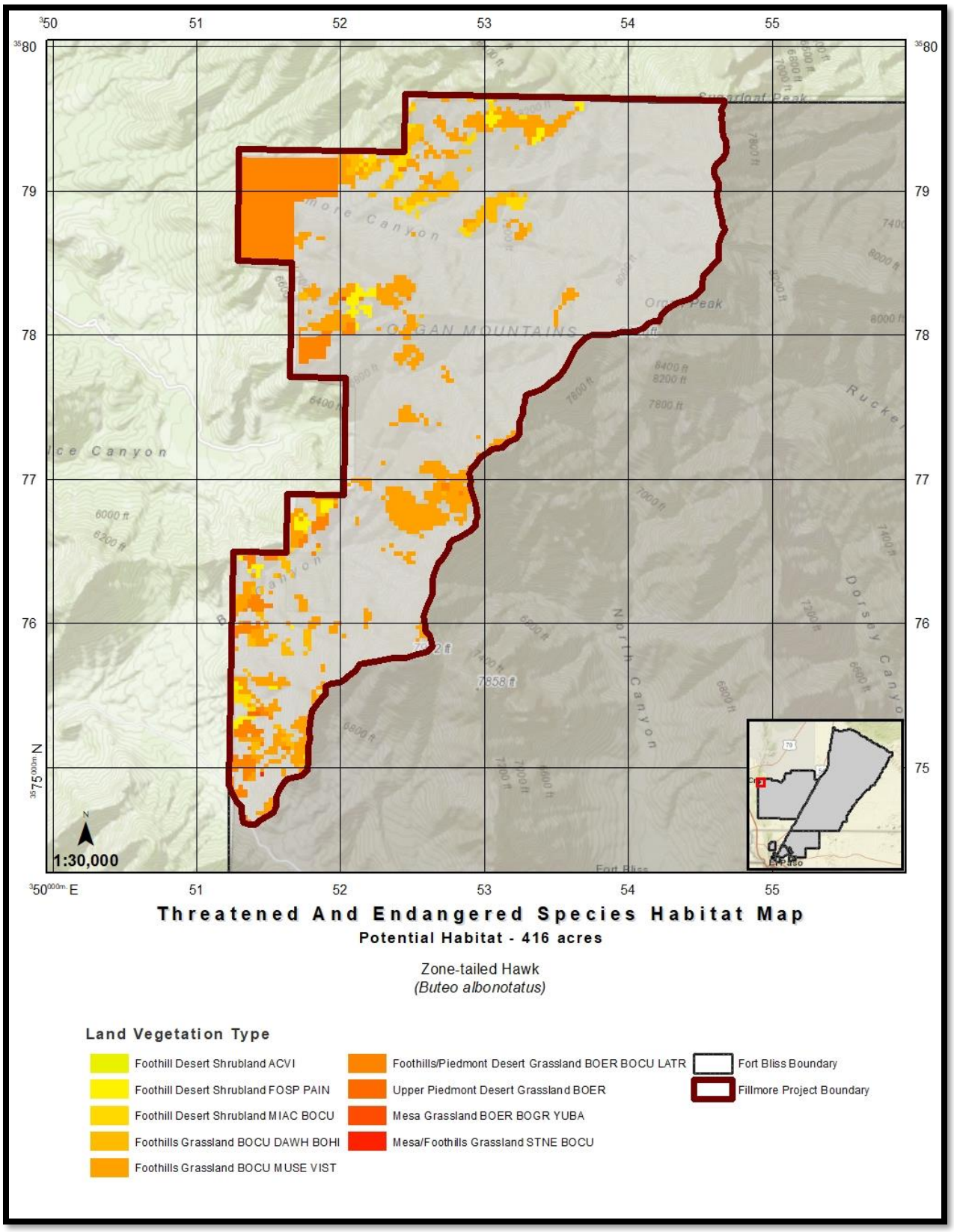
Figure 3.3-22. Potential habitat assessment map for Zone-tailed Hawk



3.4 Flora

3.4.1 Alamo Beardtongue (*Penstomon alamoensis*)

Species Description

Alamo Beardtongue (*Penstomon alamoensis*) is perennial herb with a basal rosette of leaves stem are solitary or few. Low growing, but never forming mats, inconspicuous until it flowers. Produces bright red flowers that flare at the tips, fruits mature in early fall. Measuring about 91 cm (3 ft), it has opposite basal leaves, stem leaves are small and come in pairs of two to four (U.S. Army 1998).

Habitat Requirements and Limiting Factors

The Alamo beardtongue is a regional endemic of south-central New Mexico with populations occurring in north-facing sheltered rocky areas, canyon sides, and canyon bottoms on limestones between 1310 to 1615 m (4,300 and 5,300 ft) in elevation (NMNPPAC 1984). It is known from the Sacramento and San Andres Mountains on White Sands Missile Range. When there is ample winter moisture the plant is abundant, but drought reduces populations numbers (Spellenberg 1981).

Fort Bliss has confirmed observations of the Alamo beardtongue, however none of these observations were located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

3.4.2 Cereus Night-blooming Cereus (*Peniocereus greggii*)

Species Description

The Night-blooming Cereus (*Peniocereus greggii*) perennial with erect or sprawling stems, are solitary or few. Can grow to 2.4 m in length but are typically less than 1.5 m. The gray, brown stems are four to five ribbed and approximately 1.25 cm in diameter. Known for its remarkable large flower, having waxy white pointed petals with numerous white to yellow-tipped stamens. It is fragrant and up to 5cm in diameter and 15cm long. It produces a bright orange-red oblong fruit 7.6 cm long and 3.8 cm in diameter with short spines. The root is a fleshy taproot and typically weighs 2.3 to 6.8 kg (Earle 1963, Weniger 1991). In 1919, the only known specimen with purplish flowers was collected from Organ, New Mexico (Weniger 1969).

Habitat Requirements and Limiting Factors

The Night blooming cereus grows in southern New Mexico, southeastern Arizona, western Texas down into central Mexico (Kearney et al 1960). It prefers habitats in dry alluvial soils that are mostly sandy to silty gravelly soils at elevations above 1200 m. It prefers gently broken to level terrain in desert grassland or Chihuahuan desert scrub. Typically found growing up through and supported by shrubs, especially creosote bush (*Larrea tridentata)* and honey mesquite (*Prosopis glandulosa*) (Ferguson 1998).

Fort Bliss has several confirmed observations of the Night blooming Cereus, however none of these observations occur in or near the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no

observations. Based on the habitat requirements needed to support this species, the habitat assessment maps indicated there is no potential habitat within the project footprint.

3.4.3 Crested Coralroot (*Hexalectris spicata*)

Species Description

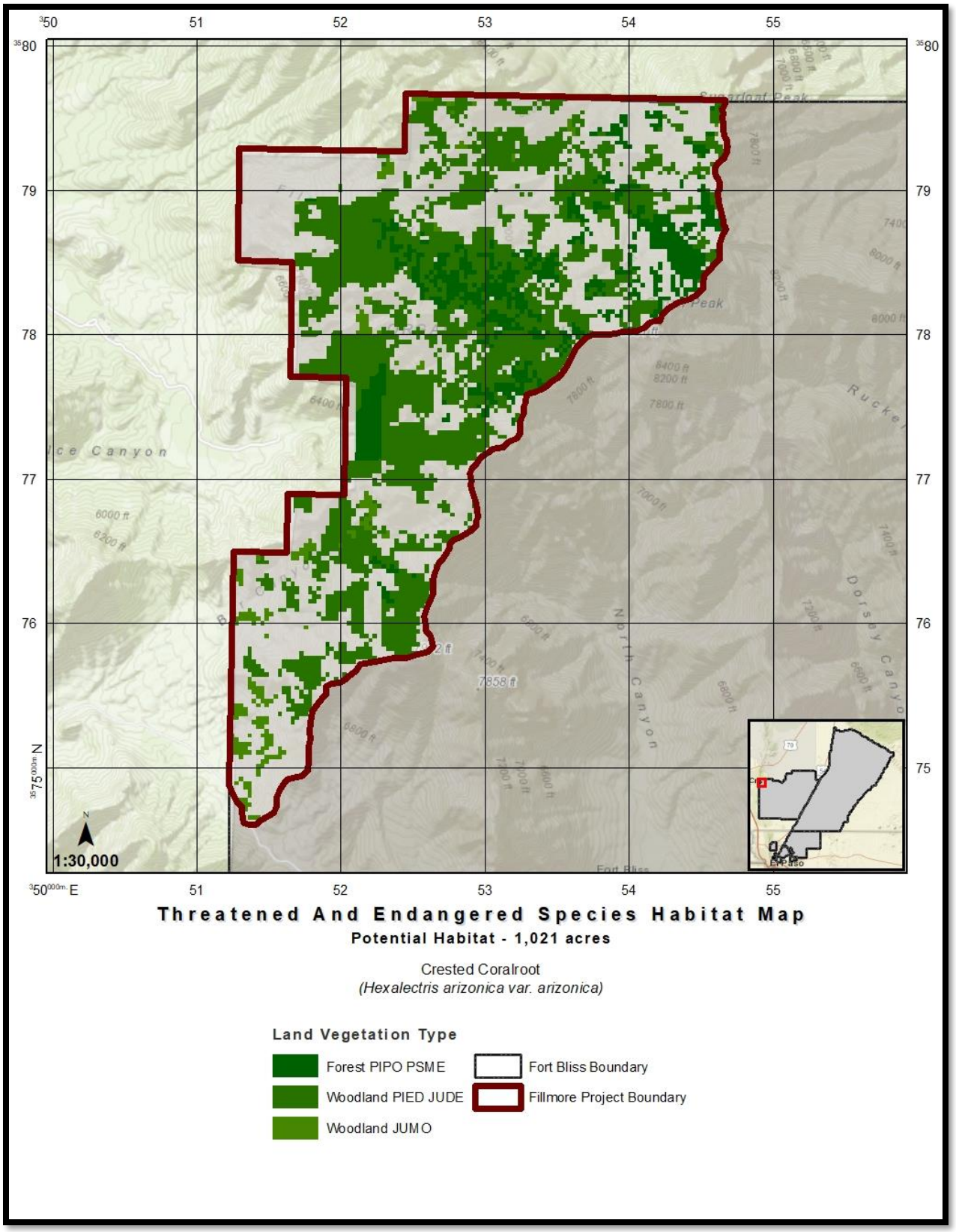
The Crested Coralroot (*Hexalectris spicata*) is an unusual plant in the orchid family. Its Latin name refers to the raised ridges on the lip that resemble a rooster's nest, and "spicata" refers to the flowers being produced on a spike. It is called the crested coralroot because of the rhizomatous nature of the species where the twisted roots look like corals. A saprophytic orchid, living off fungi and decaying organic matter, it contains no chlorophyll and is therefore not green. Because it does not photosynthesize it does not produce leaves. The flowering stems are light brown and easily overlooked in the tall grass or leaf litter. The subtle flowers reveal spectacular beauty when closely examined.

Habitat Requirements and Limiting Factors

The Crested Coralroot can be found in neutral calcareous, well drained areas like limestone glades and oak-hickory woodlands rooted in small accumulations of alkaline soil in crevices of limestone rock, and in rich woods in mountains, where rocks are not calcareous (Wherry 1927).

Fort Bliss NRDB was reviewed and only two observations for Crested coralroot were collected in September of 1990 and 1992. These observations occurred just outside project footprint in North Canyon. INaturalist observation database was also reviewed to confirm any observations near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map showed 1,021 acres (16%) potential habitat within the project footprint (**Figure 3.4-1**).

Figure 3.4-1. Potential habitat assessment map for Crested Coralroot



3.4.4 Nodding Cliff Daisy (*Perityle cernua*)

Species Description

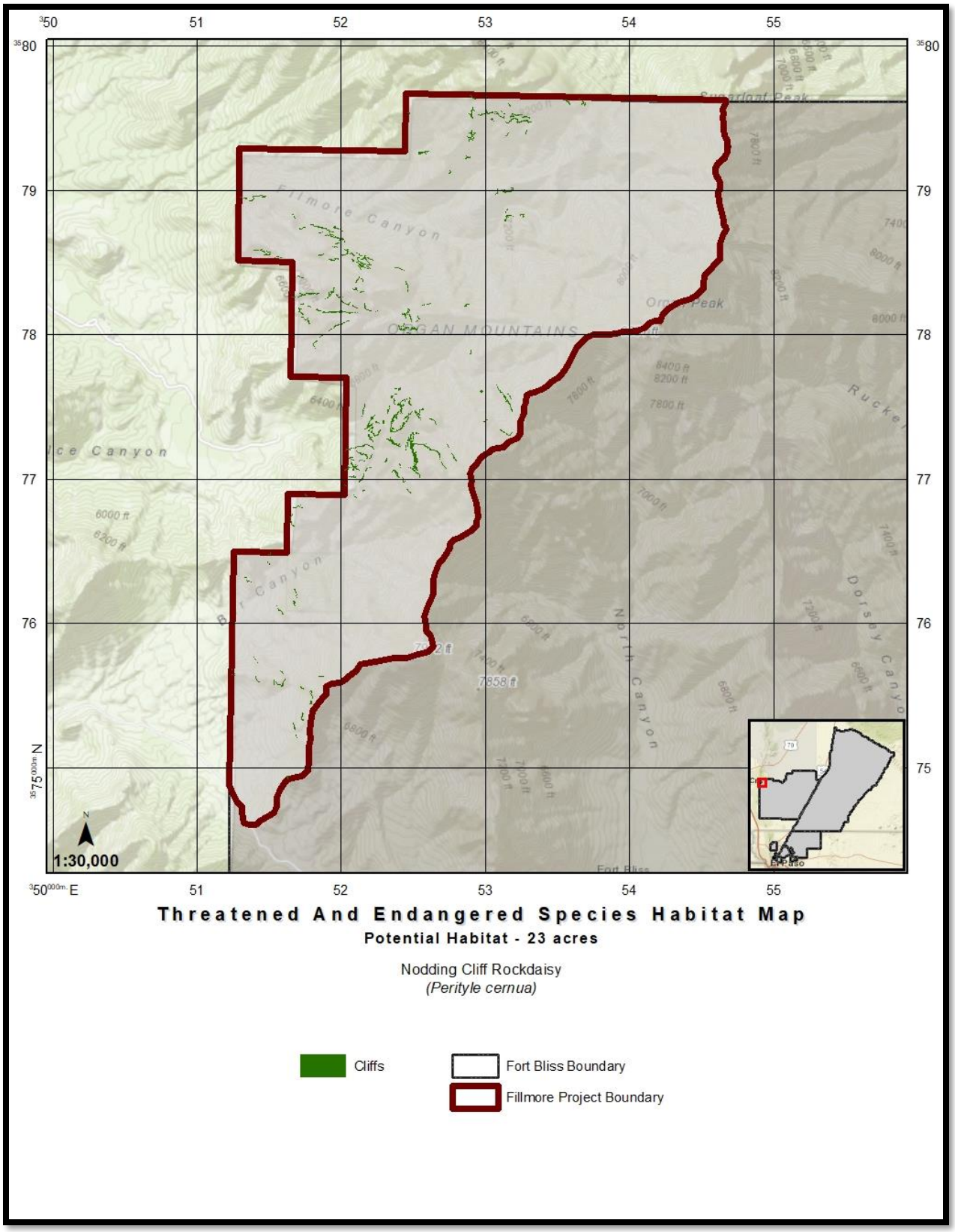
The Nodding Cliff Daisy (*Perityle cernua*) is a small perennial herb endemic to the Organ Mountains of New Mexico. It has a woody base, leafy stems that grow to about 10 cm long, and alternate or opposite leaves with noticeably short petioles, and broadly rounded-triangular blades. Flower heads are golden-yellow, rayless, solitary, held barely above the leaves on nodding peduncles. Flowers from June to September (Barlow et al 1999).

Habitat Requirements and Limiting Factors

This is a cliff dwelling species of daisy that inhabits igneous cliffs, primarily on rhyolite, occasionally on andesite, at elevations of 1,520-2,680 m (5,000-8,800 ft). It is a narrow endemic of the Organ Mountains (Barlow et al 1999).

Fort Bliss has historical records for the Nodding Cliff daisy all occurring within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded few observations on the southeastern end of the Organ Mountains, well outside the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map showed only 23 acres (31%) of potential habitat within the project footprint (**Figure 3.3-2**).

Figure 3.4-2. Potential habitat assessment map for Nodding Cliff Daisy



3.4.5 Organ Mountain evening primrose (*Oenothera organensis*)

Species Description

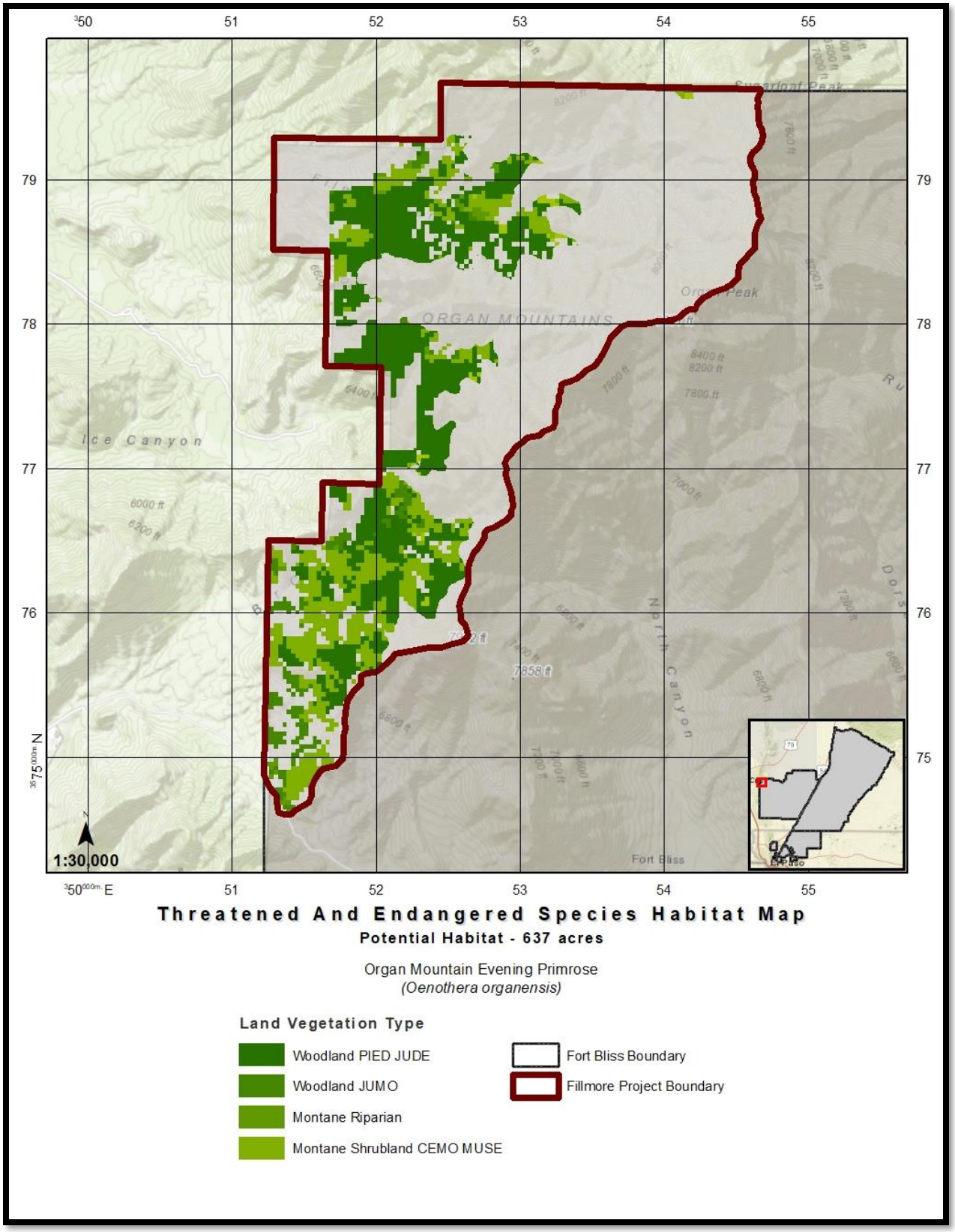
Organ Mountain evening primrose is a perennial, less than 50 cm high, with slender weak, decumbent branches; several stems from root, branched hirsute, the hairs rising from the papillae, also minutely, but sparingly cinereous; cauline leaves lanceolate or elliptic-lanceolate, 7 to 9 cm long, less than 25 mm wide, undulate, acute, cuneate at the base or rounded to a short winged petiole, sparingly repand-denticulate, finely appressed-pubescent, hirsute along the veins, the leaves of the inflorescence slightly reduced; flowers few; calyx tube 15 to 19 cm long, 2 mm thick; sparingly pilose; sepals 50 to 60 mm long, the subulate tips 5 mm long or more; pistil and stamens included; petals 50 to 55 mm long, deep yellow turning purplish; and capsules 30 to 44 mm long, columnar obtusely angled, sparingly hirsute (US Army 2010).

Habitat Requirements and Limiting Factors

Organ Mountain evening primrose is found at elevations between 4,860 and 7,800 ft above sea level throughout the Organ Mountains in southern New Mexico (DeBruin 1996). This plant is found only in streambeds or adjacent hillside seeps in canyon bottoms where surface water is present for at least part of the growing season. This primrose typically grows in open, sunny areas in riparian woods dominated by mountain mahogany, box elder, and willow (US Army 1994); however, specimens are found in sheltered areas along stream banks and ponds (US Army 2006). Soils in the area tend to be coarse wet sand with gravel; however, the plant has been found in all the substrates present in the Organ Mountain range (De Bruin 1996). Heavier rains sometimes remove soils from portions of longer roots, and new rosettes will often sprout from these exposed root sections.

Fort Bliss has confirmed observations of the Organ Mountain evening primrose, with most of these observations occurring within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded several observations within the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 637 acres (31%) of potential habitat within the project footprint (**Figure 3.4-3**).

Figure 3.4-3. Potential habitat assessment map for Organ Mountain Primrose



3.4.6 Organ Mountain Figwort (*Scrophularia laevis*)

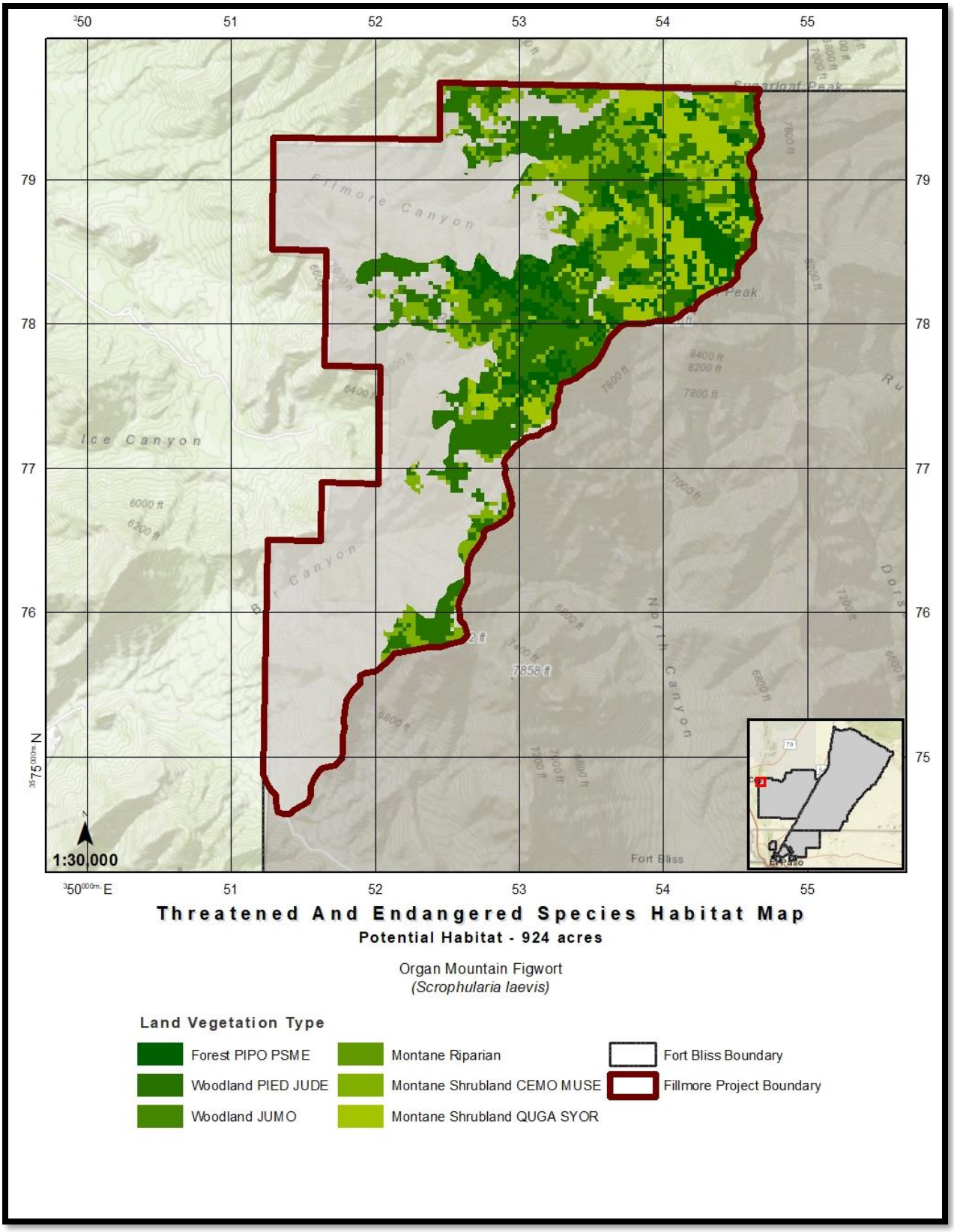
Species Description

The Organ Mountain Figwort (*Scrophularia laevis*) is a perennial herb, 4–10 cm; herbage light green, glabrate. Leaves: petiole length 1/3–1/2 blade; blade lanceolate to ovate, 5–7 cm, length 2–2.5 times width, base truncate, margins dentate. Pedicels slender, glabrate or stipitate-glandular. Flowers: corolla red to green, unicolored or ± bicolored, paler abaxially, 7–11 mm, throat open; staminode orbiculate, length equal to width.

Habitat Requirements and Limiting Factors
This species is endemic to the Organ Mountains and grows at higher elevations in dark organic soil in canyon bottoms in the oak woodland plant community. It can be found in moist canyons at elevations ranging from 2100 to 2600 m (6889 to 8530 ft).

Fort Bliss has confirmed observations of the Organ Mountain figwort, with most of these observations occurring within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded several observations within the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map indicates there are 924 acres (41%) of potential habitat within the project footprint (**Figure 3.4-4**).

Figure 3.4-4. Potential habitat assessment map for Organ Mountain Figwort



3.4.7 Organ Mountain Giant Hyssop (*Agastache pringlei var. verticillata*)

Species Description

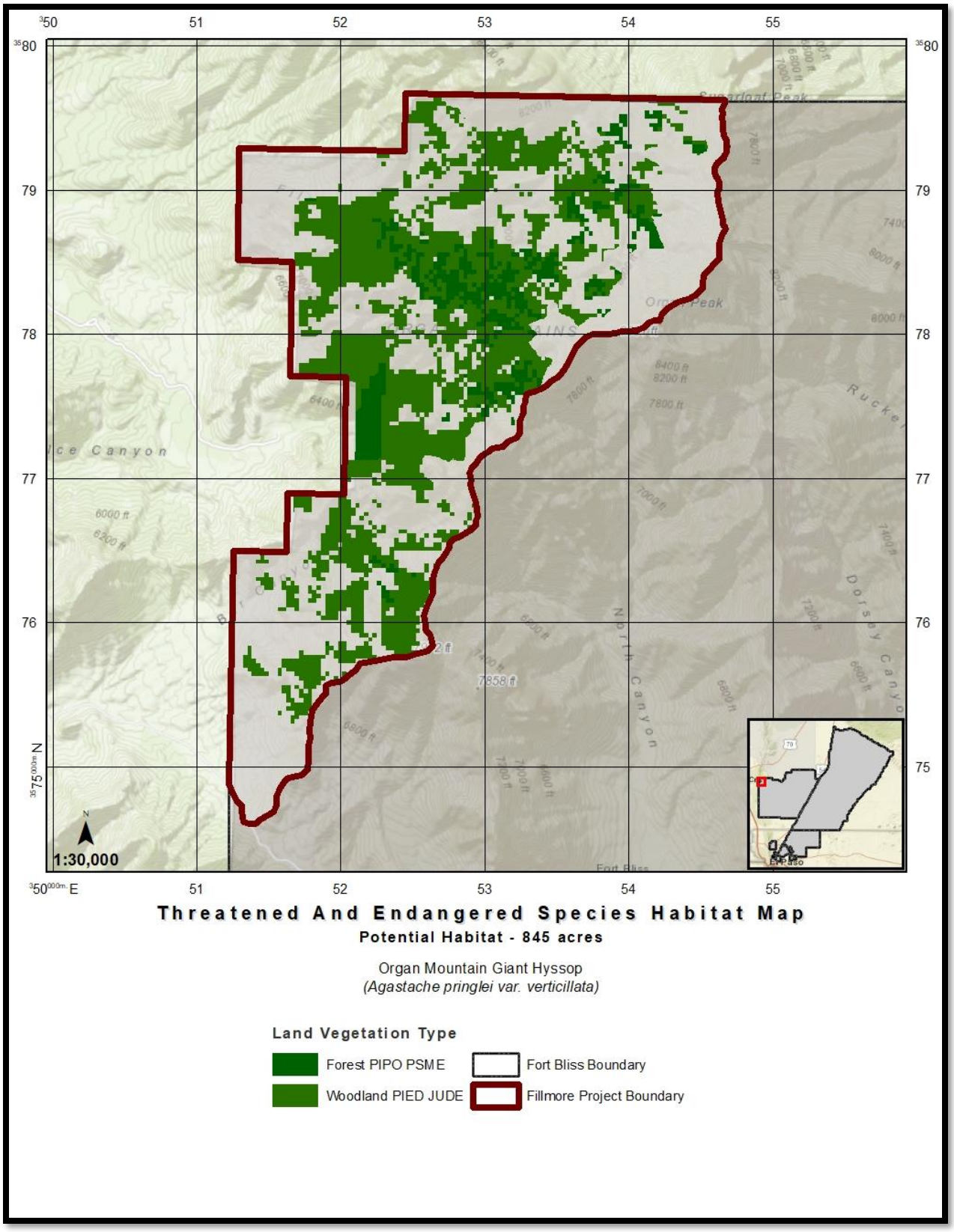
The Organ Mountain giant hyssop (*Agastache pringlei var verticillate*) is a profusely branched, erect perennial, woody only at the very base; stems 20 to 80 cm long; leaves are triangular ovate or triangular lanceolate. Stem and leaves are a dull to bright green above, paler below with thinly pubescent; flowers pink or dull rose-purple. They form whorls in interrupted spikes, zygomorphic five petals fused into a tube. This plant flowers from August to October (Wooton 1915).

Habitat Requirements and Limiting Factors

Found in the Organ Mountains, the Organ Mountain giant hyssop can be found in humus covered igneous talus and boulders at protected bases of steep cliffs in woodlands of Douglas fir, yellow pine and Gambel oak at elevations of 1,800 to 2,300 m (5,900 to 7,500 ft). This variety is a narrow endemic: Its habitat, while not rare in the Organ Mountains, is restricted but mostly lies away from human induced disturbance (NMRPTC 1999).

Fort Bliss NRDB was reviewed and only two observations for Organ Mountain giant hyssop were observed in September 1990 and August 1992. These observations occurred just inside project footprint by the Organ Peak. INaturalist observation database was also reviewed to confirm any observations near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map showed 845 acres (52%) potential habitat within the project footprint (**Figure 3.4-5**).

Figure 3.4-5. Potential habitat assessment map for Organ Mountain Giant Hyssop



3.4.8 Organ Mountain Indian Paintbrush (*Castilleja organorum*)

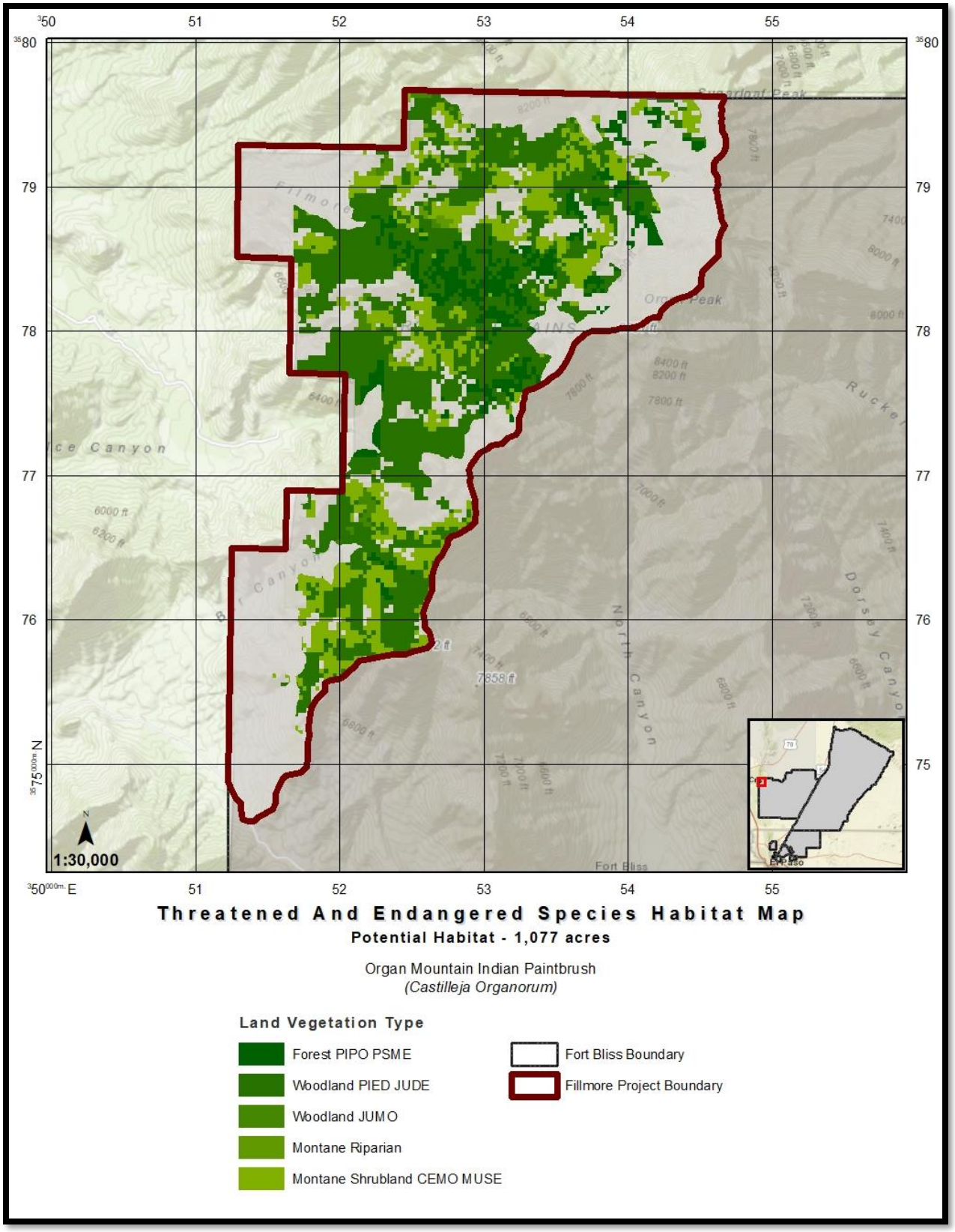
Species Description

The Organ Mountain Indian Paintbrush (*Castilleja organorum*) is a colorful perennial, multi-stemmed and branching herb or sub-shrub with stem hairs stiffly spreading or bent downward. Its leaves are narrow to linear-lanceolate, devoid of teeth and rough to the touch. Flowers are red-orange with pale-yellow at the base. It begins to flower from June through October (NMRPTC 1999).

Habitat Requirements and Limiting Factors
The Organ Mountain Indian Paintbrush can be found in open to partly shady montane slopes and rocky canyons in pinyon-juniper woodland or lower montane coniferous forest at elevations ranging from 2,000 to 2,400 m (7,000 to 8,000 ft). It is endemic to the higher elevations of the Organ Mountains (NMRPTC 1999).

Fort Bliss has several historical records of the Organ Mountain Indian Paintbrush dating from 1977 to 2011. Most observations occurred within project footprint throughout Fillmore Canyon and up to the Needles area. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded five observations within the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map showed 1,077 acres (79%) of potential habitat within the project footprint (**Figure 3.4-6**).

Figure 3.4-6. Potential habitat assessment map for Organ Mountain Indian Paintbrush



3.4.9 Organ Mountains Scaleseed (*Spermolepis organensis*)

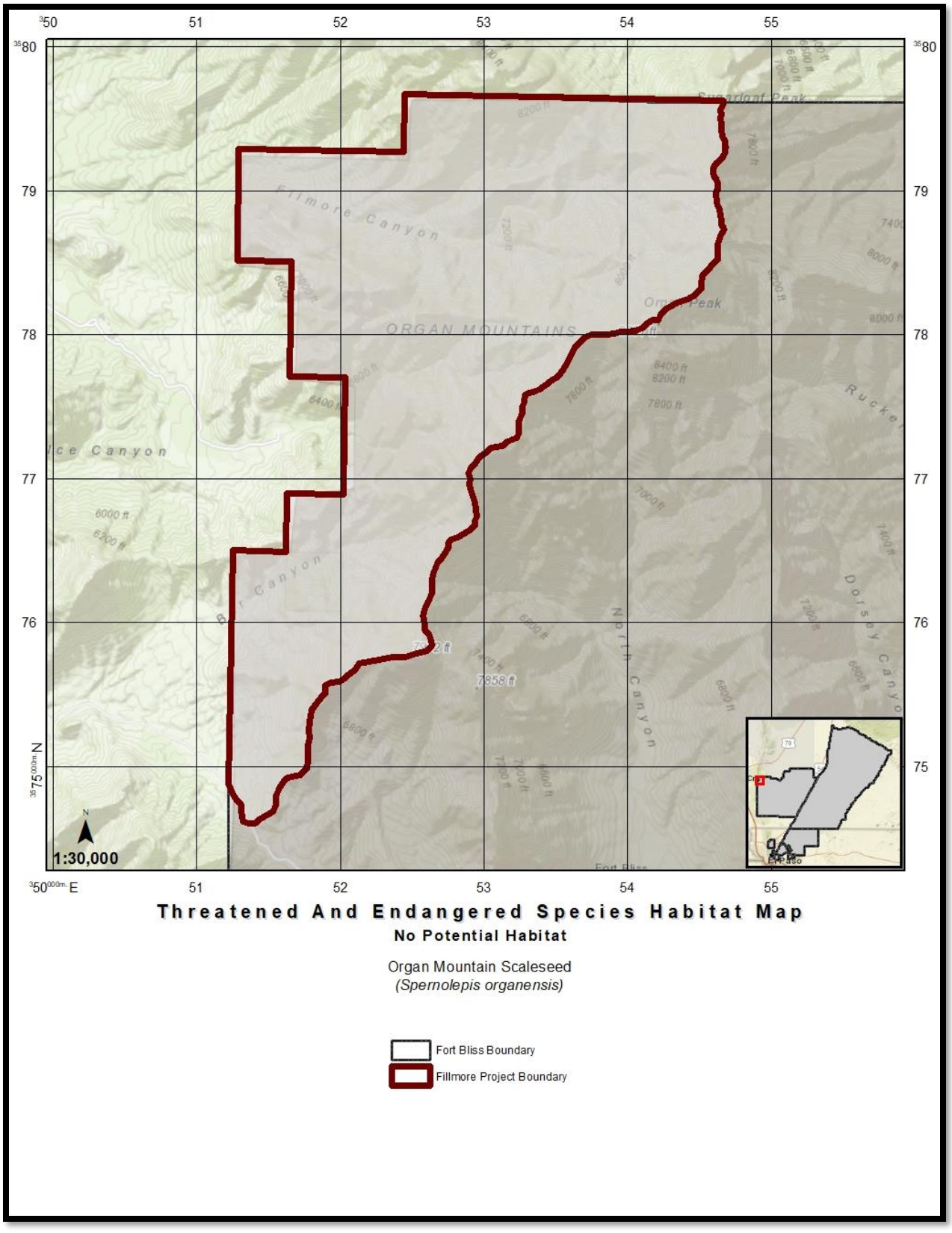
Species Description

The Organ Mountains Scaleseed (*Spermolepis organensis*) is an annual herb found on the northeastern bajada of the Organ Mountains, in New Mexico. Glabrous annual herb 10-20 cm high with a single stem branching distally or from near the base; leaves basal and cauline, alternate, twice- or thrice-ternately compound, ultimate divisions filiform, broadly ovate in outline, basal leaves usually withered by flowering; umbels terminal and axillary, pedunculate, compound, with four to seven rays bearing umbellets of three to six flowers; involucral bracts absent, involucel bractlets one to four, linear, 1-3 mm long; flowers perfect, minute, with white petals; schizocarps broadly ovoid, 1.2-1.5 mm long, with three somewhat indistinct, rounded dorsal ribs, lateral ribs similar to the dorsal, surface with irregular corky banding perpendicular to the ribs and a few scattered multicellular tubercles on the ribs, tubercles sometimes with a straight, hair-like point. Flowering late March to early May (Nesom 2012).

Habitat Requirements and Limiting Factors
This species was found in quartz monzonite derived sandy and gravelly soils at elevations of 1400 to 1650 m (4600 to 5400 ft). The original specimen was found "at the lower edge of Madrean chaparral, with oak (*Quercus* spp.*),* juniper *(Juniperus* spp.*),* mahogany (*Cercocarpus* spp.*),* silk tassel (*Garrya* spp.*),* and sumac (*Rhus* spp.*)*. Plants found in the spring of 2016 were found in shrub savannah associated with *Prosopis glandulosa* and *Eragrostis lehmanniana*."

Fort Bliss has no observations of the Organ Mountain Scaleseed anywhere in its territory. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded two observations located on the northeastern side of the Organ Mountains closer to White Sands Missile Range (WSMR). Based on the habitat requirements needed to support this species, the habitat assessment indicated there is no potential habitat within the project footprint (**Figure 3.4-7**).

Figure 3.4-7. Potential habitat assessment map for Organ Mountain Scaleseed



3.4.10 Organ Mountain Foxtail Cactus (*Coryphantha organensis*)

Species Description

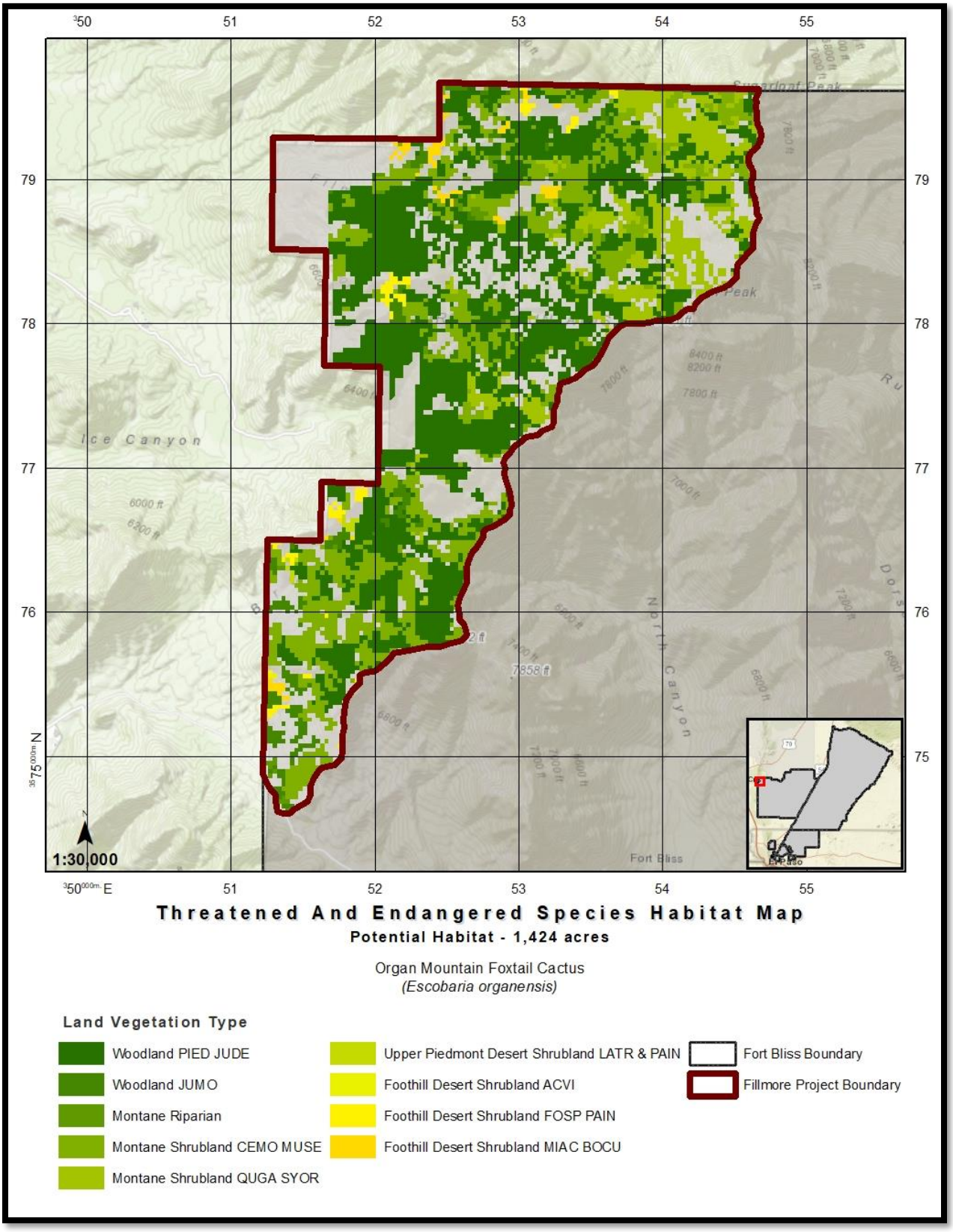
The Organ Mountain Foxtail Cactus (*Coryphantha organensis*) is a small cactus with solitary stems that grows in clumps or commonly branched out to form small dense clusters. The individual stems are mostly 2 to 4 cm thick and up to 15 cm long. Its spines are yellowish cast often reddish-brown at the tips. Its pale yellowish to pinkish almost nearly white flowers do not open widely. Flowers are produced from April to May. The foxtail cactus produces fruits that are green to somewhat reddish (NMRPTC 1999).

Habitat Requirements and Limiting Factors

The Organ Mountain Foxtail Cactus can be found in the northern Franklin and Organ Mountains, similar to Sneed's pincushion cactus**.** It can be found on andesite, quartz-monzonite, and to a lesser extent rhyolite and limestone in broken mountainous terrain. Associated mostly with Chihuahuan Desert scrub and open oak and pinyon-juniper woodland; 1,350-2,600 m (4,400-8,530 ft; NMRPTC 1999).

Fort Bliss has several historical records of the Organ Mountain Foxtail cactus, dating from 1966 to 2011 most observations occurred within project footprint throughout Fillmore Canyon and up to the Needles area. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded several observations within the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map showed 1,424 acres (88%) of potential habitat within the project footprint (**Figure 3.4-8**).

Figure 3.4-8. Potential habitat assessment map for Organ Mountain Foxtail Cactus



3.4.11 Roetter's Hedgehog Cactus (*Echinocereus x rotteri)*

Species Description

The Roetter's Hedgehog Cactus (*Echinocereus x rotteri; syn Echinocereus lloydii*) is now known to be a natural hybrid between the Texas rainbow (*Echinocereus dascyacanathus*) and the claret cup (*E. triglochidiatus*). This is a small, single or branched cactus with up to 20 (or more) stems and well furnished with greyish pink to brown spines and whitish wool that flowers in many colors.

Habitat Requirements and Limiting Factors

This cactus occurs in thin gravelly calcareous soil over rocky limestone outcrop of low foothill ridge on the eastern edge of the Jarilla Mountains. It can be found scattered through in Chihuahuan Desert scrub at elevations of 1310 m (4300 ft) where both of its parent plants can be found growing together.

Fort Bliss has no observations of the Organ Mountain Scaleseed anywhere in its territory. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations in the region. Based on the habitat requirements needed to support this species, the habitat assessment indicated there is no potential habitat within the project footprint.

3.4.12 Sand Prickly pear (*Opuntia arenaria*)

Species Description

The sand prickly pear (*Opuntia arenaria*) is a cholla-type cactus that typically stand less than 1 ft high but can form clumps up to 5 ft in diameter. The sand prickly pear spread out in cactus mats of 1-3 m in diameter, often branches are buried by shifting soil and these have been interpreted by some to be rhizomes. Pads are small and narrow ranging from 4 to 7 cm long and 2 to 3 cm wide. It produces spins in all but the lowermost areoles. Produces yellow flowers and the filaments are white or pale tinged with pink, with fruits being reddish when first produced and turning tan and dry at maturity (Powell and Weedin 1856).

Habitat Requirements and Limiting Factors

The Sand Prickly pear (*Opuntia arenaria)* is a small prickly pear cactus that occurs in sandy or silty soils where they, often with honey mesquite and a sparse cover of grasses at elevations of 1,160-1,300 m (3,800-4,300 ft). This species inhabits semi-stabilized sand dunes among open Chihuahuan Desert scrub in adjacent areas of New Mexico, Texas, and Chihuahua, Mexico (Ferguson 1998).

Fort Bliss has confirmed observations of the Sand prickly pear, however none of these observations were located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

3.4.13 Sneed's Pincushion Cactus (*Coryphantha sneedii* var. *sneedii*)

Species Description

Sneed's pincushion cactus (*Coryphantha sneedii var. sneedii*) is a small, multi-stemmed succulent that prefers steep dolomite outcrops. Three clumps were first discovered by J.R. Sneed near El Paso in the early 1920s (Britton and Rose 1963). This species forms tight clumps of up to 100 or more stems. Individual stems are cylindroid or spherical to club shaped measuring 2.5 to 7.5 cm (1 to 2.9 in) and 1 to 3 cm (0.4 to 1.2 in) with tubercles up to 3 mm in length (0.12 in). Flowers are brownish pink to pale rose with pink filaments and bright orange anthers. The fruit is greyish-green or greenish tinged with brown, or rarely pinkish when ripe (Benson 1982).

Habitat Requirements and Limiting Factors
This cactus grows at elevations of 3,900 to 7,700 ft on vertical cliffs or ledges made of limestone in Chihuahuan Desert scrub. Populations in the northern Franklin Mountains and southern Organ Mountains are restricted to Paleozoic Fusselman dolomite formations from the Silurian Age. Common plant communities associated with the cactus include creosote (*Larrea tridentata*), Torrey yucca (*Yucca torreyi*), gramma grasses (*Bouteloua spp*.), sotol (*Dasylirion wheeleri*), ocotillo (*Foquieria spledens*), and lechugilla (*Agave lechugilla*). Several other cactus species may also be found within the range of Sneed's pincushion cactus (Ferguson 1998).

Fort Bliss has confirmed populations of Sneed's pincushion cactus, however none of these observations were located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment maps indicated there is no potential habitat within the project footprint.

3.4.14 Standley's Whitlowgrass (*Draba standleyi*)

Species Description

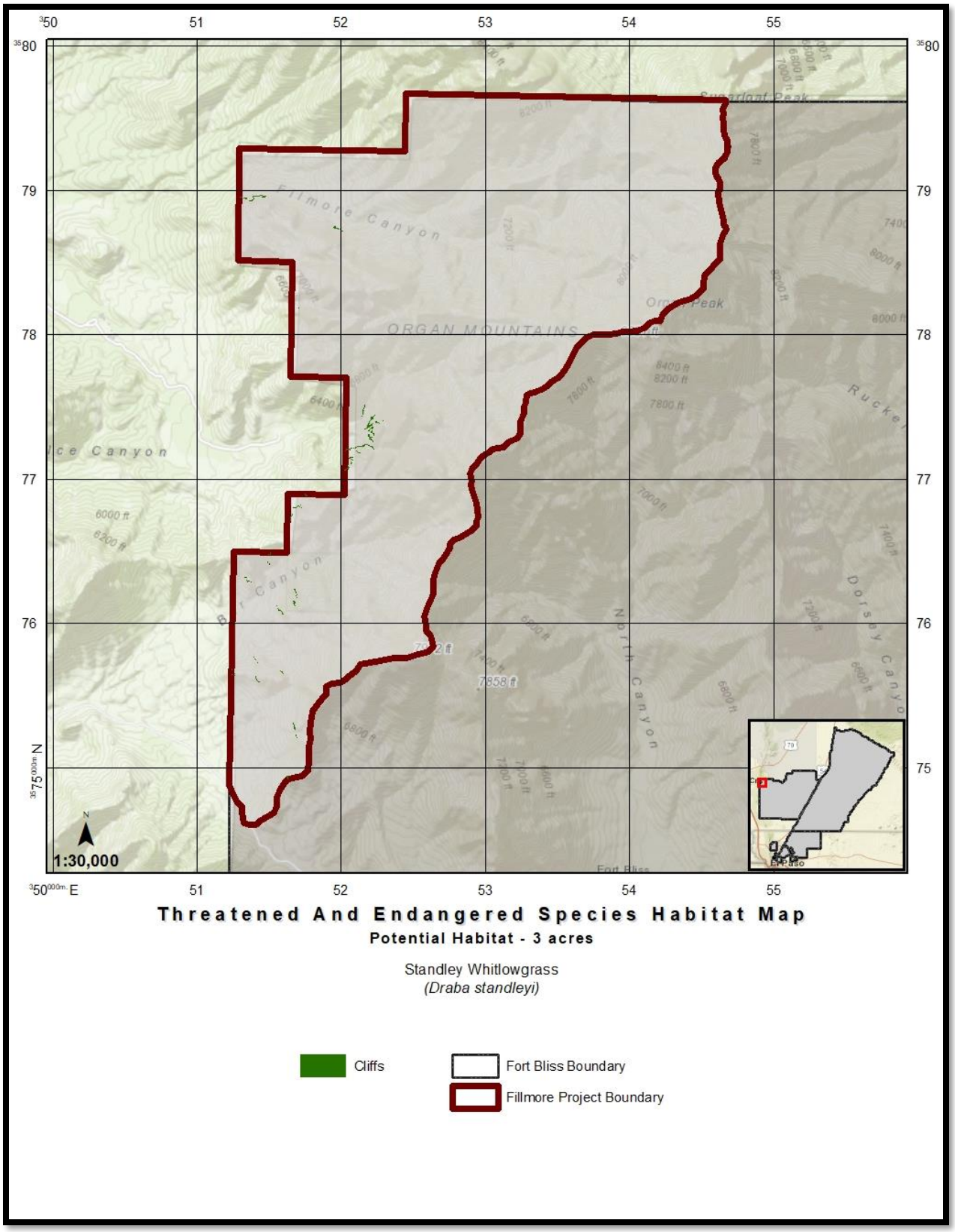
The Standley's whitlowgrass (*Draba standleyi*) is a "tufted perennial; caudex simple or closely branched, thick with marcescent (withered but persistent) leaf bases; stems few, 1-3 cm long, very slender, erect to partially decumbent, simple or few-branched, sparsely pubescent below with simple or forked trichomes, glabrous above or glabrous throughout; basal leaves narrowly oblanceolate, long-petioled, entire or remotely denticulate, pubescent to merely ciliate with stiff appressed hairs or glabrous, 1.5-8 cm long, stem leaves one to eight, small, remote, sessile but not auriculate, few-toothed or entire; inflorescences much elongated, five- to 20-flowered; petals four, yellow; fruiting pedicels erect to divaricately ascending, 8-13 mm long; siliques linear-elliptic to oblong, glabrous or nearly so, flat or contorted, 8-12 mm long; styles 1-2 mm long. Flowers June to August (Bleakly 1999).

Habitat Requirements and Limiting Factors
Standley's whitlowgrass is sporadically distributed in the mountains of southwestern United States. It is known from the Chiricahua Mountains in Arizona, the Organ Mountains and Black Range in New Mexico, and the Davis Mountains in Texas. It occurs on igneous rock faces, bases of overhanging cliffs, and clefts of porphyric and andesitic rocks and soil at 1,675-1,980 m (5,500-6,500 ft) (Macbr 1997).

Fort Bliss has confirmed observations of the Standley's whitlowgrass located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded only one observation. Based on the habitat requirements

needed to support this species, the habitat assessment map indicated there are only 3 acres (0.001%) of potential habitat within the project footprint (**Figure 3.4-9**)

Figure 3.4-9. Potential habitat assessment map for Standley's whitlowgrass



3.5 Invertebrates

3.5.1 Beasley Woodland snail (*Ashmunella beasleyi*)

Species Description

Beasley Woodland snail (*Ashmunella beasleyi*) is a small air-breathing land snail endemic to the Organ Mountains. This group of snails poorly understood. As a result of rifting and fault blocking associated with the Rio Grande Rift, land snails in the genus *Ashmunella* are geographically isolated in disjunct mountain ranges. Land snails play a key role in nutrient cycling in their habitats (Kroll et al. 2003).

Habitat Requirements and Limiting Factors

Endemic to the Organ Mountains, Beasley Woodland snails are usually restricted to accumulations of rock talus. Land snails in the *Ashmunella* genus, have numerous microhabitat requirements and are particularly susceptible to environmental fluctuations and habitat disturbances. *Ashumnella* has been found in vegetation communities dominated by mountain mahogany (*Cerocarpus breviflorus*), interior chaparral (*Quercus spp*.), and ponderosa pine (Kroll et al. 2003).

Fort Bliss has historical records for the Beasley Woodland snail occurring outside of the project footprint in Granite Peak. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map showed no potential habitat within the project footprint.

3.5.2 Boulder Canyon Woodlandsnail (*Ashmunella auriculata*)

Species Description

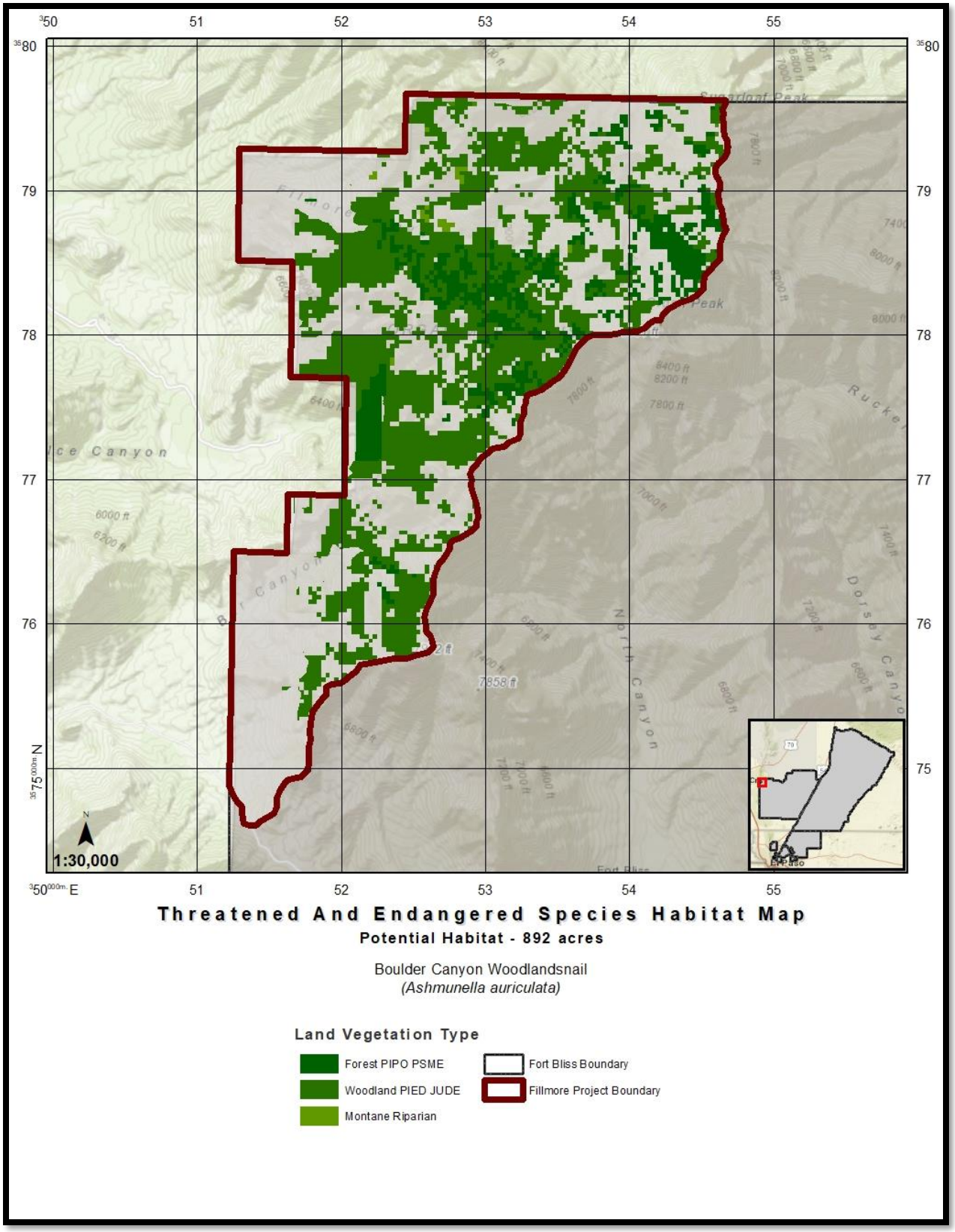
Woodland snails in the genus *Ashmunella* eat plant materials that are living, decaying, and dead, and will avoid foraging in the midday heat. They are active in the early morning, evenings, and particularly after rain.

Habitat Requirements and Limiting Factors

Woodland snails in the genus *Ashmunella* typically inhabit spaces among accumulations of rock talus and prefer moist soils with decaying litter from deciduous trees around the perimeter of the talus slope. The snails eat plant materials that are living, decaying, and dead, and will avoid foraging in the midday heat. They are active in the early morning, evenings, and particularly after rain. It occurs only in the northwest portion of the mountains range and populations seem to be limited to lower Fillmore Canyon, Indian Hollow Canyon and around the “Rabbit Ears.” This species is not known to occur south of the Fillmore Canyon or east of the Fillmore Canyon “Narrow” (Metcalf and Smartt 1997).

Fort Bliss has historical records for the Boulder Canyon Woodlandsnail occurring within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map showed 892 acres of potential habitat within the project footprint (**Figure 3.5-1**).

Figure 3.5-1. Potential habitat assessment map for Boulder Canyon Woodlandsnail



3.5.3 Franklin Mountain Talussnail (*Sonorella metcalfi*)

Species Description

The talussnail is a rock snail usually found in taluses or "slides" of coarse, broken rock. The snails are generally found in crevices one to several feet below the surface, sealed to stones by their mucus. The shell is usually thin and globular. The shells of *Sonorella* are weakly differentiated, and species are usually separated by location and male genitalia. The shell of the talussnail averages over half an inch tall and almost an inch wide. *Sonorella* are distributed from Arizona, southern New Mexico, western Texas, and southward into northwestern Chihuahua and northeastern Sonora. They can be found from arid, lower elevation foothills to wooded canyons at elevations of 8,000 to 10,000 feet (Pilsbry 1939). Talussnail generally have a very narrow range and are usually restricted to a particular mountain range. Destruction or disturbance of talus slopes may lead to the extinction of a talussnail species.

The Arizona Game and Fish Department (2008) provide the following description of *Sonorella* species:

Snails in the genus Sonorella have a “depressed globose, helicoids shell, 12 to 30 mm in diameter, umbilicate or perforate, with a wide, unobstructed mouth and a thin, barely expanded peristome, smoothish or slightly sculptured with growth-lines, occasionally with fine oblique or spiral granulation and short hairs (mainly on the early whorls), lightly colored, and normally with a dark peripheral band. Its most characteristic features are, however, in the genitalia, which lack a dart sac and mucus glands (Bequaert and Miller 1973). The penis is a usually long, slender, narrowly pointed verge; and in extreme forms, the verge is thick and club-shaped. Shells are relatively large and capacious, with a smooth, silky-lustrous periostracum; usually with apical spirally descending threads (Bequaert and Miller).”

Habitat Requirements and Limiting Factors

Fort Bliss has confirmed observations of the Franklin Mountain Talussnail located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded only two observations both were outside of the project footprint. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

3.5.4 Maple Canyon Talussnail (*Sonorella todseni*)

Habitat Requirements and Limiting Factors

The Maple Canyon Talussnail is the most restricted, distributionally of the New Mexico *Sonorella*. This snail can be found in an area of igneous rock talus under sparse growth of live oaks and xeric-adapted shrubs (Metcalf and Smartt 1997).

Fort Bliss has confirmed observations of the Maple Canyon Talussnail, however they are not located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat

requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

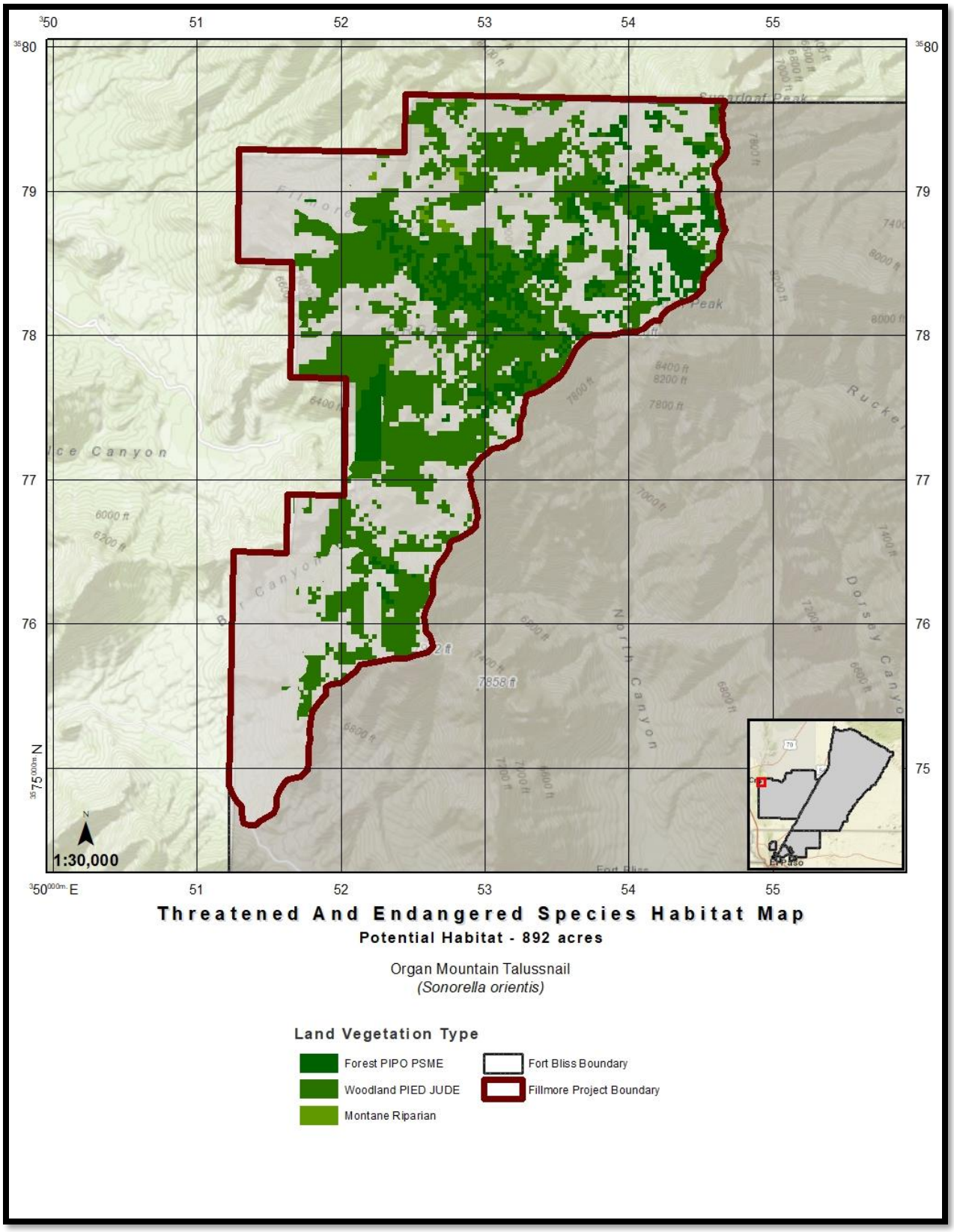
3.5.5 Organ Mountain Talussnail (*Sonorella orientis*)

Habitat Requirements and Limiting Factors

This snail is associated with a various kinds of igneous rock talus, chiefly rhyolitic and monzonite in elevations ranging from 4,900 to 7,900 ft (Metcalf 1984). Organ Mountain talussnail habitat preference seems to depend on the various interrelated factors including elevation, distribution of forest, topography, in canyons or exposed slopes direction of slope exposure, and nature of bedrock play a role in habitat preference.

Fort Bliss has historical records for the Organ Mountain Talussnail occurring within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map showed 892 acres of potential habitat within the project footprint (**Figure 3.5-2**).

Figure 3.5-2. Potential habitat assessment map for Organ Mountain Talussnail



3.5.6 Organ Mountain Woodland Snail (*Ashmunella organensis*)

Species Description

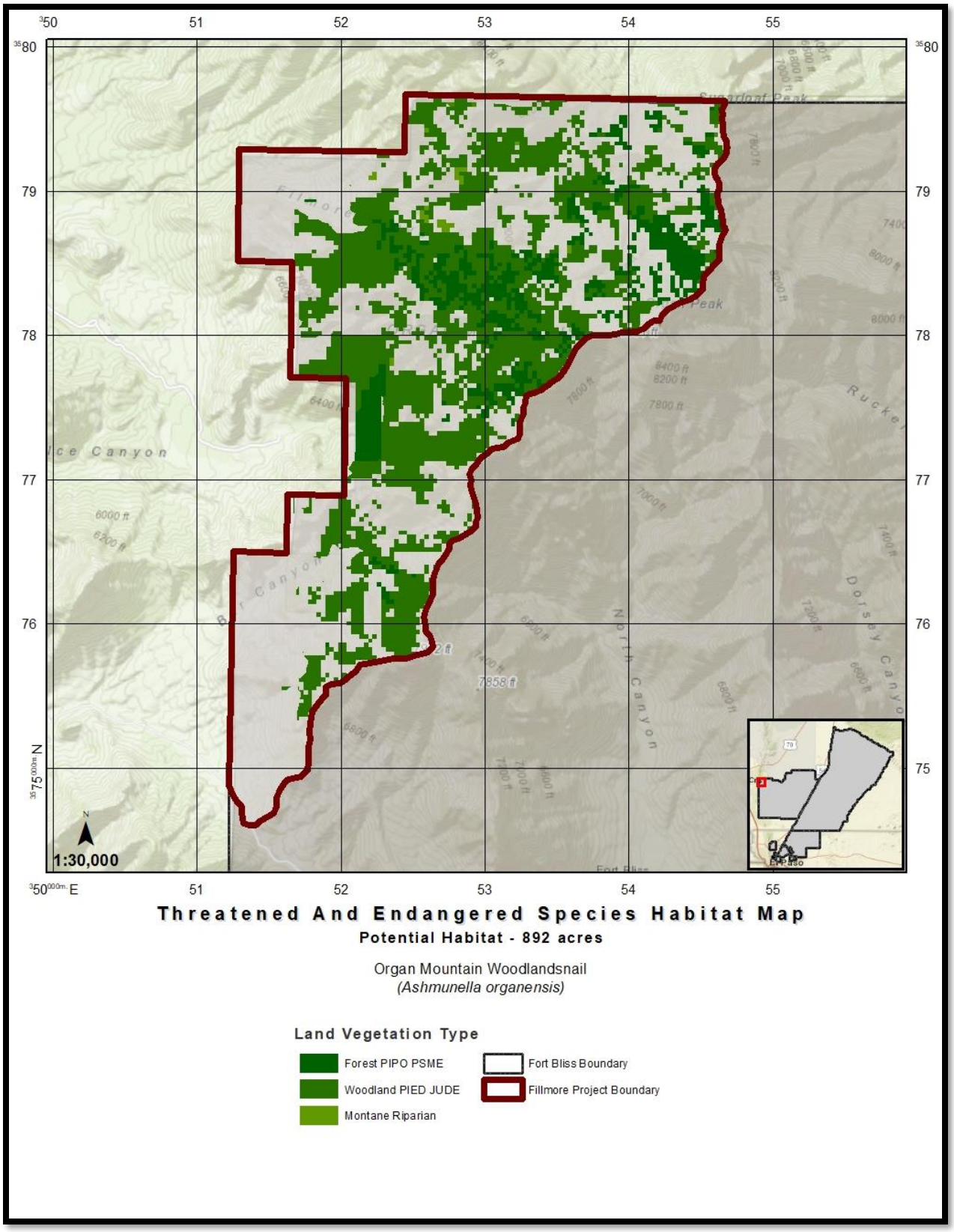
The Organ Mountain Woodland Snail (*Ashmunella organensis*) is variable in size, shape, thickness of shell and in coloration. These characters seem intergradation among populations and related to elevations. These snails vary in the presence of teeth, with some missing and other specimens having several teeth. Shells of specimens from lower elevations were markedly thinner than those from higher elevations (Metcalf 1984). It is the most widespread of the four Organ species.

Habitat Requirements and Limiting Factors

Organ Mountain Woodland snails can be found in steep talus slopes at elevations of 2,400 or over in the Organ Mountains. They prefer habitats with western aspect that consists of medium to large lichen covered boulders surrounded by mountain mahogany (*Cercocarpus breviflorus*), Gambel Oak (*Quercus gambelii*), and New Mexico locust (*Robinia neomexicana*) (Hobert 2008). Ashmunella typically inhabit spaces among accumulations of rock talus and prefer moist soils with decaying litter from deciduous trees around the perimeter of the talus slope. The snails eat plant materials that are living, decaying, and dead, and will avoid foraging in the midday heat. They are active in the early morning, evenings, and particularly after rain.

Fort Bliss has confirmed observations of this woodland snail located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded only one observation. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 892 acres of potential habitat within the project footprint (**Figure 3.5-3**)

Figure 3.5-3. Potential habitat assessment map for Organ Mountain Woodlandsnail



3.6 Mammals

3.6.1 Arizona black-tailed Prairie Dog (*Cynomys ludovicianus arizonensis*)

Species Description

The Arizona black-tailed Prairie Dog (*Cynomys ludovicianus arizonensis*) is the Trans-Pecos subspecies of *C. ludovicianus*. Black-tailed prairie dogs are large, robust, ground-dwelling squirrels; their general coloration is brownish to brownish red dorsally, whitish fur on the belly, and a short, sparsely haired tail tipped in black.

Habitat Requirements and Limiting Factors
Prairie dogs are native to short-grass prairie habitats of western North America, avoiding the reduced visibility of heavy brush and tall grass areas. They inhabit shortgrass prairie, mixed-grass prairie, sagebrush steppe, and desert grassland; overgrazed or denuded pastureland also provides good habitat for prairie dogs.

Fort Bliss has confirmed observations of the Arizona black-tailed prairie dog; however, none of these observations were located within the project footprint. All observations were made in the grasslands of the Otero Mesa and sub-mesa. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

3.6.2 The Desert Bighorn Sheep (*Ovis canadensis mexicana*)

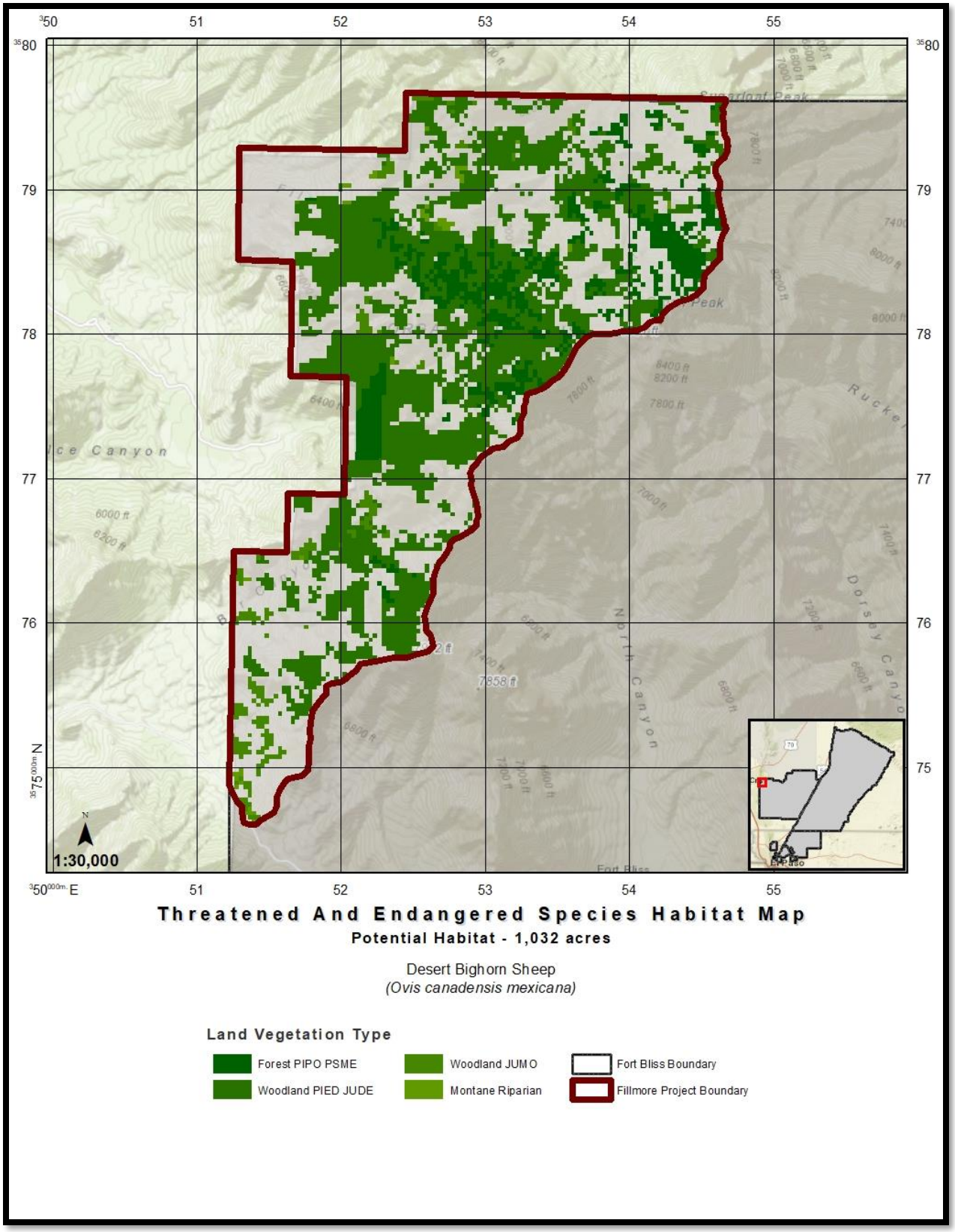
Species Description

The Mexican Desert Bighorn Sheep (*Ovis canadensis mexicana*) stands 30-39 inches at the shoulder. Rams are crowned with a large set of horns, in contrast to the much smaller horns of ewes, adolescent males and lambs. Their coats are buff brown, but the color can vary from pale cream to dark chocolate and the characteristic white patch on the rump (NMDGF 2015).

Habitat Requirements and Limiting Factors
Mexican bighorn sheep require open country with mountains or canyons that provide escape; they inhabit terrain with steep cliffs with 60 percent or greater slopes that consist of low, arid plains separated by barren, often detached mountains. They inhabit areas that range in elevation from sea level to 5,000 ft. Desert bighorn are usually found within a mile of water, during hotter weather they will be closer (NMDGF 2015).

Fort Bliss has no observation records within the project footprint, however, there is one observation record just south of the project boundary in lower tank, this is a record from 1956. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. It must be noted that negative findings do not indicate this species does not occur within the footprint, only that, currently, there are no confirmed records. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 1,032 acres of potential habitat within the project footprint (**Figure 3.6.1**).

Figure 3.6-1. Potential habitat assessment map for Desert Bighorn Sheep



3.6.3 Gray-footed Chipmunk (*Neotamias canipes sacramentosis*)

Species Description

The Gray-footed chipmunk (*Neotamias canipes sacramentosis*) is a small grayish squirrel with upperparts marked with four whitish and three to five brownish stripes; the nape and shoulders usually with distinct wash of smoke gray; dark dorsal stripes black or brownish black; inner pair of light stripes smoke gray, outer pair grayish white (Schmidly 2016).

Habitat Requirements and Limiting Factors

The Gray-footed chipmunk prefers habitats that include coniferous forests, dense mixed oak, pine, and fir forests and pinyon-juniper woodland and brushy hillsides with rocky crevices. These chipmunks climb and perch on logs, rocks, cliffs, and woody plants. They occur in higher-elevation forests and brushy hillsides (Shmidly 2001).

Fort Bliss has no observation records within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there is no potential habitat within the project footprint.

3.6.4 Mexican Gray Wolf (*Canis lupus baileyi)*

Species Description

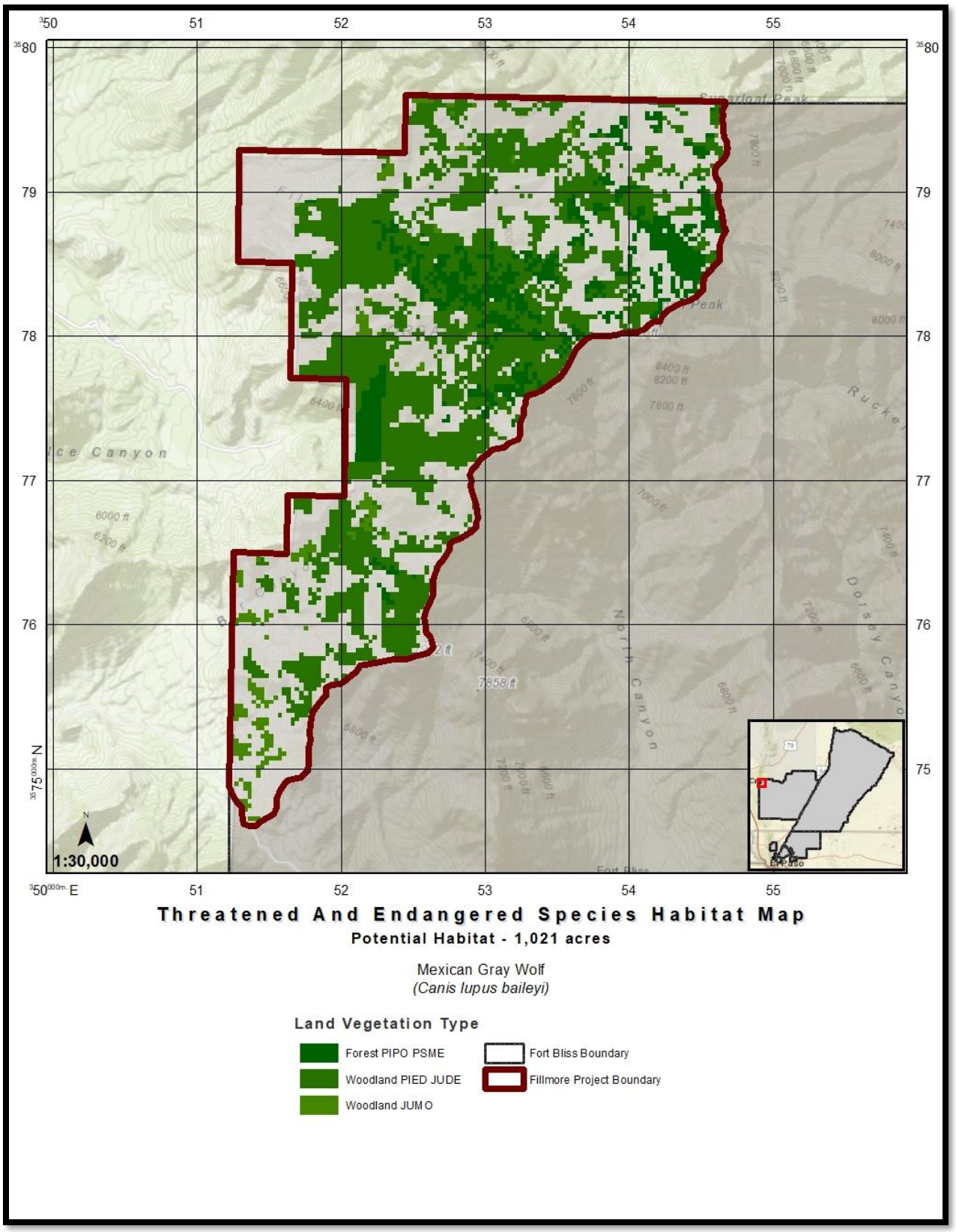
The Mexican gray wolf is a top predator that is native to the southwestern United States and Mexico. They are canines with long bushy tails that often have a black tip. Their coat is typically a mix of gray and brown with facial markings and undersides, but the color can vary from solid white to brown or black. Wolves vary in size depending on where they live. The Mexican gray wolf is the smallest subspecies of gray wolves (Hall and Kelson 1959).

Habitat Requirements and Limiting Factors

Historically, the range of the Mexican gray wolf extended from southern Arizona and New Mexico down to central Mexico. The large social structure of wolf packs requires large amounts of forested terrain with adequate deer and elk populations to support the pack. Wolves can thrive in a diversity of habitats from tundra to woodlands, forests, grasslands, and deserts (Merkle et al. 2009).

Fort Bliss has no observation records within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. It must be noted that negative findings do not indicate this species does not occur within the footprint, only that, currently, there are no confirmed records. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 1,021 acres of potential habitat within the project footprint (**Figure 3.6.2**).

Figure 3.6-2. Potential habitat assessment map for Mexican Gray Wolf



3.6.5 Organ Mountain Colorado Chipmunk (*Neotamias quadrivittatus australis*)

Species Description

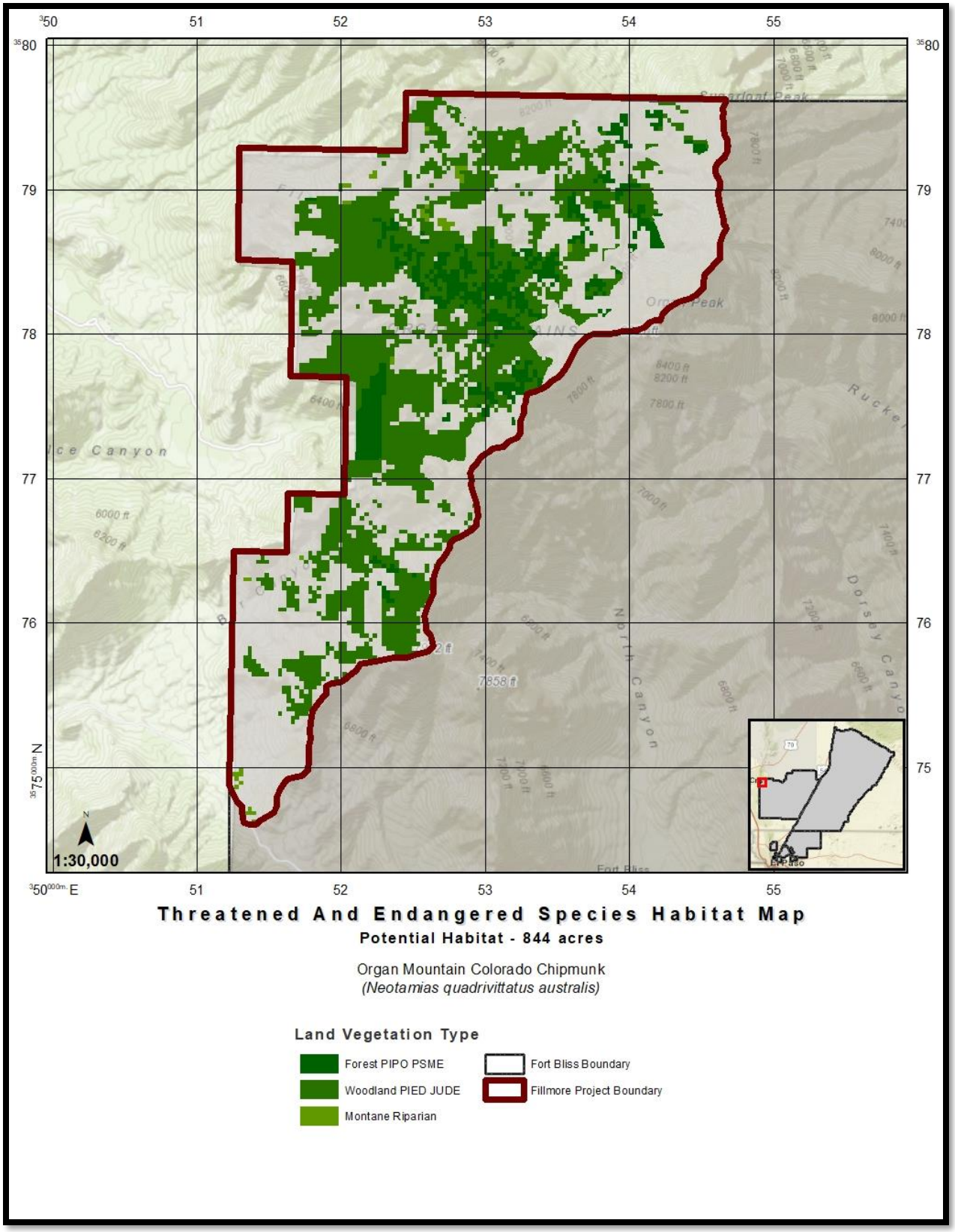
The Organ Mountain Colorado Chipmunk (*Neotamias quadrivittatus australis*) is a medium-sized chipmunk with mostly orange pelt; the head is cinnamon colored, with shades of gray with white color on the belly, and yellowish-brown on the sides. These chipmunks have three median stripes on their backs, which are black with yellowish-orange margins, and have outer stripes that are brown; their shoulders are gray, the thighs and rump are cinnamon. The tail of this chipmunk has a black tip, is white-bordered, and tawny underneath; the ears are blackish in front, whitish in the back (Rivieccio 2003).

Habitat Requirements and Limiting Factors

The Organ Mountain Colorado Chipmunk is endemic to the Organ Mountains of New Mexico, with its range centered on the Aguirre Springs Basin; it is limited to pinyon-juniper woodland at the upper elevations (Hamilton 2004, Smith 2017). This chipmunk is considered vulnerable due to its geographic isolation and confinement to mesic, higher-elevation habitats. It is theorized that these chipmunks are shifting their habitat preference in response to climate change impacts by selecting deep arroyos as habitat (Schweiger and Frey 2021).

Fort Bliss has confirmed observations of the Organ Mountain Colorado chipmunk within the project boundary. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded multiple observations in and around the project boundary. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 844 acres of potential habitat within the project footprint (**Figure 3.6-3**)

Figure 3.6-3. Potential habitat assessment map for Organ Mountain Colorado Chipmunk



3.6.6 Spotted Bat (*Euderma maculatum*)

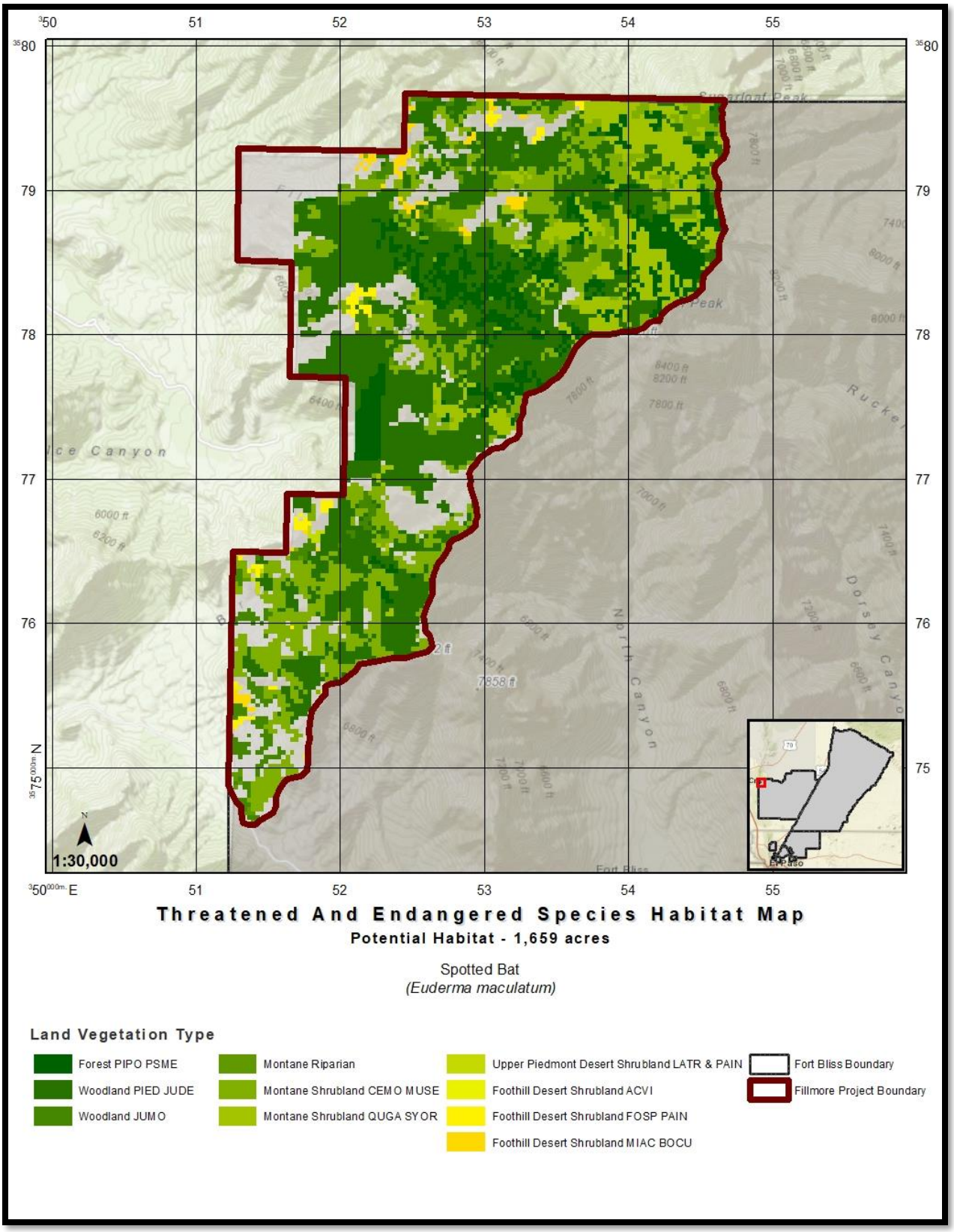
Species Description

The Spotted Bat (*Euderma maculatum*) is distinguished from all other North American bats by its distinctive coloration. It has large white spots on its shoulders and rump that accentuate its long fur, which is bright white beneath and black above. It has translucent pink ears and wings, and its ears are the largest of any bat in the U.S., with a length as long as its body (BCI 2021).

Habitat Requirements and Limiting Factors
The distribution of the spotted bat is broad and patchy, highly associated with prominent rock features. It has been found in high elevation forests to low desert habitats. It is known from semiarid regions of the western United States and Northern Mexico. It prefers to roost in cliff crevices away from human activity and any disturbance. Its habitat preferences limit it to a very small geographic areas with very specific geologic features. Foraging occurs in forest openings, pinyon juniper woodlands, large riverine and riparian habitats associated with small to mid-sized streams in narrow canyons, wetlands, meadows and old agricultural fields (Balcombe 1988).

Fort Bliss has no observation records within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. It must be noted that negative findings do not indicate this species does not occur within the footprint, only that, currently, there are no confirmed records. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 1659 acres of potential habitat within the project footprint (**Figure 3.6.4**).

Figure 3.6-4. Potential habitat assessment map for Spotted Bat



3.6.7 Townsend's Big-eared Bat (*Corynorhinus townsendii*)

Species Description

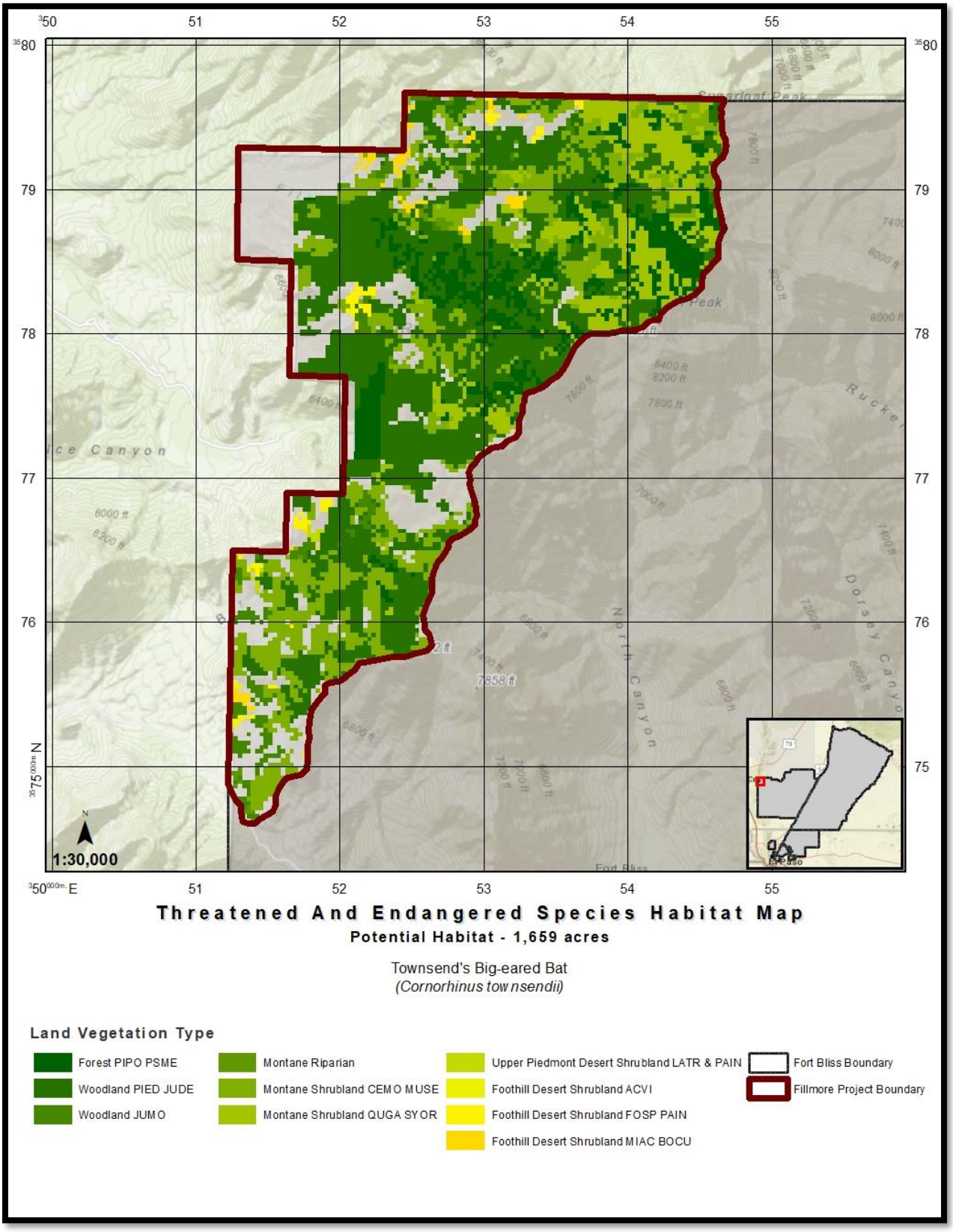
The Townsend's Big-eared bat (*Corynorhinus townsendii*) is a medium sized bat known for the unique habit of forming maternity roosts during breeding season. An insectivorous bat has exceptionally large ears, and large and wide wings that allow them to fly at low speeds, hover, and maneuver in cluttered environments. This species of bat depends on caves, abandoned mines, and other subterranean features for reproduction and hibernation, but prefers to roost in open areas (Pierson 1998).

Habitat Requirements and Limiting Factors

The Townsend's Big-eared Bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific coast to central Mexico. Big-eared bats have been found in a variety of habitat types, ranging from sea level to 3,300 m. It is most typically found in arid western desert scrub and pine forest regions. Its habitat associations include coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat type. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat (Pierson 1998).

Fort Bliss has confirmed observations of the Townsend's Big-eared Bat, however, none of these observations were located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observations. It must be noted that negative findings do not indicate this species does not occur within the footprint, only that, currently, there are no confirmed records. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 1,659 acres of potential habitat within the project footprint (**Figure 3.6.5**).

Figure 3.6-5. Potential habitat assessment map for Townsend's Big-eared bat.



3.7 Reptiles

3.7.1 Gray-banded Kingsnake (*Lampropeltis alterna*)

Species Description

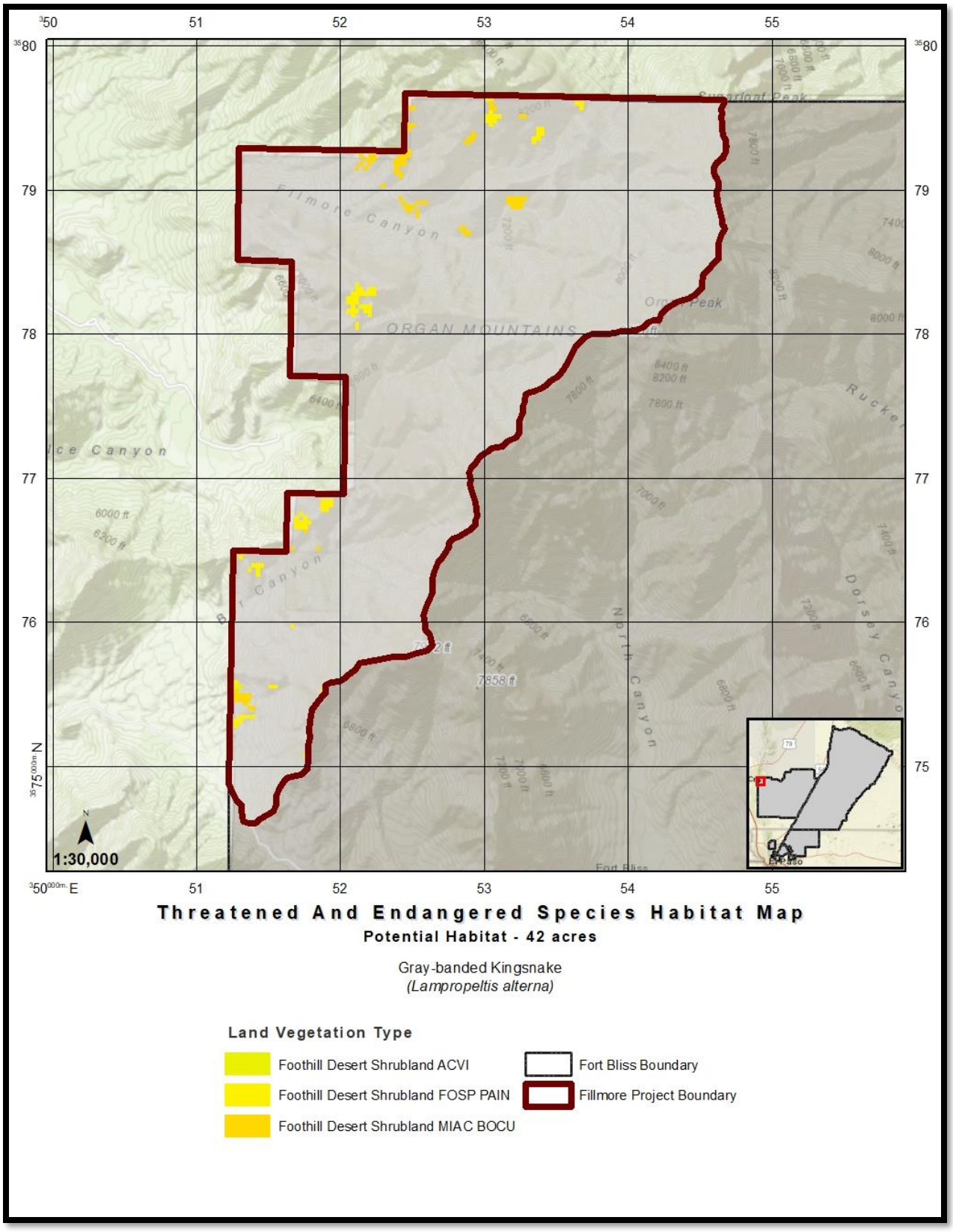
The Gray-banded Kingsnake (*Lampropeltis alterna*) coloration and pattern vary, but there are two main color morphs with different locales: *L. a. alterna*, and *L. a. blairi*. Both can have red/orange banding on a gray background with white and/or black accenting, but *blairi* banding is wider (Gehlbach and Baker 1962). This snake is usually about 91 cm (3 ft) in length. It is a well-adapted desert dweller; in times of drought or extreme heat it can retreat underground to prevent dehydration. This snake usually lays four to 14 eggs (Contant 1975).

Habitat Requirements and Limiting Factors

This kingsnake is an endemic Chihuahuan Desert Taxon. The gray banded kingsnake is distributed across the mountainous regions of the Trans-Pecos and Mapimian sub provinces of the Chihuahuan Desert, inhabiting a range of habitats from xeric desert scrub to subhumid wooden uplands (Hansen and Salmon 2017). It lives in arid, semi-humid climates such as desert flats, canyons, and mountain areas where it inhabits broken, rocky areas where it can access deep fissures and crevices for shelter and in pursuit of food. This snake rarely ventures above ground in the daylight, it is very secretive and nocturnal (Gehlbach and Baker 1962).

Fort Bliss has no confirmed observations of this kingsnake located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observation. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are only 42 acres (7%) of potential habitat within the project footprint (**Figure 3.7.1**)

Figure 3.7-1. Potential habitat assessment map for Gray-banded Kingsnake



3.7.2 Mottled Rock Rattlesnake (*Crotalus lepidus lepidus*)

Species Description

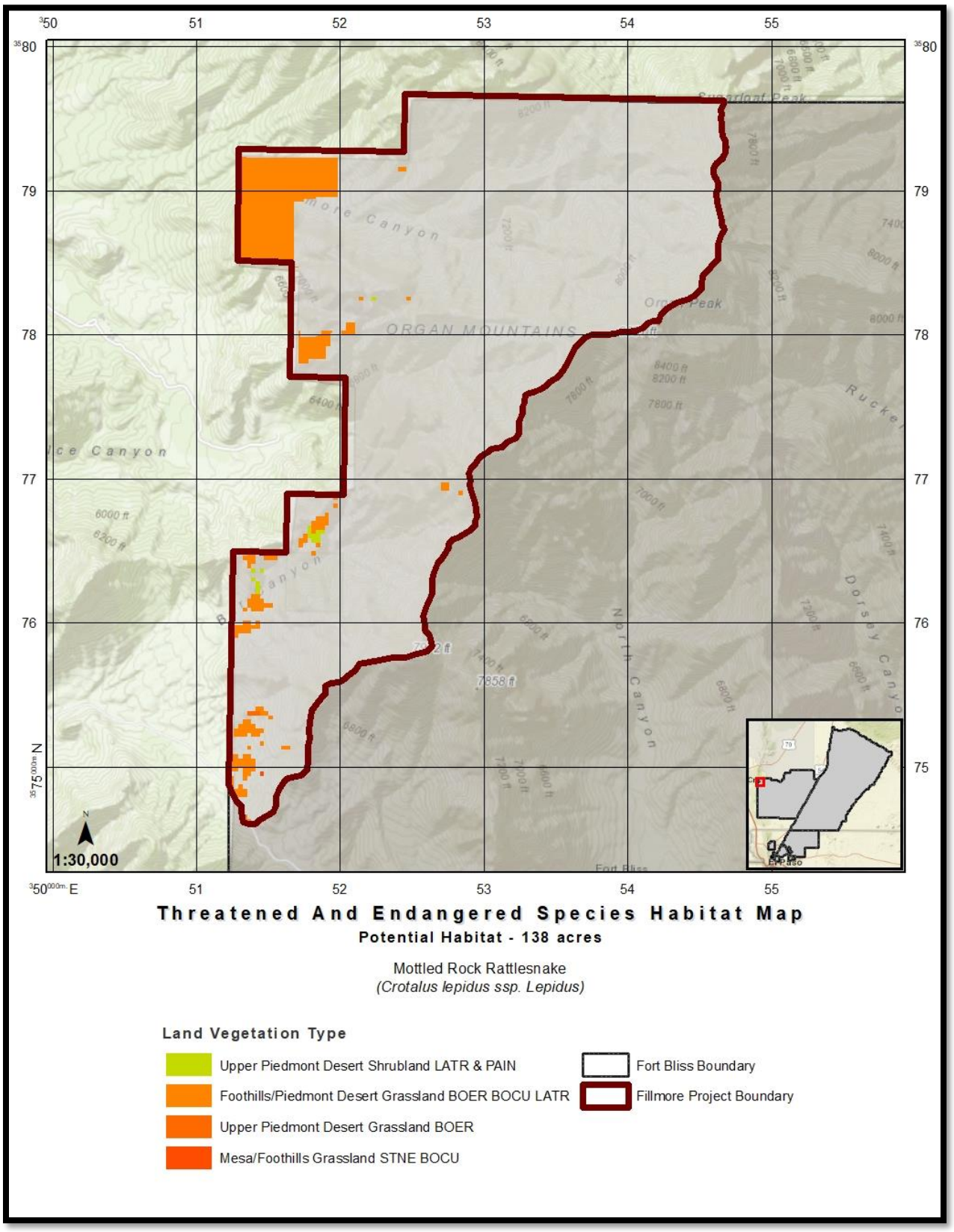
The Mottled Rock Rattlesnake (*Crotalus lepidus lepidus*) is a small pit viper average length is 70 cm that occurs in a variety of background colors ranging from pale gray to bluish gray, a shade of brown or tan, or even pinkish. The dorsal pattern consists of widely separated, narrow, dark, serrated crossbands; and has mottling throughout (Degenhardt 2005).

Habitat Requirements and Limiting Factors

This rattlesnake is typically found in rocky terrain, rocky canyons or hillsides, large rock outcroppings, rocky stream beds, and steep rocky talus slopes in evergreen woodland and montane conifer forests; it basks in open rocky areas in forests near permanent and intermittent springs or streams. Distributed in some regions of north and central Mexico and southern U.S. it can be found in drainages in arid and semi-arid mountains from 300 to 3000 m (Stebbins and Peterson 2003).

Fort Bliss has confirmed observations of this rattlesnake located within the project footprint. INaturalist observation database was also reviewed to confirm any observations occurring near or around the project boundary. This search yielded no observation. Based on the habitat requirements needed to support this species, the habitat assessment map indicated there are 138 acres (7%) of potential habitat within the project footprint (**Figure 3.7.2**).

Figure 3.7-2. Potential habitat assessment map for Mottled Rock Rattlesnake



3.8 Summary of Findings

In summation, only a few of the species with special status have the potential to occur and of those, only a few have confirmed observations within the project footprint. Of the 31 species of birds with special status, the habitat assessment analysis showed that the Organ Mountains only have the habitat requirements of 21 of those species. **Figure 3.8-1** shows that only six of those species have been confirmed.

For plants, of the 14 potential species with special status, the Organ Mountains only have the habitat requirements to sustain eight of these species (**Figure 3.8-2**). For the six invertebrates with a conservation rank, the Organ Mountains only have the correct habitat for three of those species; however, Fort Bliss historical records show four of the species have observation confirmations (**Figure 3.8-3).**

There are seven mammals with special status that were taken into consideration for this analysis. Of those, only five had potential habitat in the Organ Mountains. Fort Bliss only has confirmed historical records for two species (**Figure 3.8-4**). Fort Bliss had no recorded observations for any of the reptile species with special status.

As mentioned earlier, a lack of observations in the databases reviewed for this project does not mean that these species of interest do not occur within Fort Bliss. It only indicates that no confirmed observations have been made yet. There is still more monitoring to be done and many areas to survey.

Figure 3.8-1. Fort Bliss Map of Historical Observations of Birds

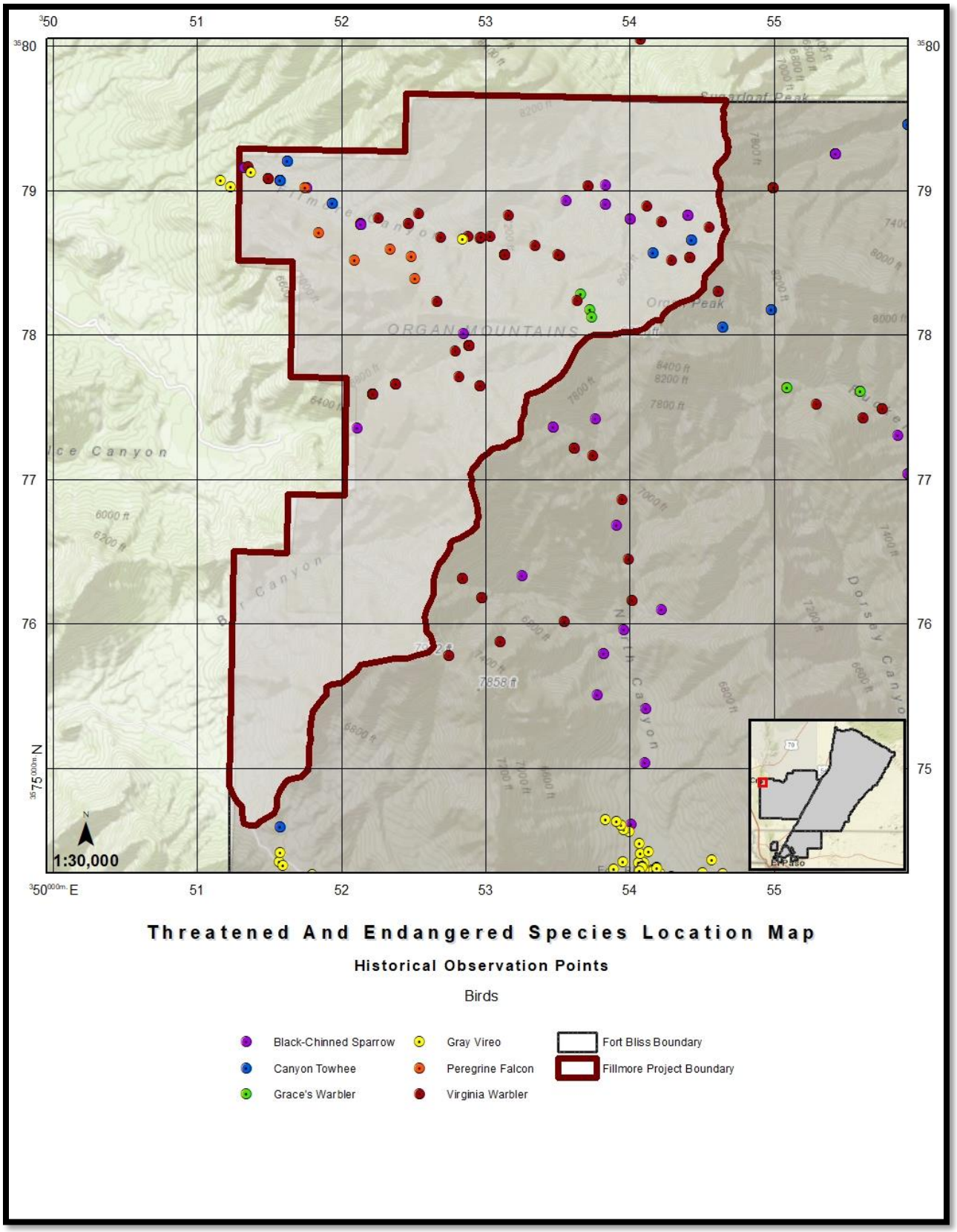


Figure 3.8-2. Fort Bliss Map of Historical Observations of Plants

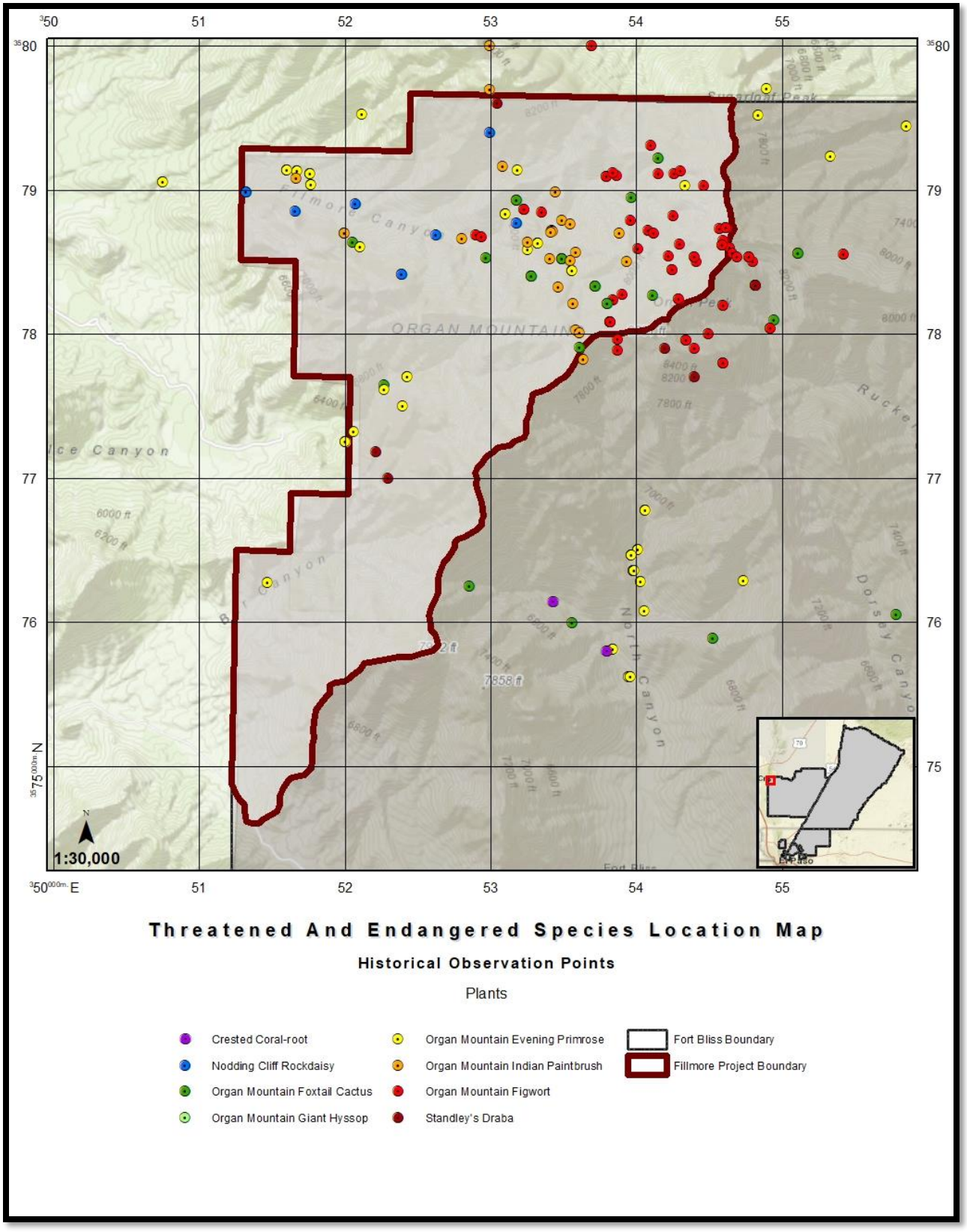


Figure 3.8-3. Fort Bliss Map of Historical Observations of Mammals

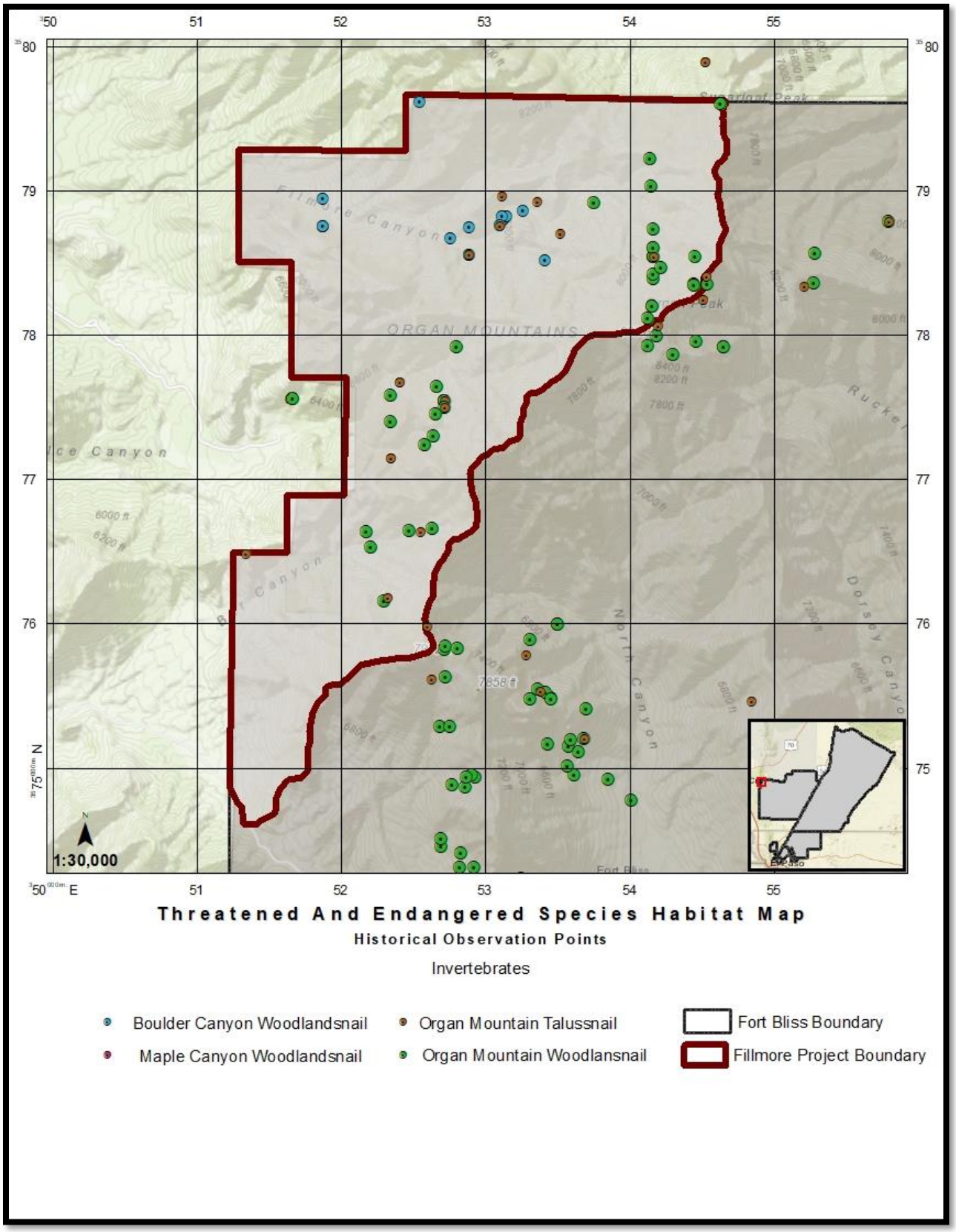
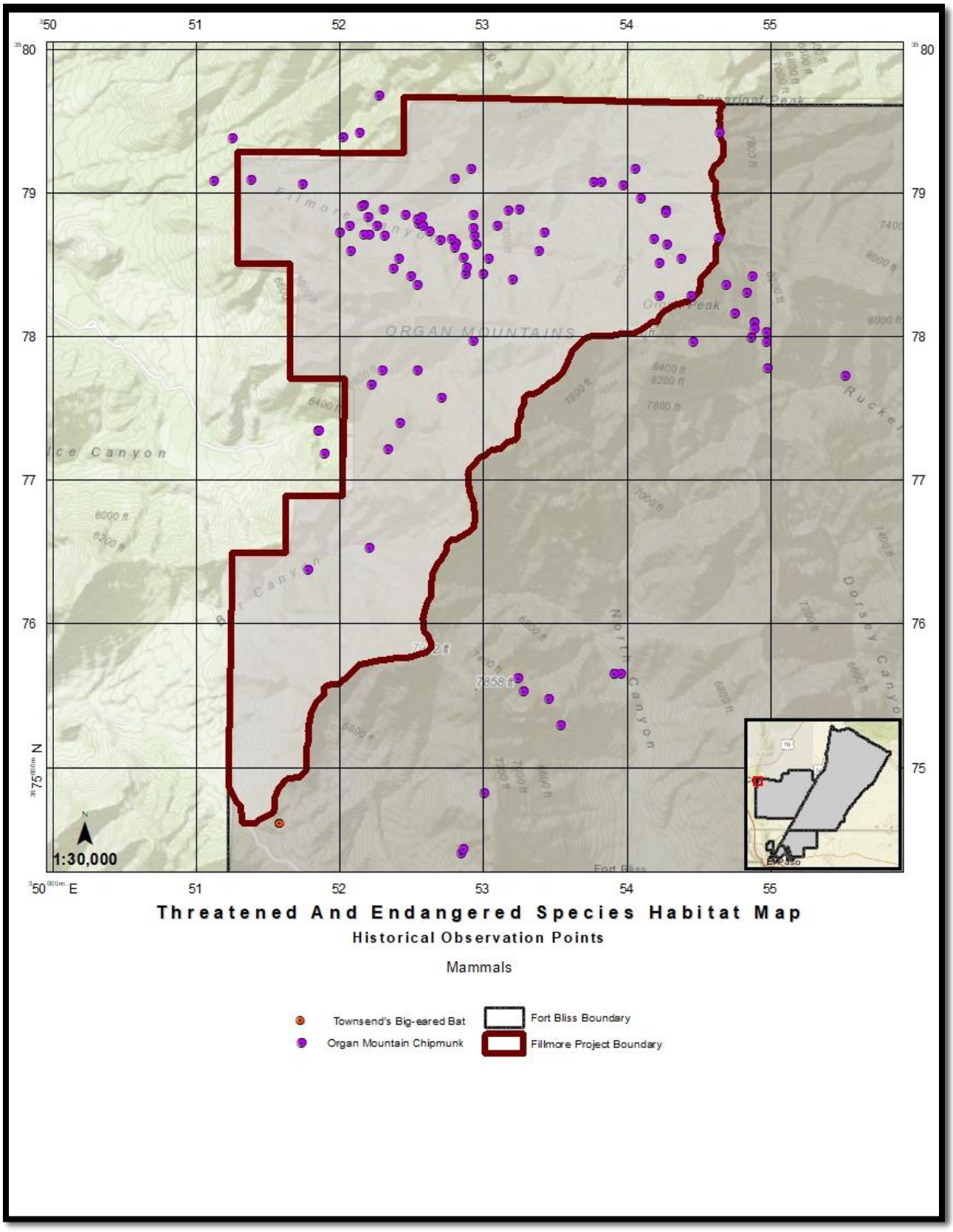


Figure 3.8-4. Fort Bliss Map of Historical Observations of Mammals



4.0 Surface Water

4.1 Project Summary

Spring ecosystems are among the most structurally complicated, ecologically, and biologically diverse, productive, and threatened ecosystems (Stevens and Meretsky 2008). A natural spring is defined as a place where water moving underground finds an opening to the land surface and emerges, sometimes as a trickle, sometimes only after a rain, and sometimes in a continuous flow. Spring water can also emerge from heated rock underground giving rise to hot springs. The amount of water that flows from a spring can depend on a variety of factors, including size of caverns within rocks, water pressure in the aquifer, size of the spring basin and the amount of rainfall. As with other ecological systems, human activities also influence the volume of water that discharges from a spring-groundwater withdrawals in an area can cause water levels in the aquifer system to drop thus impacting the flow from the spring (USGS 2022, Heyns 2009). Because of the scarcity of water sources, impacts of human activity and climate change in arid landscapes, taking inventory, research and monitoring springs will assist in the management, protection and hopefully recovery of these precious water sources.

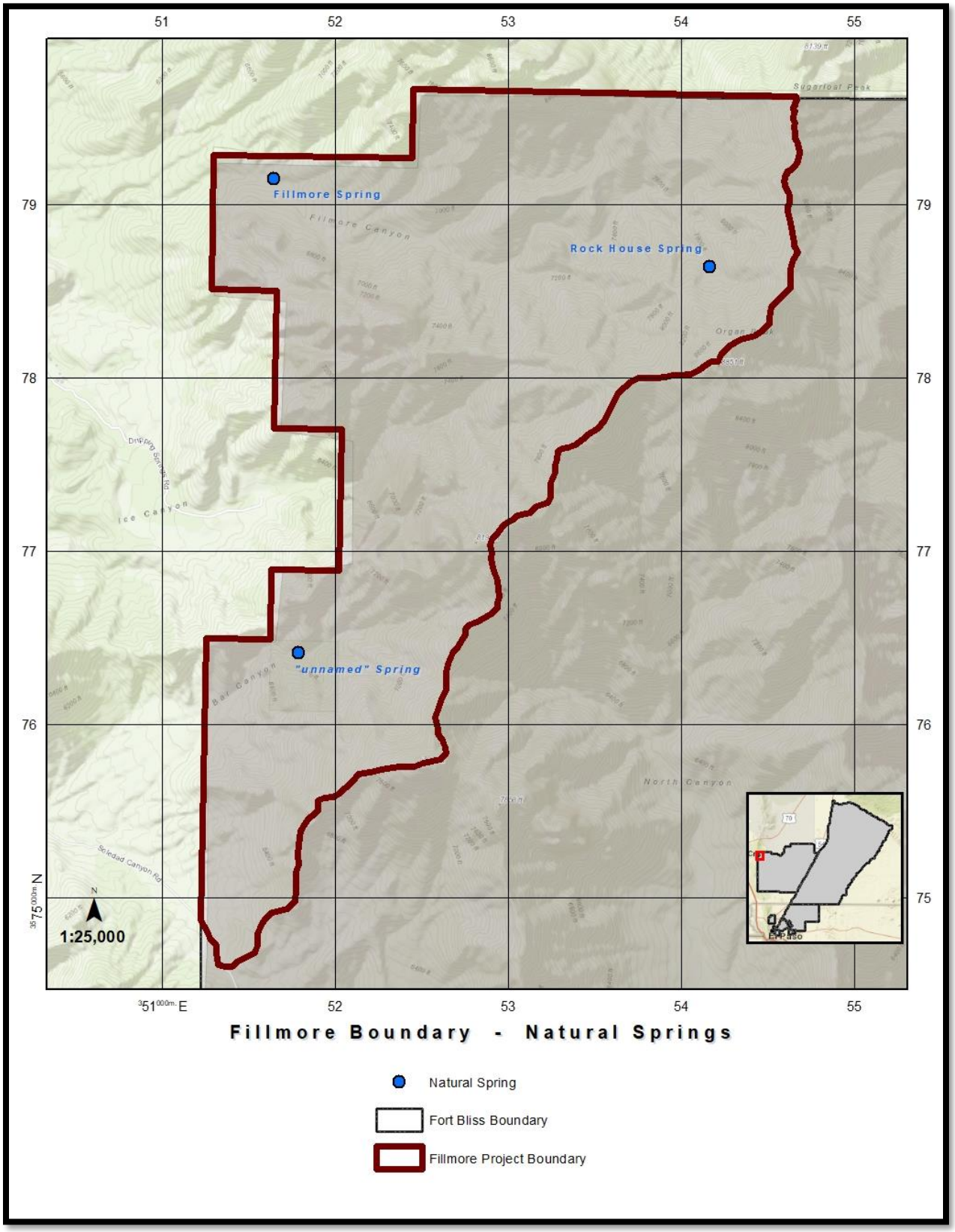
The team was tasked with assessing status of natural springs located within the project area. Surface water and groundwater sources are essential in arid regions as they sustain wildlife and vegetation. Increasing temperatures, low and unreliable rainfall events put a major strain on the existing water sources. In summer 2021 the region received above average rainfall, receiving 3.50 cm (1.38 in) of rain by June, however, even with above average monsoon season, the annual average was still below average with a total of 18.74 cm (7.38 in; Las Cruces Weather Summary 2022).

4.2 Methods

Locality data was gathered for natural springs within the project footprint. Three natural springs were located and mapped (**Figure 4.2-1**). Biologists then visited each spring on May 4, 2022, May 5, 2022, and May 10, 2022. It was noted if there was moisture surrounding the area, flowing water, water depth (if possible) and vegetation health was noted as well. Photographs were taken to keep records of conditions of spring.

Classification of springs depends on 1) discharge magnitude, 2) discharge variability, 3) persistence, 4) water quality, 5) temperature, 6) water chemistry, and 7) geomorphological position. Due to time constraints of this project, only discharge magnitude, variability and persistence were noted.

Figure 4.2-1 Natural Spring location



4.3 Results

Understanding patterns in the amount, quality of water, and their associated plants and animals can help evaluate overall status of water resources in the area. There are diverse types and classifications of spring. Gravity (or descending) springs emerge under confined conditions where water table intersects land surface. Artesian (or ascending) springs discharge under pressure due to confined conditions in the underlying aquifer.

Three springs were located and visited, Fillmore Spring (**Figure 4.3-1**), Rock House Spring (**Figure 4.3-2**), and an unnamed spring (**Figure 4.3-3**). All three springs were visually assessed, and all springs had little to no flowing water. They are all intermittent or rhythmic springs as they flow at intervals.

Fillmore Spring

Fillmore Spring had water pooled in certain areas along the stream bed, and near the head of the spring there was a slight flow (**Figure 4.3-1**) at approximately 1915m (6281 ft) in elevation flowing west towards Fillmore Waterfall. The spring is lined with various forbs and shrubs as well as Ponderosa Pine, Alligator Juniper, and Gamble Oak.

Figure 4.3-1. Fillmore Spring photograph

Fillmore Spring, (13S CR 5163 79147) located in Fillmore Canyon just above Fillmore waterfall. In 1939, Sterling Emerson described Fillmore Spring as a permanent spring with water flowing supporting a healthy population of Organ Mountain primrose and various forbs, pines and shrubs.

Rock House Spring

Rock House Spring is located at a higher elevation than Fillmore spring; it is past The Narrows and 800m. (2622ft.) northwest of Organ Peak. It is located at an elevation of 2391m. (7847ft). Upon inspection, the team could not locate an actual spring head, water was slowly flowing and pooling down a steep stream bed below the spring head (**Figure 4.3-2**).

Figure 4.3-2. Rock House Spring photograph

Rock House Spring (13SCR5416478637) flows down a steep western facing slope. Water flow was low and slow, and much like Fillmore Spring, water was stagnant in parts.

Unnamed Spring

The unnamed spring is located on the eastern end of Bar Canyon, just southeast of Dripping Springs. During the site visit there were no signs of water flowing, however, it was noted that there was moist soil along the site where the spring is located. This is shown by the green vegetation lining the length of the spring. This is indicative of water just below the surface. It would require increased monitoring and analysis to properly assess the conditions of the spring.

Figure 4.3-3. Unnamed spring photograph

Unnamed Spring (13SCR51783 76420), located in Bar Canyon is an intermittent spring.

4.4 Summary of Findings

All three of the streams would be classified as intermittent or rhythmic springs as they are not constantly flowing but do show signs of the presence of water. This is in drastic contrast to how springs in the Organ Mountains were once described. In spring of 1852, Charles Wright described springs in the Organs as having "wet springy soil, ravines in the Organ Mountains" while collecting yellow columbines, a plant associated with water sources and rainfall in the Organs (Wooton and Standley 1915).

Increased monitoring and a more in-depth analysis would provide more information into the overall health of these streams.

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