A BIOLOGICAL EVALUATION OF 60 PROPOSED CUSTOMS AND BORDER PROTECTION TOWER LOCATIONS IN TUCSON WEST

REPORT ADDENDUM

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Prepared for:
United States Customs and Border Protection

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TABLE OF CONTENTS

INTRODUCTION

On 11 January 2008 Harris Environmental Group, Inc. (Harris Environmental) submitted a Biological Evaluation that reviewed the installation of 60 proposed Customs and Border Protection (CBP) tower locations in an operational region designated Tucson West. Twelve new locations were proposed to augment the existing design as submitted and CBP requested that Harris Environmental prepare an addendum to the existing report to include these new locations. This report details the review of 12 newly proposed tower locations (10 preferred locations and two alternates) within Tucson West. This report is submitted to CBP to append the existing report titled A Biological Evaluation of 60 Proposed Customs and Border Protection Tower Locations in Tucson West (Revision 1.1) (HEG 2008).

The proposed tower compounds are in Pima County on land managed by the Coronado National Forest (CNF), Buenos Aires National Wildlife Refuge (BANWR), the Organ Pipe Cactus National Monument (OPCNM), CBP, and private entities. Detailed location information for each surveyed parcel is presented in Table 1.1. All areas surveyed in support of this effort (including alternate and rejected locations) are discussed in this addendum. CBP is preparing an Environmental Assessment for proposed installations in the *Tucson West* operational area. Consultation with the United States Fish and Wildlife Service (USFWS) is being conducted by CBP.

Table 1.1. Summary of Tower Compound Location Information.

Tower	Latitude	Longitude	Land Jurisdiction	Elevation (ft)
Preferred Tower Locations				
TCA-AJO-304	31.95661	112.80584	OPCNM	1,693
TCA-AJO-305	32.27538	112.73978	CBP	1,775
TCA-NGL-285	31.41027	110.82481	Private	4,300
TCA-TUS-287	31.49455	111.55467	BANWR	3,659
TCA-TUS-290	31.59331	111.34944	Private	3,733
TCA-TUS-291	31.48443	111.54355	USA-Sasabe Port of Entry	3,575
TCA-TUS-298	31.45848	111.43437	CNF	3,808
TCA-TUS-299	31.48208	111.4708	BANWR	3,647
TCA-TUS-306	31.64743	111.49896	BANWR	3,464
TCA-TUS-307	31.64738	111.49968	BANWR	3,465
Rejected Tower Locations				
TCA-TUS-289	31.5572	111.46481	BANWR	3,817
TCA-TUS-297	31.54706	111.45942	BANWR	3,767

Surveyed Acres

A total of 46.9 total acres (18.9 ha) including:

- Block Survey of about 1.0 acre (0.4 ha) at ten distinct parcels; at TCA-TUS-306 and TCA-TUS-307, slightly over one acre was surveyed (1.3 acres and 1.2 acres respectively); for a total of about 12.5 acres (5.0 ha) and,

- Linear Survey along about 2.37 mi (3.8 km) of roadway. The examined corridor was 40 m-wide (120 ft-wide) with 20 m of coverage on either side of the roadway centerline. Total linear survey coverage was about 34.4 acres (13.9 ha).

2.0 METHODS

All field methods outlined in the original report were followed for this additional work (HEG 2008).

3.0 SURVEY RESULTS

Preferred Tower Locations — AJO Section (AJO)

TCA-AJO-304

TCA-AJO-304 is within the OPCNM approximately 8.8 km (5.5 mi) north of the U.S./Mexico International Border and the Lukeville International Port-of-Entry in southeastern Pima County. The compound is at the base of a small ridge at the southeastern end of the Puerto Blanco Mountains approximately 0.5 km (0.3 mi) northwest of the OPCNM headquarters (Figure 4.1). The elevation is 516 m (1,693 ft) amsl. The substrate is granitic cobbles and pebbles and the soils are derived from volcanic, granitic, and limestone deposits.

TCA-AJO-304 is approached from the town of Why via Highway 85 and a paved road leading west from the OPCNM headquarters. The proposed access route uses a small unpaved area within the surveyed compound. The proposed route traverses federal land and requires some surface disturbance to establish the access route. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound.

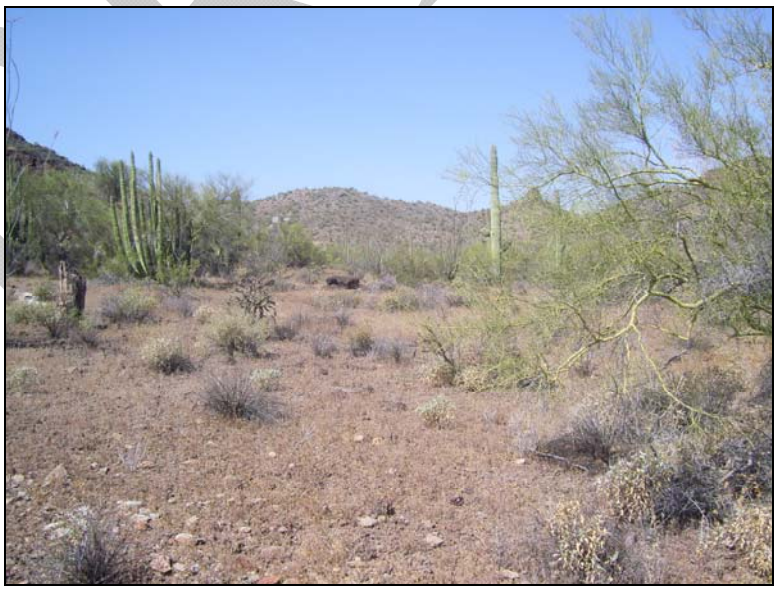

Figure 4.1 Overview of TCA-AJO-304.

Survey Results

TCA-AJO-304 is within the Arizona Upland subdivision of the greater Sonoran Desertcrub vegetative community. Plants observed during the survey include teddy-bear cholla, staghorn cholla, buckhorn cholla, organ pipe cacti, ocotillo, foothill palo-verde, creosotebush, saguaro, brittlebush, triangle-leaf bursage, hedgehog cacti, Arizona Sonoran rosewood, and mixed grasses and forbs. The compound is approximately 0.1 km (0.5 mi) northwest of a small unnamed drainage containing xeroriparian vegetation.

Potential Waters of the U.S. (PWUS)

No PWUS were identified in association with the TCA-AJO-304 compound or proposed ingress/egress routes.

TCA-AJO-305

TCA-AJO-305 is located approximately 1.0 km (0.7 mi) north of Why, Arizona approximately 43.7 km (27.2 mi) north of the U.S./Mexico International Border and the Lukeville International Port-of-Entry in southern Pima County. The compound is located on a relatively flat vacant lot adjacent to an existing CBP Station (Figure 4.2). The Pozo Redondo Mountains are northeast of the proposed compound and the Little Ajo Mountains are to the northwest. Gunsight Wash is approximately 4.3 km (2.6 mi) south of the compound. Elevation is about 541 m (1,775 ft) amsl and the substrate is a combination of silt and sand with scattered pebbles.

TCA-AJO-305 is approached from the town of Why via Highway 85 and is accessed from within the existing CBP Station. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound.

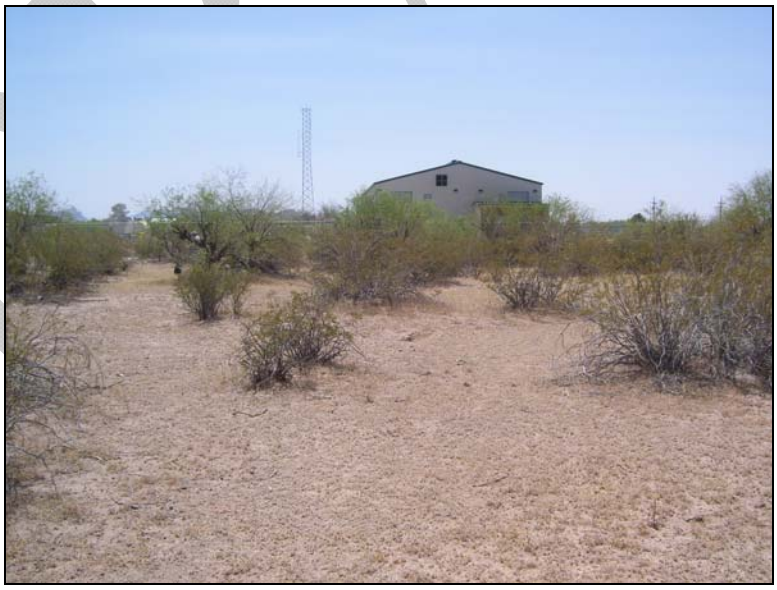

Figure 4.2 Overview of TCA-AJO-305 looking south.

Survey Results

TCA-AJO-305 and the surrounding area are within the Lower Colorado River subdivision of the greater Sonoran Desertscrub vegetative community. Plants observed during the survey include velvet mesquite, creosotebush, desert ironwood, and mixed grasses and forbs. Wildlife documented during the field survey includes house sparrow (*Passer domesticus*) and cactus wren (*Campylorhynchus brunneicapillus*).

Potential Waters of the U.S. (PWUS)

No PWUS were identified in association with the TCA-AJO-305 compound or proposed ingress/egress routes.

Preferred Tower Locations — Nogales Section (NGL)

TCA-NGL-285

TCA-NGL-285 is located on private property west and directly adjacent to the CNF approximately 8.4 km (5.2 mi) north of the U.S./Mexico International Border about 14.0 km (8.8 mi) northeast of the Nogales International Port-of-Entry in southern Santa Cruz County. The proposed compound is positioned at the crest of a prominent ridge extending west from the foothills of the Patagonia Mountains. The elevation is 1,311 m (4,300 ft) amsl. The substrate is gravel with scattered rocks and boulders mixed with sandy loam and significant organic material.

TCA-NGL-285 is approached from Nogales via Highway 82 to Duquesne Road. From the intersection of Highway 82 and Duquesne Road the approach continues east for approximately 3.4 km (2.1 mi) on Duquesne Road to a private unpaved road heading northeast into Wild Hog Canyon. From the private unpaved road, access is gained via a smaller unpaved road which exits north up to the higher ridge and the proposed compound. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound and the access road.

Survey Results

The compound is approximately 0.5 km (0.3 mi) southwest of a Tascala Tank, 1.1 km (0.7 mi) south of Paloma Well, and 2.3 km (1.4 mi) northeast of Jim Dam. Tascala Canyon is 0.3 km (0.2 mi) north of the compound and Wild Hog Canyon is 1.1 km (0.7 mi) to the south (Figure 4.3). TCA-NGL-285 is within a semidesert grassland vegetation community. Plants observed during the survey include velvet mesquite, fairy duster, beargrass, wait-a-minute bush, ocotillo, fishhook barrel cactus, cane cholla, pancake cactus, Arizona rainbow cactus, and mixes grasses and forbs.

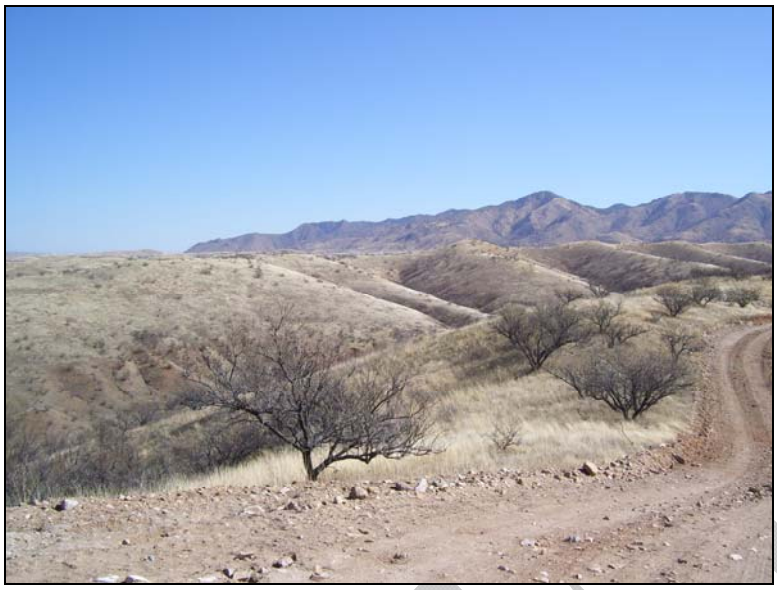

Figure 4.3 Overview of TCA-NGL-285.

Potential Waters of the U.S. (PWUS)

No PWUS were identified in association with the TCA-NGL-285 compound or proposed ingress/egress routes.

TCA-TUS-287

TCA-TUS-287 is in southern Pima County on BANWR land approximately 0.9 km (0.5 mi) north of the U.S./Mexico International Border and about 1.6 km (1.0 mi) northwest of the Sasabe International Port-of-Entry (Figure 4.4). The compound is located at the top of a small hill at the southern end of the Altar Valley with the Pozo Verde Mountains to the west and the San Luis Mountains to the east. The approximate elevation is 1,115 m (3,659 ft) amsl. The location contains rock outcrops intermixed with silty loam and fine sands.

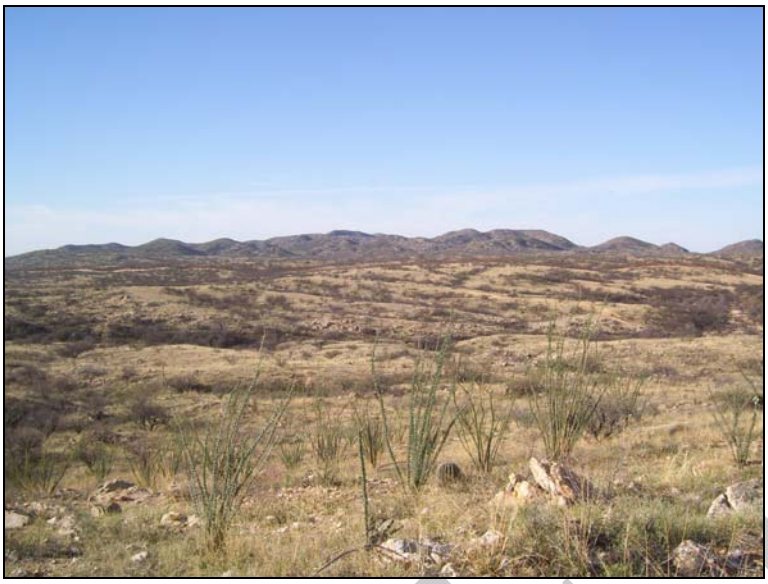

Figure 4.4 Overview of TCA-TUS-287 looking south

The approach to TCA-TUS-287 is via SR 286 and La Osa Road. The proposed access would be via an existing unpaved road that intersects with La Osa Road (Figure 4.5). Access crosses ASLD land and private land. Survey coverage for TCA-TUS-287 included the 0.4 ha (1.0 acre) tower compound and the access road between La Osa Road and the tower compound. HEG (2008) also covered the portions of La Osa Road until its intersection with SR 286.

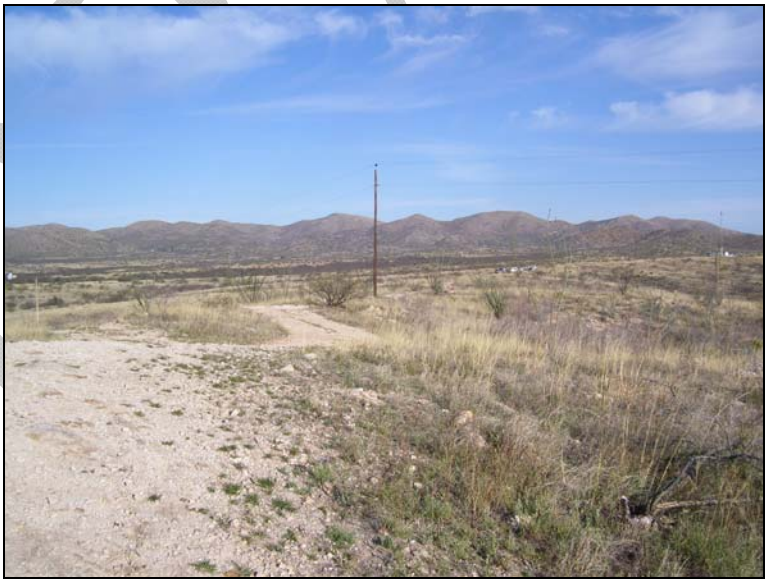

Figure 4.5 TCA-TUS-287 access road looking west

Survey Results

TCA-TUS-287 and the surrounding area are within the semidesert grassland vegetative community. Mixed grasses and forbs comprise the plants observed during the survey. Evidence of wildlife documented at the compound includes rodent (*Rodentia*) burrows, a white-throated woodrat (*Neotoma albigula*) midden, and deer (*Odocoileus* sp.) feces. Special status species documented during field surveys include staghorn cholla and Santa Cruz striped agave.

The compound is approximately 0.3 km (0.2 mi) north of La Osa Wash which is characterized by xeroriparian vegetation. A small unnamed water tank is roughly 0.4 km (0.3 mi) southeast of the compound and an unnamed well is 0.5 km (0.3 mi) to the southwest. A second unnamed water tank is approximately 0.8 km (0.5 mi) northwest of the compound, and a third water tank is 2.3 km (1.4 mi) northeast. These features have the capacity to retain surface water, perennially or annually, for a significant period and provide habitat for aquatic and semi-aquatic species.

Potential Waters of the U.S. (PWUS) at TCA-TUS-287

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	6.0'	Incised channel, sheet flow	31.49574	111.55565
A (downstream)	11.0'	Incised channel, sheet flow	31.49574	111.55568

**OHWM = Ordinary High Water Mark*

TCA-TUS-290

TCA-TUS-290 is in southern Pima County on private land approximately 2.9 km (1.8 mi) northwest of Arivaca and about 19.2 km (11.9 mi) north of the U.S./Mexico Border. The compound is located on a south facing slope at the extreme southeast end of Las Guijas Mountains just north of Arivaca Creek. The approximate elevation is 1,138 m (3,733 ft) amsl. The substrate is angular gravel and cobbles and soil composed of sandy clay loam mixed with very little organic material.

TCA-TUS-290 is approached via Arivaca Road and accessed via an unpaved road 2.5 km (1.5 mi) west of Arivaca (Figure 4.6 and Figure 4.7). Survey coverage for this proposed tower included the 0.4 ha (1.0 acre) tower compound and the entire length of the proposed access road.

Survey Results

TCA-TUS-290 and the surrounding area are within the semidesert grassland vegetative community. Plants observed during the survey include velvet mesquite, scrub oak, desert hackberry, wolfberry, fairy duster, graythorn, red barberry, wait-a-minute bush, snakeweed, ocotillo, burroweed, Christmas cholla, Engelmann's prickly pear, and mixed grasses and forbs. Evidence of wildlife documented at the compound includes desert cottontail (*Sylvilagus adubonii*) scat and jackrabbit (*Lepus* sp.) scat. Wildlife observed during the field surveys includes multiple house sparrows (*Passer domesticus*) and ravens (*Corvus* sp.), a sharp-shinned hawk (*Accipiter striatus*), ladder-backed woodpecker (*Picoides scalaris*), and turkey vulture

(*Cathartes aura*). Special status species documented during field surveys include staghorn cholla and Pima pineapple cactus.

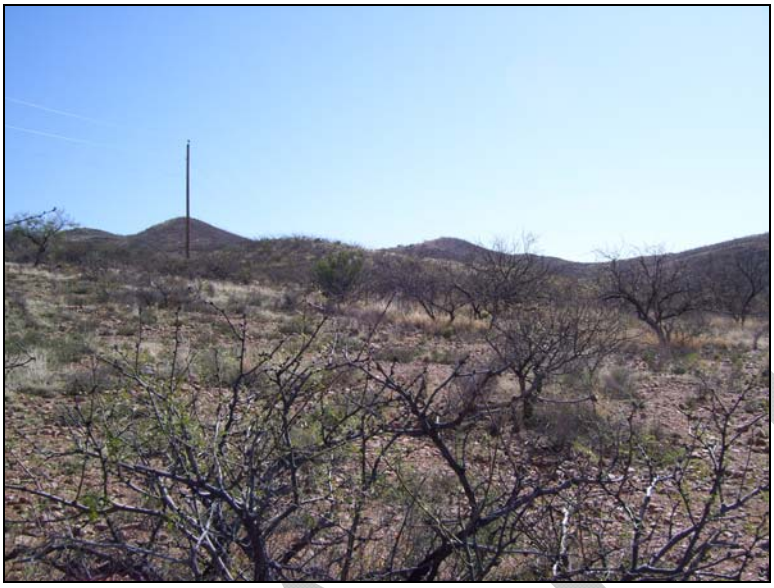

Figure 4.6 Overview of TCA-TUS-290 looking north

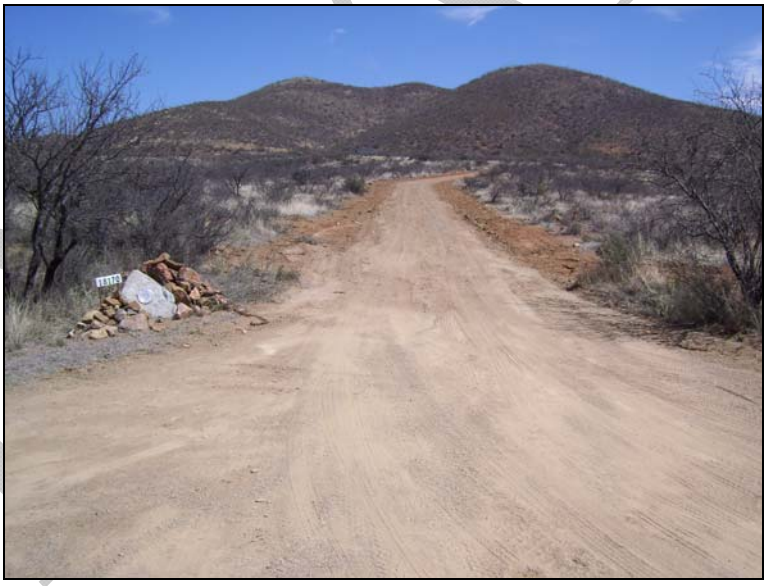

Figure 4.7 TCA-TUS-290 approach road looking north

The compound is approximately 0.9 km (0.5 mi) north of Arivaca Creek. No obvious man-made structures or natural features, with the capacity to retain water, aside from the annual flow of Arivaca Creek, were identified within a 2.5 km (1.6 mi) radius of the proposed compound.

Potential Waters of the U.S. at TCA-TUS-290

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	21.0'	Incised channel, debris line	31.59229	111.35207
A (downstream)	21.0'	Vegetation, cut banks	31.59229	111.35207

TCA-TUS-291

TCA-TUS-291 is located in southern Pima County at the southern end of the Altar Valley between the Pozo Verde Mountains and the San Luis Mountains. The location is adjacent to the Sasabe International Port-of-Entry (Figure 4.8). The western portion of the proposed compound is graded and mostly lacking vegetation. The approximate elevation is 1,090 m (3,575 ft) amsl.

The tower would be approached via SR 286 (South Sasabe Road) and accessed by a short paved road requiring no modification. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound.

Survey Results

TCA-TUS-291 and the surrounding area are within the semidesert grassland vegetative community. Plants observed during the survey include velvet mesquite, cat-claw acacia, desert broom, snakeweed, fairy duster, wolfberry, Engelmann's prickly pear, fishhook barrel cactus, and mixed grasses and forbs. Wildlife documented at the compound during field surveys includes desert cottontail (*Sylvilagus audubonii*), white-winged dove (*Zenaida asiatica*), Gambel's quail (*Callipepla gambelii*), house sparrows (*Passer domesticus*), and black vultures (*Coragyps atratus*). Staghorn cholla was the only special status species documented during field surveys.

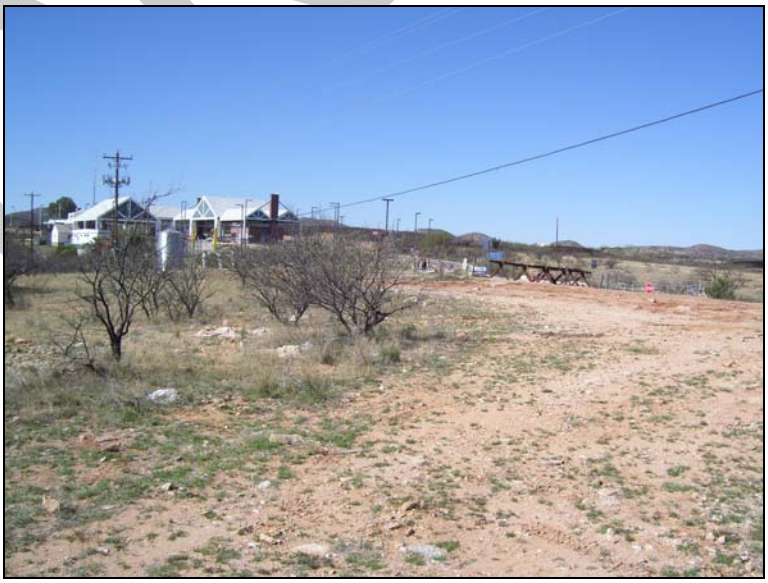

Figure 4.8 TCA-TUS-291 from northeast corner of tower compound looking southwest

The compound is approximately 0.3 km (0.2 mi) south of La Osa Wash, which is characterized by xeroriparian vegetation. A small water tank is roughly 1.0 km (0.6 mi) northwest of the compound, and an unnamed well is 1.6 km (1.0 mi) is west/northwest. A second unnamed water tank is approximately 2.4 km (1.5 mi) northwest of the compound, and La Osa Tank is 2.4 km (1.5 mi) northeast. These features have the capacity to retain surface water, perennially or annually, and provides habitat for aquatic and semi-aquatic species.

Potential Waters of the U.S. at TCA-TUS-291

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	17.0'	Incised channel, vegetation	31.48410	111.54363
A (downstream)	17.0'	Incised channel, vegetation	31.48410	111.54360
B (upstream)	4.0'	Incised channel, vegetation	31.48410	111.54363
B (downstream)	4.0'	Incised channel, vegetation	31.48410	111.54363

TCA-TUS-298

TCA-TUS-298 is within the CNF in southern Pima County approximately 1.2 km (0.7 mi) north of the U.S./Mexico International Border. The compound is located on a small undisturbed hill just north of Fresnal Wash and south of Cumero Mountain (Figure 4.9). The approximate elevation is 1,161 m (3,808 ft) amsl. The location contains angular gravel and scattered rocks with exposed bedrock appearing at the northern end of the parcel. The compound is approximately 0.7 km (0.4 mi) northwest of Fresnal Wash.

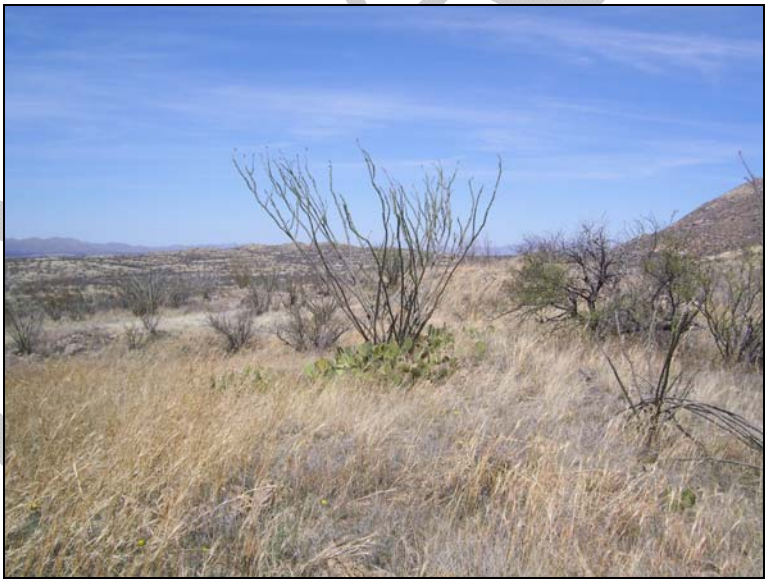

Figure 4.9 Overview of TCA-TUS-298 looking southwest

The compound is approximately 0.7 km (0.4 mi) northwest of Fresnal Wash. Approach to this location is via SR 286 and access is via Tres Boleros Road. The routing is shared with the routings used to reach TCA-TUS-033 and TCA-TUS-186. TCA-TUS-298 is positioned north of Tres Boleros Road a USFS-maintained road that would require no improvements. A new access

road is planned between Tres Boleros Road and the proposed compound. Extensive portions of this road were recently widened and graded and may negate the need for any new road improvements.

Survey coverage for TCA-TUS-298 included the 0.4 ha (1.0 acre) tower compound and the portion of access road between Tres Boleros Road and the proposed compound (Figure 4.10). Two access routes were surveyed for this proposed compound. The alternate routing was the first route surveyed which identified an archaeological site designated AZ DD:11:11(ASM). The preferred route was designed to avoid encroachment on the known limits of AZ DD:11:11(ASM). Survey coverage did not include Tres Boleros Road and any proposed improvements along this road would prompt additional survey requirements.

Survey Results

TCA-TUS-298 and the surrounding area are within the semidesert grassland vegetative community. Plants observed during the survey include velvet mesquite, New Mexico locust, ocotillo, wait-a-minute bush, snakeweed, wolfberry, Engelmann's prickly pear, chain-fruit cholla, fishhook barrel cactus, and mixed grasses and forbs. Evidence of wildlife documented at the compound includes rodent (Rodentia) burrows, avian (Aves) feces, and a hummingbird (*Trochilidae*) nest. A turkey vulture (*Cathartes aura*), multiple ravens (*Corvus* sp.), and a red-tailed hawk (*Buteo jamaicensis*) were also documented during the survey. A canyon giant spotted whiptail was observed along the proposed access route. Special status species identified during field surveys include staghorn cholla, needle-spined pineapple cactus, and canyon giant spotted whiptail.

Figure 4.10 TCA-TUS-298 proposed access road looking south

Coches Tank is about 1.4 km (0.9 mi) northeast of the compound and Cave Road Tank is about 2.5 km (1.6 mi) east/southeast. These features have the capacity to retain surface water, perennially or annually, and provides habitat for aquatic and semi-aquatic species.

Potential Waters of the U.S. for TCA-TUS-298

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	10.0'	Sheet flow, vegetation	31.45758	111.43449
A (downstream)	10.0'	Sheet flow, vegetation	31.45758	111.43449
B (upstream)	8.0'	Incised channel, cut banks, vegetation	31.45571	111.43490
B (downstream)	8.0'	Incised channel, cut banks, vegetation	31.45571	111.43490
C (upstream)	4.5'	Incised channel	31.45451	111.43548
C (downstream)	7.0'	Incised channel	31.45448	111.43550
D (upstream)	4.5'	Incised channel, vegetation	31.45399	111.43605
D (downstream)	3.0'	Incised channel	31.45390	111.43601
E (upstream)	10.0'	Incised channel	31.45445	111.43782
E (downstream)	6.0'	Incised channel, sheet flow	31.45437	111.43790
F (upstream)	1.5'	Incised channel	31.45447	111.43860
F (downstream)	1.5'	Incised channel	31.45447	111.43860
G (upstream)	8.0'	Incised channel, cut banks	31.45395	111.44010
G (downstream)	19.0'	Incised channel, cut banks, vegetation	31.45389	111.44008
H (upstream)	45.0'	Incised channel, cut banks	31.45398	111.44042
H (downstream)	54.0'	Incised channel, cut banks	31.45343	111.44037
I (upstream)	2.0'	Incised channel	31.46174	111.44556
I (downstream)	1.5'	Incised channel	31.46175	111.44562
J (upstream)	3.0'	Incised channel	31.46261	111.44605
J (downstream)	3.0'	Incised channel	31.46254	111.44611

TCA-TUS-299

TCA-TUS-299 is in southern Pima County within the BANWR approximately 2.5 km (1.6 mi) north of the U.S./Mexico International Border. The compound is on a small hill within the Canoa Wash floodplain west of Cumero Mountain (Figure 4.11). The approximate elevation is 1,112 m (3,647 ft) amsl. The substrate at the compound is angular gravel and cobbles with silty loam and fine sands.

The proposed compound is approximately 0.6 km (0.4 mi) west of Canoa Wash. TCA-TUS-299 is approached from Sasabe via Highway 286 and accessed via an unpaved road approximately 0.7 km (4.3 mi) north of the International Port-of-Entry. After traveling east approximately 4.4 km (2.8 m), the access route continues east along the north fork for 7.3 km (4.5 mi) to the compound, which is just off the north side of the access road. The proposed route traverses federal land and requires no improvements. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound.

Figure 4.11 TCA-TUS-299 from tower compound center looking west

Survey Results

TCA-TUS-299 and the surrounding area are within the semidesert grassland vegetation community. Plants observed during the survey include range ratany, fairy duster, snakeweed, burroweed, chain-fruit cholla, fishhook barrel cactus, and mixed grasses and forbs. The compound is disturbed and devoid of trees. Rodent (Rodentia) burrows and a raven (*Corvus* sp.) were the only evidence of wildlife documented at the compound. Staghorn cholla was the only special status species documented during field surveys.

The compound is approximately 0.6 km (0.4 mi) west of Canoa Wash, which is characterized by xeroriparian vegetation. A small stock tank/reservoir north of Garcia Ranch is roughly 1.3 km (0.8 mi) northeast of the compound, and the slightly larger Marijuana Tank is 1.7 km (1.1 mi) west. A second unnamed stock tank/reservoir is approximately 1.7 km (1.1 mi) east/southeast of the compound, and Rock Tank is 2.5 km (1.6 mi) to the northeast. Man-made structures or natural features with the capacity to retain surface water, perennially or annually, and provides habitat for aquatic and semi-aquatic species.

Potential Waters of the U.S.

No PWUS were identified in association with the TCA-TUS-299 compound or proposed ingress/egress routes.

TCA-TUS-306

TCA-TUS-306 is within the Buenos Aires National Wildlife Refuge (BANWR) approximately 19.6 km (12.2 mi) north of the U.S./Mexico International Border and 18.7 km (11.6 mi) north/northeast of the Sasabe International Port-of-Entry in southern Pima County. The compound is west of the intersection of Highway 286 and Arivaca Road at the southern end of

Altar Valley north of the intersection of Las Moras Wash and Highway 286 (Figure 4.12). The elevation is 1,056 m (3,464 ft) amsl. The substrate is composed of clay and fine silt with significant amounts of organic debris.

TCA-TUS-306 is approached via Highway 286. Access to the compound is gained via a gate and a proposed new road which would be contained within the surveyed compound. Survey coverage for this proposed tower installation included a block survey of about 1.2 ha (3.0 acre) for the tower compound and the associated access route for TCA-TUS-306 and TCA-TUS-307.

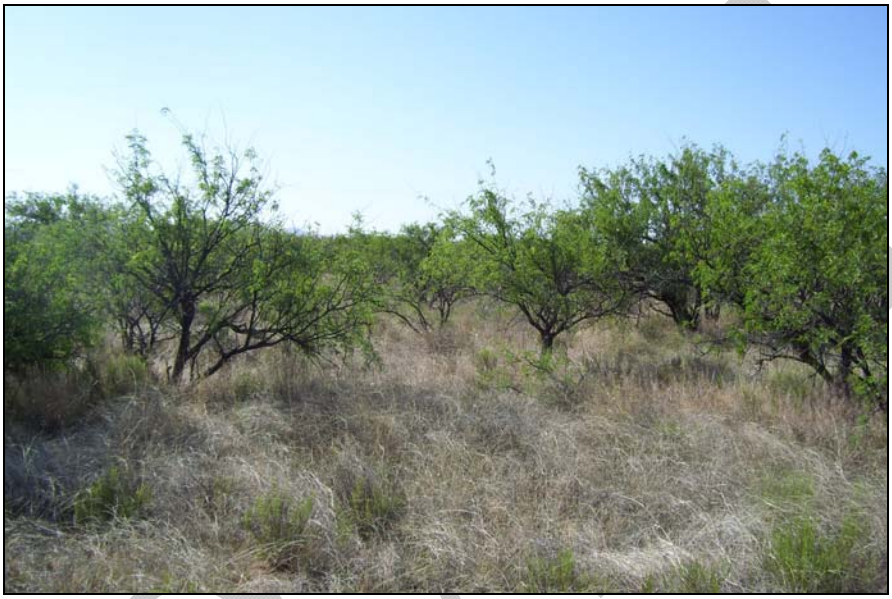

Figure 4.12 Overview of TCA-TUS-306.

Survey Results

TCA-TUS-306 and the surrounding area are within a semidesert grassland vegetation community. Plants observed during the survey include velvet mesquite, gutierrezia, soaptree yucca, burroweed, and mixed grasses and forbs. Wildlife documented at the compound include house finch (*Carpodacus mexicanus*), raven (*Corvus* sp.), pyrrhuloxia (*Cardinalis sinuatus*), and western whiptail (*Aspidoscelis tigris*). Deer (*Odocoileus* sp.) tracks were also documented during the field survey. The compound is approximately 0.3 km (0.2 mi) north of Las Moras Wash which is characterized by xeroriparian vegetation. An unnamed water tank is roughly 0.8 km (0.5 mi) northwest of the compound and an unnamed reservoir is approximately 1.1 km (0.7 mi) to the southwest.

Potential Waters of the U.S. (PWUS)

No PWUS were identified in association with the TCA-TUS-306 compound or proposed ingress/egress routes.

TCA-TUS-307

TCA-TUS-306 is within the BANWR approximately 19.6 km (12.2 mi) north of the U.S./Mexico International Border and 18.7 km (11.6 mi) north/northeast of the Sasabe International Port-of-Entry in southern Pima County. The compound is located just west of the intersection of Highway 286 and Arivaca Road at the southern end of Altar Valley (Figure 4.13). The elevation is 1,056 m (3,465 ft) amsl. The substrate at the compound is clay and fine silt.

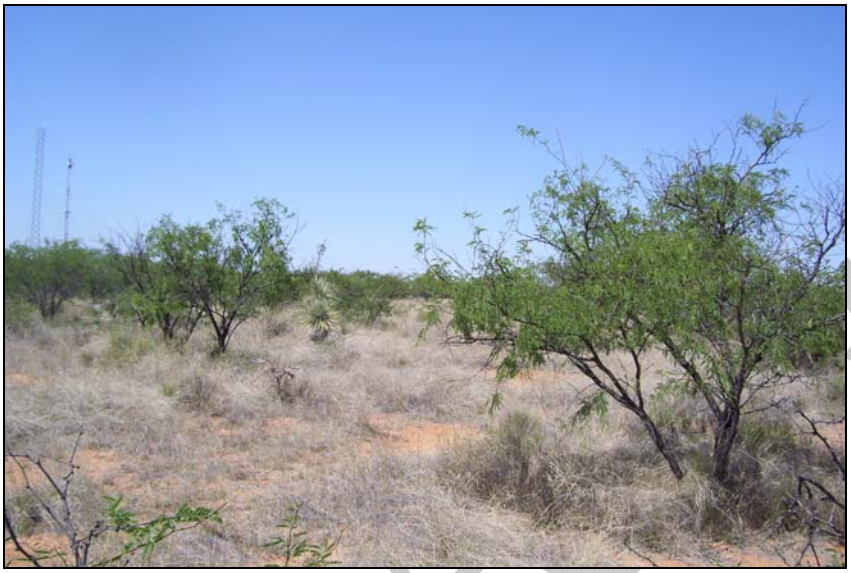

Figure 4.13 Overview of TCA-TUS-307 looking northwest

TCA-TUS-307 is approached via Highway 286. Access to the compound is gained via a gate and a proposed new road which would be contained within the surveyed compound. Survey coverage for this proposed tower installation was conducted in conjunction with survey at TCA-TUS-306 which included a block survey of about 1.2 ha (3.0 acre) for both tower compounds and associated access routes.

Survey Results

TCA-TUS-307 and the surrounding area are within the semidesert grassland vegetation community. Plants observed during the survey include velvet mesquite, snakeweed, desert broom, burroweed, and mixed grasses and forbs. The compound is approximately 0.3 km (0.2 mi) north of Las Moras Wash which is characterized by xeroriparian vegetation. An unnamed water tank is roughly 0.8 km (0.5 mi) northwest of the compound, and an unnamed reservoir is approximately 1.1 km (0.7 mi) to the southwest.

Potential Waters of the U.S. (PWUS)

No PWUS were identified in association with the TCA-TUS-307 compound or proposed ingress/egress routes.

Alternate Tower Locations — TUS Section (TUS)

TCA-TUS-289

TCA-TUS-289 is in southern Pima County within the BANWR approximately 10.7 km (6.7 mi) north of the U.S./Mexico International Border. The compound is at the top of a small hill west of the San Luis Mountains just east of Lopez Wash (Figure 4.14). The approximate elevation is 1,163 m (3,817 ft) amsl. The substrate at the compound is characterized by angular gravel and cobbles with areas of exposed bedrock.

Figure 4.14 Overview of TCA-TUS-289 looking northeast

TCA-TUS-289 is approached via an unpaved road heading south 7.9 km (4.9 mi) from Arivaca Road towards Sufrido tank at which point the road forks east and west. The approach road continues west 1.0 km (0.6 mi) to the junction with the access road. The access road continues south 1.6 km (1.0 mi) before turning west 0.5 km (0.3 mi) to reach the compound (Figure 4.15). Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound and the entire length of the proposed access road.

Survey Results

TCA-TUS-289 and the surrounding area are within the semi-desert grassland vegetation community. Plants observed during the survey include ocotillo, fairy duster, desert broom, wait-a-minute bush, Engelmann's prickly pear, fishhook barrel cactus, cane cholla, and mixed grasses and forbs.

Figure 4.15 TCA-TUS-289 access road looking northeast

Potential Waters of the U.S. at TCA-TUS-289

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	6.0'	Incised channel, cut banks	31.49600	111.46222
A (downstream)	6.0'	Incised channel, cut banks	31.49600	111.46222
B (upstream)	4.0'	Incised channel, cut banks	31.55814	111.46162
B (downstream)	8.0'	Incised channel, vegetation	31.55833	111.46158
C (upstream)	20.0'	Incised channel, vegetation, cut banks	31.55828	111.46108
C (downstream)	18.0'	Incised channel, vegetation, cut banks	31.55833	111.46113
D (upstream)	10.0'	Incised channel, substrate, cut banks	31.56275	111.45702
D (downstream)	8.0'	Incised channel, cut banks	31.56275	111.45706
E (upstream)	3.0'	Incised channel	31.56331	111.45685
E (downstream)	6.0'	Incised channel	31.56333	111.45690
F (upstream)	34.0'	Incised channel, cut bank	31.56776	111.45570
F (downstream)	35.0'	Incised channel, cut bank	31.56778	111.45572
G (upstream)	5.0'	Incised channel	31.56839	111.45578
G (downstream)	11.0'	Incised channel, vegetation, sheet flow	31.56839	111.45583

TCA-TUS-297

TCA-TUS-297 is in southern Pima County within the BANWR approximately 10.0 km (6.3 mi) north of the U.S./Mexico border and 10.3 km (6.4 mi) northeast of Sasabe. The compound is located on a low, flat ridgeline, west of the San Luis Mountains, and east of Lopez Wash (Figure 4.16). The approximate elevation is 1,148 m (3,767 ft) amsl. The substrate at the compound is characterized by angular gravel and scattered rocks and soil is sandy clay loam and fine sand.

Figure 4.16 TCA-TUS-297 from tower compound center looking south

TCA-TUS-297 is approached via Pronghorn Drive which extends southeast from BANWR headquarters. Access is gained via an unpaved road leading to Choffo Tank. The access road continues south-to-southeast along Pronghorn Drive about 2.9 km (1.8 mi) to the compound. Survey coverage for this proposed tower installation included the 0.4 ha (1.0 acre) tower compound and the entire length of the proposed access road (Figure 4.17).

Survey Results

TCA-TUS-297 and the surrounding area are within the semidesert grassland vegetative community. Plants observed during the survey include velvet mesquite, ocotillo, fairy duster, snakeweed, wait-a-minute bush, soaptree yucca, Engelmann's prickly pear, cane cholla, chain-fruit cholla, and mixed grasses and forbs. A raven (*Corvus* sp.) was documented at the compound during the field survey. There were no special status species documented during field surveys.

Figure 4.17 TCA-TUS-297 approach road looking west

The compound is approximately 1.5 km (0.9 mi) east of Lopez Wash, which is characterized by xeroriparian vegetation, considered particularly valuable habitat for a generally higher concentration of species than the surrounding semidesert grassland. Choffo Tank is roughly 0.5 km (0.3 mi) southwest of the compound, and Carpenter Well is 1.6 km (1.0 mi) south. Barrel Cactus Tank is approximately 2.3 km (1.4 mi) west/southwest of the compound, a smaller unnamed stock tank is 2.1 km (1.3 mi) south/southeast, and Sufrido Tank is 2.5 km (1.5 mi) northeast. These features have the capacity to retain surface water, perennially or annually, and provide habitat for aquatic and semi-aquatic species.

Potential Waters of the U.S. at TCA-TUS-297

PWUS ID	OHWM* (ft)	Indicators	Latitude	Longitude
A (upstream)	16.0'	Incised channel, cut banks	31.55626	111.47873
A (downstream)	16.0'	Incised channel, sheet flow	31.55632	111.47871
B (upstream)	41.0'	Incised channel, cut banks, vegetation, exposed roots	31.55607	111.47905
B (downstream)	34.0'	Incised channel, cut banks, exposed roots	31.55607	111.47903

4.0 POTENTIAL TO OCCUR

CBP is preparing an Environmental Assessment for this project that covers an undertaking within the operational region defined as *Tucson West*. This report was prepared to append the Biological Evaluation submitted for this project (HEG 2008). This addendum details the results of a Biological Evaluation of 12 proposed tower locations (10 preferred and two alternates) and their associated ingress and egress routes.

Federal Species

MAMMALS

Arizona Myotis (*Myotis occultus*)

Arizona myotis is known from ponderosa pine (*Pinus ponderosa*) and oak-pine woodlands, riparian forests, and desert areas at elevations ranging from 46 to 2,806 m (150 to 9,200 ft) amsl (AGFD 2003h). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Allen's Big-eared Bat (*Idionycteris phyllotis*)

In Arizona, the Allen's big-eared bat occurs within desertscrub communities through coniferous forests from 403 to 3,225 m (1,320 to 9,800 ft) amsl (AGFD 2001ad). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Big Free-tailed Bat (*Nyctinimops macrotis*)

The big free-tailed bat is widespread throughout Arizona in areas south of the Mogollon Rim at elevations between 552 to 2,585 m (1,810 to 8,475 ft) amsl (AGFD 2002p). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

California Leaf-nosed Bat (*Macrotus californicus*)

The California leaf-nosed bat is known from throughout southwestern Arizona. Habitat for this species is almost exclusively within desertscrub communities, particularly Sonoran and Mohave desertscrub. This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Cave Myotis (*Myotis velifer*)

This species is known throughout much of southern Arizona within habitats ranging from desertscrub through pine-oak communities, between 92 m and 2,684 m (300 to 8,800 ft) amsl (AGFD 2002o). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Greater Western Bonneted Bat (*Eumops perotis californicus*)

The greater western bonneted bat is widespread in Arizona at elevations between 73 m to 2,583 m (240 m to 8,475 ft) amsl (AGFD 2002g). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Jaguar (*Panthera onca*)

The jaguar is known primarily from moist lowlands, savannas or tropical rain forests. Within the northern and southern limits of its range, the jaguar can occur in more arid habitats, particularly in desertscrub through oak-pine woodlands from 1,586 m to 1,739 m (5,200 to 5,700 ft) amsl. This species has the potential to occur at TCA-NGL-285.

Lesser Long-nosed Bat (*Leptonycteris yerbabuenae*)

In Arizona, the lesser long-nosed bat occurs in desertscrub, grassland, and oak woodland habitats from 363 to 2,231 m (1,190 to 7,320 ft) amsl (AGFD 2003v). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Mexican Long-tounged Bat (*Choeronycteris mexicana*)

In Arizona, the Mexican long-tounged bat is known from the Chiricahua Mountains, in the southeastern corner of the state to as far north as the Santa Catalina Mountains, and as far west as the Baboquivari Mountains, from 774 m to 2,233 m (2,540 ft to 7,320 ft) amsl. This species has the potential to occur at TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Mexican Wolf (*Canis lupus baileyi*)

Current habitat for the Mexican wolf in Arizona is within the petran montane and Great Basin conifer forests, plains and Great Basin grasslands, Madrean evergreen woodland, and semidesert grasslands, at elevations from 915 to 3660 m (3,000 to 12,000 ft) amsl (AGFD 2001e). Potential movement corridors for wild populations of Mexican wolf exist from the Baboquivari Mountains in Pima County to the Peloncillo Mountains in southeastern Cochise County (USFWS 2007b). TCA-NGL-285 and TCA-TUS-299 have potential to be within Mexican wolf movement corridors.

Ocelot (*Leopardus pardalis*)

Ocelots occupy a very limited region in the United States within thorn scrub and riparian habitats, typically below 1,219 m (4,000 ft) amsl (AGFD 2004f). Potential movement corridors in Arizona exist from the Baboquivari Mountains in Pima County to the Peloncillo Mountains in southeastern Cochise County (USFWS 2007b). TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307 have the potential to be within ocelot movement corridors.

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

The pale Townsend's big-eared bat is widespread in Arizona and has been documented at elevations between 168 m to 5,272 m (550 ft to 8,437 ft) amsl in desertscrub, oak woodlands, oak/pine, pinyon/juniper, and coniferous forests (AGFD 2003n). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Sonoran Pronghorn (*Antilocapra americana sonoriensis*)

In Arizona, this species is known from the CPNWR, the OPCNM, the Luke Air Force Barry M. Goldwater Gunnery Range (BMGR), and the Tohono O'odham Indian Reservation. Habitat is characterized by broad alluvial valleys separated by block-faulted mountains within the Lower Sonoran Desert life zone. This species has the potential to occur at TCA-AJO-304.

Underwood's Mastiff Bat (*Eumops underwoodi*)

The Underwood's mastiff bat has been documented at four locations near the Baboquivari Mountains, and in the OPCNM in Sonoran desertscrub and semidesert grasslands at elevations ranging from 329 to 1,220 m (1,080 to 4,000 ft) amsl. Due to the rarity of occurrences in Arizona, scant information on habitat requirement is available (AGFD 2003u). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-TUS-287, TCA-TUS-291, TCA-TUS-306, and TCA-TUS-307.

Yellow-nosed Cotton Rat (*Sigmodon ochrognathus*)

The yellow-nosed cotton rat is known from an area bounded by the Baboquivari Mountains to the west, the Santa Catalina mountains to the northwest, the Galiuro Mountains to the north, and the Chiricahua Mountains to the east, from 915 m to 2,593 m (3,000 to 8,500 ft) amsl (AGFD 2003ah). This species has the potential to occur at TCA-AJO-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

BIRDS

Baird's Sparrow (*Ammodramus bairdii*)

In Arizona, the Baird's sparrow is currently known from shortgrass and mixed-grass prairies, open grasslands, fields, deserts, and mixed-oak grasslands, from 1,263 to 1,495 m (4,140 to 4,900 ft) amsl. This species has the potential to occur at TCA-NGL-285.

Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*)

In the project area, the cactus ferruginous pygmy-owl is known from the OPCNM and the Altar Valley east of the Baboquivari Mountains. Suitable habitat includes Sonoran riparian and xeroriparian communities and adjacent mesquite bosques where large paloverde, ironwood, and saguaro occur from 397 m to 1,220 m (1,300 ft to 4,000 ft) (AGFD 2001y). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike is known from areas of low vegetation with scattered trees and shrubs, from desertscrub habitats to open woodlands (AGFD 2004e). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Masked Bobwhite Quail (*Colinus virginianus ridgewayi*)

Within Arizona, the masked bobwhite quail is currently known from the Buenos Aires National Wildlife Refuge in Altar Valley. Habitat for this species includes areas of open grasslands, desertscrub, desert grasslands, and forb-rich plains, at elevations from 10 to 1,200 m (33 to 3,937 ft) amsl. (AGFD 2001i) This species has the potential to occur at TCA-TUS-287, TCA-TUS-289, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Western Burrowing Owl (*Athene cunicularia hypugaea*)

The western burrowing owl occurs in localized populations throughout much of southern Arizona in open grasslands, steppes, deserts, prairies, agricultural lands, vacant lots, golf courses, and airports from 198 m to 1,873 m (650 ft to 6,140 ft) amsl (AGFD 2001d). This subspecies has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

AMPHIBIANS and REPTILES

Canyon Giant Spotted Whiptail (*Aspidoscelis burti stictogrammus*)

Within the project area, the canyon giant spotted whiptail is known from the Santa Catalina, Santa Rita, Baboquivari, and Pajarito Mountains, in dense shrubby vegetation, from sea level to 1,370 m (0 to 4,500 ft) amsl (AGFD 2001c). This subspecies was observed on the proposed access road for TCA-TUS-298, and has the potential to occur at TCA-NGL-285, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

Chiricahua Leopard Frog (*Rana chiricahuensis*)

Leopard frogs are habitat generalists and historically occupied a wide variety of aquatic habitats. This species is now limited to small permanent and semi-permanent aquatic reaches containing few non-native predators in oak, mixed oak, pine woodlands, chaparral, grasslands, cienegas, and desert habitats (AGFD 2006e). This species has the potential to occur at TCA-TUS-287 and TCA-TUS-297.

Lowland Leopard Frog (*Rana yavapaiensis*)

In Arizona, the lowland leopard frog is known to occur in aquatic systems in habitats ranging from desert grasslands to pinyon-juniper vegetative communities from 146 to 2,499 m (480 to 8,200 ft) amsl (AGFD 2006h). This species has the potential to occur at TCA-TUS-287 and TCA-TUS-297.

Mexican Rosy Boa (*Charina trivirgata trivirgata*)

In Arizona, the Mexican rosy boa is known from the OPCNM, and the Maricopa Mountains. Suitable habitat for this species includes arid desertscrub communities between 445 to 854 meters (1,460 2,800 feet) amsl. This species has the potential to occur at TCA-AJO-304 and TCA-AJO-305.

Sonoran Desert Tortoise (*Gopherus agassizii*)

The Sonoran populations of desert tortoises are known from areas south and east of the Colorado River within desertscrub and semidesert grassland communities from 155 to 1,615 m (510 ft to 5,300 ft) amsl (AGFD 2001aa). This species has the potential to occur at TCA-AJO-304, TCA-AJO-305, TCA-NGL-285, TCA-TUS-287, TCA-TUS-289, TCA-TUS-290, TCA-TUS-291, TCA-TUS-297, TCA-TUS-298, TCA-TUS-299, TCA-TUS-306, and TCA-TUS-307.

PLANTS

Pima Pineapple Cactus (*Coryphantha scheeri robustispina*)

The range of the Pima pineapple cactus in Arizona includes areas in eastern Pima County and parts of Santa Cruz County. This species has been documented from 701 to 1,524 m (2,300 to 5,000 ft) amsl in mesquite shrub communities, grassland shrub communities, and creosotebush flats.

The Pima pineapple cactus was identified during field surveys at TCA-TUS-290 and has the potential to also occur at TCA-TUS-287, TCA-TUS-289, TCA-TUS-297, TCA-TUS-298, and TCA-TUS-299 or along associated routes.

Santa Cruz Striped Agave (*Agave parviflora parviflora*)

The Santa Cruz striped agave is known from Pima County and Santa Cruz County in desert grasslands and oak woodlands from 1,086 m to 1,586 m (3,560 ft to 5,200 ft) amsl (AGFD 2003c2). This subspecies was identified during field surveys at the proposed tower compounds for TCA-TUS-287 and TCA-TUS-289.

Other Special Status Species

Common Name	Scientific Name	BLM Status	USFS Status	State Status	TCA-TUS-287	TCA-TUS-289	TCA-TUS-290	TCA-TUS-291	TCA-TUS-297	TCA-TUS-298	TCA-TUS-299
Mammals											
Hoary Bat	*Lasiurus cinereus*		S							*	
Pocketed Free-tailed Bat	*Nyctinimops femorosaccus*	S									
Western Red Bat	*Lasiurus blossevillii*			WSC			*				
Western Yellow Bat	*Lasiurus xanthinus*			WSC			*				
Birds											
Black-bellied Whistling Duck	*Dendrocygna autumnalis*			WSC							
Black-capped Gnatcatcher	*Polioptila nigriceps*			WSC			*				
Common Black Hawk	*Buteogallus anthracinus*			WSC							
Crested Caracara	*Caracara cheriway*			WSC	*	*			*	*	*
Elegant Trogon	*Trogon elegans*			WSC							
Northern Gray Hawk	*Buteo nitidus maximus*	S	S								
Osprey	*Pandion haliaetus*			WSC							
Rose-throated Becard	*Pachyramphus aglaiae*			WSC			*				
Thick-billed Kingbird	*Tyrannus crassirostris*			WSC							
Tropical Kingbird	*Tyrannus melancholicus*			WSC			*				
Amphibians & Reptiles											
Ajo Mountain Whipsnake	*Masticophis bilineatus lineolatus*		S								
Brown Vinesnake	*Oxybelis aeneus*			WSC							
Great Plains Narrow-mouthed Toad	*Gastrophryne olivacea*			WSC	*	*	*	*	*	*	*
Lowland Burrowing Treefrog	*Pternohyla fodiens*			WSC							
Maricopa Leaf-nosed Snake	*Phyllorhynchus browni lucidus*		S								
Organ Pipe Shovel-nosed Snake	*Chionactis palarostris organica*		S								
Tucson Shovel-nosed Snake	*Chionactis occipitalis klauberi*	S									
Western Barking Frog	*Eleutherodactylus augusti cactorum*		S	WSC							
Invertebrates											
Arizona Giant Skipper	*Agathymus aryxna*		S								
Arizona Metalmark	*Calephelis rawsoni arizonensi*		S							*	
Chiricahua Pine White	*Neophasia terlooii*		S								
Felder's Orange Tip	*Anthocharis cethura*		S							*	
Neumogen's Giant Skipper	*Agathymus neumogeni*		S							*	
Obsolete Viceroy Butterfly	*Limenitis archippus obsolete*		S							*	
Poling's Giant Skipper	*Agathymus polingi*		S							*	
Scudder's Dusky Wing	*Erynnis scudderi*		S							*	

Common Name	Scientific Name	BLM Status	USFS Status	State Status	Seasonal Occurrence	TCA-TUS-287	TCA-TUS-289	TCA-TUS-290	TCA-TUS-291	TCA-TUS-297	TCA-TUS-298	TCA-TUS-299
Plants												
Sedge	*Carex chihuahuensis*		S		Perennial							
Ajo Rock Daisy	*Perityle ajoensis*			SR	Perennial							
Aravaipa Wood Fern	*Thelypteris puberula sorensis*	S			Perennial							
Arid Throne Fleabane	*Erigeron arisolius*		S		Annual							
Arizona Manihot	*Manihot davisiae*		S		Perennial							
Arizona Passionflower	*Passiflora arizonica*		S		Perennial							
Arizona Soran Rosewood	*Vauquelinia californica sorensis*	S			Perennial							
Blue Sand Lily	*Triteleiopsis palmeri*	S		SR	Perennial							
Box Canyon Muhly	*Muhlenbergia dubioides*		S		Perennial							
Broad-leaf Ground-cherry	*Physalis latiphysa*		S		Annual							
Broadleaf Twayblade	*Listera convallarioides*			SR	Perennial							
Cactus Apple	*Opuntia englemannii flavispina*			SR	Perennial							
Catalina Beardtoungue	*Penstemon discolor*		S	HS	Perennial							
Chihuahuan Stickseed	*Hackelia ursina*		S		Perennial							
Chiltepin	*Capsicum annuum glabriusculum*		S		Perennial							
Chiricahua Mountain Brookweed	*Samolus vagans*		S		Perennial							
Chisos Mountains Coralroot	*Hexalectris revoluta*	S	S	SR	Perennial							
Counter-clockwise Fishhook Cactus	*Mammalaria mainiae*		S	SR	Perennial							
Coville Bundleflower	*Desmanthus covillei*		S		Perennial							
Crested Coral Root	*Hexalectris spicata*			SR	Perennial							
Dahlia Rooted Cereus	*Peniocereus striatus*			SR	Perennial							
Dalhouse Spleenwort	*Asplenium dalhousiae*	S			Perennial							
Blue-eyed Grass	*Sisyrinchium cernuum*		S		Perennial							
Desert Night-blooming Cereus	*Peniocereus greggii transmontanus*			SR	Perennial							

Common Name	Scientific Name	BLM Status	USFS Status	State Status	Seasonal Occurrence	TCA-TUS-287	TCA-TUS-289	TCA-TUS-290	TCA-TUS-291	TCA-TUS-297	TCA-TUS-298	TCA-TUS-299
Emory's Barrel Cactus	*Ferocactus emoryi*			SR	Perennial							
Fallen Ladie's Tresses	*Schiedeella arizonica*			SR	Perennial							
Giant Sedge	*Carex ultra*	S	S		Perennial							
Golden Barrel Cactus	*Ferocactus cylindraceus eastwoodiae*			SR	Perennial							
Heathleaf Wild Buckwheat	*Eriogonum ericifolium ericifolium*		S		Perennial							
Huachuca Mountain Lupine	*Lupinus huachucanus*		S		Perennial							
Kelvin Cholla	*Opuntia x kelvinensis*			SR	Perennial							
Kofa Barberry	*Berberis harrisoniana*	S			Perennial							
Lemmon Milkweed	*Asclepias lemmonii*		S		Perennial							
Lemmon's Stevia	*Stevia lemmonii*		S		Perennial							
Lumholtz Nightshade	*Solanum lumholtzianum*		S		Annual						*	
Magenta-flower Hedgehog-cactus	*Echicereus fasciculatus*			SR	Perennial							
Mexican Broomspurge	*Euphorbia gracillima*		S		Annual						*	
Mock Pennyroyal	*Hedeoma dentatum*		S		Perennial							
Organ Pipe Cactus	*Stenocereus thurberi*			SR	Perennial							
Plummer Onion	*Allium plummerae*			SR	Perennial							
Sand Pedro River Wild Buckwheat	*Eriogonum terrenatum*	S			Perennial							
Seeman Groundsel	*Senecio carlomasonii*		S		Perennial							
Senita	*Lophocereus schottii*			SR	Perennial							
Shade Violet	*Viola umbraticola*		S		Perennial							
Slender Adder's Mouth	*Malaxis tenuis*			SR	Perennial							
Slender Needle Corycactus	*Corypantha sheeri valida*			SR	Perennial						O	
Soran Milkweed Vine	*Matelea cordifolia*		S		Perennial							
Soran seburn	*Tragia laciniata*		S		Perennial							
Sparseleaf Hermannia	*Hermannia pauciflora*		S		Perennial							
Stag-horn Cholla	*Opuntia versicolor*			SR	Perennial	O		O	O		O	O
Superb Beardtoungue	*Penstemon superbus*		S		Perennial							

Common Name	Scientific Name	BLM Status	USFS Status	State Status	Seasonal Occurrence	TCA-TUS-287	TCA-TUS-289	TCA-TUS-290	TCA-TUS-291	TCA-TUS-297	TCA-TUS-298	TCA-TUS-299
Sweet Acacia	*Acacia farnesiana*		S		Perennial							
Thornber Fishhook Cactus	*Mammalaria thornberi*			SR	Perennial							
Thurber Hoary Pea	*Tephrosia thurberi*		S		Perennial							
Thurber Indian Mallow	*Abutilon thurberi*			SR	Annual							
Thurber's Bog Orchid	*Platanthera limosa*			SR	Perennial							
Tucson Mountain Spiderling	*Boerhavia megaptera*	S			Annual							
Tumamoc Globeberry	*Tumamoca macdouglii*	S		SR	Perennial							
Varied Fishhook Cactus	*Mammalaria viridiflora*			SR	Perennial							
Weeping Muhly	*Muhlenbergia xerophila*		S		Perennial							
Whisk Fern	*Psilotum nudum*			HS	Perennial							

Common Name	Scientific Name	BLM Status	USFS Status	State Status	TCA-NGL-285	TCA-AJO-304	TCA-AJO-305	TCA-TUS-306	TCA-TUS-307
Amphibians									
Great Plains Narrow-mouthed Toad	*Gastrophryne olivacea*			WSC	*	*	*	*	*
Lowland Burrowing Treefrog	*Pternohyla fodiens*			WSC					
Western Barking Frog	*Eleutherodactylus augusti cactorum*		S	WSC					
Birds									
Black-bellied Whistling Duck	*Dendrocygna autumnalis*			WSC					
Black-capped Gnatcatcher	*Polioptila nigriceps*			WSC	*				
Common Black Hawk	*Buteogallus anthracinus*		S	WSC					
Crested Caracara	*Caracara cheriway*			WSC				*	*
Elegant Trogon	*Trogon elegans*			WSC					
Osprey	*Pandion haliaetus*			WSC					
Rose-throated Becard	*Pachyramphus aglaiae*			WSC				*	*
Thick-billed Kingbird	*Tyrannus crassirostris*			WSC					
Tropical Kingbird	*Tyrannus melancholicus*			WSC	*	*	*	*	*
Mammals									
Western Red Bat	*Lasiurus blossevillii*			WSC					
Western Yellow Bat	*Lasiurus xanthinus*			WSC					
Reptiles									
Brown Vinesnake	*Oxybelis aeneus*			WSC					

Common Name	Scientific Name	BLM Status	USFS Status	State Status	Seasonal Occurrence	TCA-NGL-285	TCA-AJO-304	TCA-AJO-305	TCA-TUS-306	TCA-TUS-307
Plants										
Ajo Rock Daisy	*Perityle ajoensis*			SR	Perennial					
Blue Sand Lily	*Triteleiopsis palmeri*	S		SR	Perennial					
Broadleaf Twayblade	*Listera convallarioides*			SR	Perennial					
Cactus Apple	*Opuntia englemannii flavispina*			SR	Perennial					
Catalina Beardtoungue	*Penstemon discolor*		S	HS	Perennial					
Chisos Coral Root	*Hexalectris revoluta*	S	S	SR	Perennial					
Counter-clockwise Fishhook Cactus	*Mammalaria mainiae*		S	SR	Perennial					
Crested Coral Root	*Hexalectris spicata*			SR	Perennial					
Dahlia Rooted Cereus	*Peniocereus striatus*			SR	Perennial					
Desert Night-blooming Cereus	*Peniocereus greggii transmontanus*			SR	Perennial					
Emory's Barrel Cactus	*Ferocactus emoryi*			SR	Perennial					
Fallen Ladie's Tresses	*Schiedeella arizonica*			SR	Perennial					
Golden Barrel Cactus	*Ferocactus cylindraceus eastwoodiae*			SR	Perennial					
Kelvin Cholla	*Opuntia x kelvinensis*			SR	Perennial					
Littleleaf False Tamarind	*Lysiloma watsonii*			SR	Perennial					
Magenta-flower Hedgehog-cactus	*Echinocereus fasciculatus*			SR	Perennial					
Organ Pipe Cactus	*Stenocereus thurberi*			SR	Perennial		O			
Plummer Onion	*Allium plummerae*			SR	Perennial					
Senita	*Lophocereus schottii*			SR	Perennial					
Slender Adder's Mouth	*Malaxis tenuis*			SR	Perennial					
Staghorn Cholla	*Opuntia versicolor*			SR	Perennial		O			
Thornber Fishhook Cactus	*Mammalaria thornberi*			SR	Perennial					
Thurber Indian Mallow	*Abutilon thurberi*			SR	Perennial					
Thurber's Bog Orchid	*Platanthera limosa*			SR	Perennial					
Tumamoc Globeberry	*Tumamoca macdouglii*	S	S	SR	Perennial					
Varied Fishhook Cactus	*Mammalaria viridiflora*			SR	Perennial					
Whisk Fern	*Psilotum nudum*			HS	Perennial					

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