United States Department of the Interior

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In Reply Refer to:
AESO/SE
22410-F-2009-0089
22410-1989-0078-R6

December 10, 2009

Mr. James Riordan
SBI*net* Executive Program Director
Customs and Border Protection
U.S. Department of Homeland Security
1901 South Bell Street, 7th floor, Room 716
Arlington, VA 20598

RE: Biological Opinion on SBI*net* Ajo-1 Tower Project, Ajo Area of Responsibility, U.S. Border Patrol, Tucson Sector, Arizona

Dear Mr. James Riordan:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated August 7, 2009, and received by us on August 14. At issue are impacts that may result from the proposed SBI*net* Ajo-1 Tower Project located in Pima County, Arizona. The proposed action may affect Sonoran pronghorn (*Antilocapra americana sonoriensis*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), and the desert (Quitobaquito) pupfish (*Cyprinodon* [*macularis*] *eremus*).

Additionally, you requested reinitiation of consultation on the General Management Plan (GMP) for Organ Pipe Cactus National Monument (OPCNM) (consultation number 22410-1989-0078), on behalf of the Superintendent of OPCNM. At issue are the impacts to the endangered Sonoran pronghorn. See the GMP for effects analyses and conclusions regarding other listed species. You found that only the Sonoran pronghorn would be affected by the proposed change in the GMP; hence our previous analyses and conclusions stand for those species. One of the conservation measures in our November 16, 2001 biological opinion on the GMP and all subsequent reinitiations is: "Limiting future development to the area south of the North Puerto Blanco Drive and east of the Senita Basin Road/Baker Mine Trail/Dripping Springs Trail and limiting timing of construction to occur outside the pronghorn fawning period (March 15 to July 15)". Among other proposed actions, the current consultation addresses a proposed one time deviation from the first part of this conservation measure in order to allow DHS to construct towers TCA-AJO-170, 302, and 003 and associated access roads outside of the aforementioned area. OPCNM will be issuing a Special Use Permit for the construction of these and other towers (as described in the proposed action) only on OPCNM lands; however as the lead action

agency, DHS is consulting on the entire action. Herein we revise the proposed action for the GMP to reflect this one time deviation from the limitation on future development, and furthermore revise the effects of the action and conclusion for the Sonoran pronghorn and lesser long-nosed bat in OPCNM's GMP biological opinion to reflect this change in the proposed action. Sections not addressed or revised herein remain as presented in that biological opinion and its reinitiations.

This biological opinion is based on information provided in the final biological assessment, electronic mail correspondence, letters, telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern; construction, operation, and maintenance of towers and associated infrastructure; and U.S. Border Patrol activities, and effects of those activities, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

- June 26, 1997: We issued a biological opinion on OPCNM's GMP.
- November 16, 2001: We issued a reinitiated biological opinion (R1) on OPCNM's GMP that included a number of conservation measures for Sonoran pronghorn in the Description of Proposed Action, including the one addressed in this biological opinion.
- April 7, 2003: We issued a reinitiated biological opinion (R2) on OPCNM's GMP.
- March 10, 2005: We issued a reinitiated biological opinion (R3) on OPCNM's GMP.
- August 23, 2005: We issued a reinitiated biological opinion (R4) on OPCNM's GMP.
- March 8, 2007: We issued a reinitiated biological opinion (R5) on OPCNM's GMP.
- October 16, 2008: We (Arizona Ecological Services Office - AESO), met with various representatives of the Department of the Interior (DOI), including the FWS, National Park Service (NPS), and Bureau of Land Management (BLM); and the Department of Homeland Security (DHS) to discuss the Ajo 1 project and the "Structured Coordination Process" (formerly "Expedited Consultation Process").
- October 17, 2008 through December 2009: AESO, DOI, DHS, and Gulf South Research Corporation (GSRC – DHS's environmental consultant for the project) corresponded by telephone and electronic mail regarding the proposed project.
- October 23, 2008: AESO, DOI, and DHS conducted a site visit to assess and discuss potential project impacts to Sonoran pronghorn and lesser long-nosed bats and recommendations to reduce those impacts.
- December 2 - 4, 2008: AESO, DOI, and DHS visited the Playas Tower Test Facility in New Mexico (December 2) and held a project meeting/site visit (December 4) to, among other items, further discuss potential project impacts to Sonoran pronghorn and lesser long-nosed bats and recommendations to reduce those impacts.

- December 23, 2008: In response to your verbal request for input regarding the proposed project, we sent you a letter that briefly described the effects of the proposed project, as we understood it at the time, to Sonoran pronghorn and lesser long-nosed bats, as well as recommended measures to avoid, minimize, and offset effects to those species.
- February 20, 2009: We received DHS' February 17, 2009, letter, in response to our December 23, 2008, letter.
- February 26, 2009: AESO, DOI, and DHS met to work toward resolving outstanding Ajo 1 project issues concerning endangered species.
- April 13, 2009: We received (via electronic mail) the draft Description of the Proposed Action (DPA) for review and comment.
- April 20, 2009: We sent (via electronic mail) you comments on the draft DPA.
- May 19, 2009: We received (via electronic mail) the revised draft DPA for review and comment.
- May 29, 2009: We sent (via electronic mail) you comments on the revised draft DPA.
- June 10, 2009: AESO, DOI, and DHS (primarily Executive level staff) met in Denver to work toward resolving outstanding issues regarding the proposed project.
- June 15, 2009: AESO and DHS (specifically, U.S. Customs and Border Protection [CBP]-U.S. Border Patrol [USBP]) met to resolve issues regarding U.S. Border Patrol operations associated with the proposed project.
- July 10, 2009: We received (via electronic mail) the revised draft DPA for review and comment.
- July 15, 2009: We sent (via electronic mail) you comments on the draft DPA.
- July 21, 2009: AESO, DOI, and DHS had a conference call to address DOI comments on the DPA and resolve outstanding concerns regarding endangered species and other resource issues.
- July 24, 2009: FWS-Region 2 Director and DHS met to discuss outstanding issues and schedule for the proposed project.
- July 24, 2009: We received (via electronic mail) the updated DPA and comment matrix for review and comment.
- July 29, 2009: We sent (via electronic mail) you comments on the updated DPA and comment matrix.
- August 14, 2009: We received the draft Biological Assessment and request for formal consultation.
- September 15, 2009: We received an updated draft Biological Assessment.
- September 22, 2009: We sent this draft BO to DHS.

- September 28: We received your letter of formal commitment to fund conservation measures totaling $4,253,000 in association with the SBI*net* Ajo 1 Tower Project. Your letter stated these funds will be transferred within 120 days (i.e., by January 26, 2010). You also committed to an additional $17,000 for cultural resource surveys at two proposed Sonoran pronghorn forage enhancement sites on BLM lands. September 30, 2009: We received your comments on the draft BO.
- October 1, 2, 7, 13, 15, 15, 20, 22, and 29, 2009: We held conference calls with you to discuss your comments on the draft BO.
- November 4, 2009: We received an electronic mail from you informing us of your plans to conduct some Ajo 1 Tower work and testing during the Sonoran pronghorn fawning season.
- November 9 – December 4, 2009: We held a number of conference calls, participated in a meeting on December 3, 2009, and exchanged electronic emails with you to discuss the proposed work during the fawning season and develop and finalize additional measures to avoid and minimize impacts from the proposed work to Sonoran pronghorn during the fawning season.
- December 2, 2009: Based on information received from OPCNM and conversations with CBP we formally consulted on Quitobaquito pupfish in this biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The DHS proposes to implement the SBI*net* Ajo-1 Tower Project in the Ajo Station's Area of Responsibility (AOR) of USBP-Tucson Sector, Arizona. This project includes the following components: construct, operate, and maintain communication and sensor towers; construct, use, and maintain new associated access roads; repair, improve, use, and maintain associated approach roads; conduct USBP operations, including relocating and operating a forward operating base (FOB); and implement conservation measures for endangered species.

Additionally, the proposed action includes associated DOI agency approval actions including the issuance of a right-of-way (ROW) grant by BLM; issuance of a Special Use Permit by the FWS-Cabeza Prieta National Wildlife Refuge (CPNWR); and issuance of a Special Use Permit by OPCNM. Specifically, OPCNM will issue a Special Use Permit to DHS for the construction of towers and associated roads for the purpose of constructing the towers on OPCNM (towers TCA-AJO- 003, 170, 204, 302,303, and 310 only). Arizona State Land Department (ASLD) will issue a Special Land Use Permit (SLUP) for the construction of the tower site AJO-310 and associated road improvements on Arizona State Trust Land. CPNWR will issue a Special Use Permit to DHS for the construction, maintenance, and access to tower TCA-AJO-189 on CPNWR. BLM will issue a ROW grant for the construction and maintenance tower TCA-AJO-004 and 216 and construction, repair, improvements, and maintenance of access roads associated with these towers on BLM lands.

Furthermore, as described previously, this consultation addresses reinitiation of Section 7 consultation on the OPCNM GMP to allow for a one-time deviation from the first part of a conservation measure ("Limiting future development to the area south of the North Puerto Blanco Drive and east of the Senita Basin Road/Baker Mine Trail/Dripping Springs Trail and limiting timing of construction to occur outside the pronghorn fawning period [March 15 to July 15]") included in the November 16, 2001 GMP biological opinion, to allow DHS to construct towers TCA-AJO-170, 302, and 003 and associated access roads. The construction of these towers and roads is described below.

The proposed project is located within OPCNM, CPNWR, BLM and Arizona State Trust lands in southwestern Pima County, Arizona (Figure 1) (the Action Area [Figure 2], which differs from the project area, is described below in the Environmental Baseline section).

The SBI*net* Ajo-1 Tower Project represents a stand-alone system of sensors and communication technology and does not dictate the future placement of towers in adjacent areas. However, once each of the independent SBI*net* projects is complete and operational, the entire border region could be integrated into a single common operating picture (COP). The complete proposed action, summarized below, is described in detail in the final BA, as well as letters and electronic mail correspondence from DHS (including CBP and USBP) and their representatives, GSRC, OPCNM, CPNWR, and BLM to FWS, and notes from conference calls with DHS (including CBP and USBP) and their representatives, GSRC, OPCNM, CPNWR, and BLM.

Secure Border Initiative (SBI) is a comprehensive, multi-year plan established by DHS in November 2005 to secure the United States (U.S.) borders and reduce illegal immigration. SBI*net* is the component of SBI responsible for the development, installation, and integration of technological solutions. SBI*net* will improve deterrence, detection, and apprehension of cross border violators (CBV) entering or attempting to enter the U.S. When fully implemented, SBI*net* and SBI Tactical Infrastructure will improve the ability of CBP personnel to rapidly and effectively respond to CBV activity and help DHS and CBP to manage, control, and secure the Nation's borders.

More specifically, the proposed action is to construct, operate, and maintain ten fixed communication and sensor towers (Figures 1, 2, 3, and 4); construct new roads (1.27 linear miles); repair four authorized roads (3.9 linear miles) and one authorized corridor (4.4 linear miles); improve four authorized roads (0.22 linear mile) and one authorized corridor (1.7 linear miles) (see Appendix B in the BA for access and approach road maps); maintain access and approach roads (38.2 linear miles, see Figure 4); deploy two of the ten towers (TCA-AJO-189 and 204) with the use of a helicopter; conduct USBP operations within the project area (Figure 1), including relocating and operating a FOB; and implement conservation measures to avoid, minimize, and offset effects to endangered species and other DOI trust resources. Relocating the FOB was not part of the original proposed action. CBP agreed to this at the request of the FWS

as a measure to offset effects to Sonoran pronghorn. A total of 11 towers will be built as part of the SBI*net* Ajo-1 Tower Project. However, TCA-AJO-305, was previously addressed in the Section 7 consultation for the SBI*net* Tucson West Tower Project and, therefore, is not included as part of this consultation.

Towers

Sensor towers are designed to detect CBV activity whereas communication towers are designed to relay information to a CBP control room. Towers will typically range in height from 30 feet up to 180 feet (see Appendix C of the BA for a detailed description of each tower). Depending on the local terrain, components (i.e., antennae) will be mounted on each tower between 20 to 120 feet above ground level. The exact number and type of equipment will depend on the number and types of cameras, sensors, and radios used; the area to be monitored, and other design variables. Three tower designs are proposed and include: self standing towers (SST), rapidly deployed towers (RDT), and remote access towers (RAT).

Tower Footprint

At a maximum, construction of RDT and SST tower sites will result in ground disturbance within a 100- x 100-foot footprint centered on the tower location. RAT towers will result in ground disturbance within a 35- x 35-foot footprint centered on the tower location. The permanent tower site footprint (located within the 100- x 100-foot footprint) will typically be 50- x 50-feet for RDT towers, 80- x 80-feet for SST towers, and 14- x 14-feet for RAT towers. The tower footprint will adhere to these dimensions unless otherwise noted in Appendix C of the BA. For example, TCA-AJO-170 will have a permanent tower site (including perimeter fence) footprint of 93.5 x 30-feet per OPCNM requirements.

Tower Perimeter Fence Enclosure

The fence surrounding each SST and RDT tower will be 80- x 80-feet x 8-feet high and 50- x 50-feet x 8-feet high chainlink, respectively. Some will have three strands of barbed wire at the top of the perimeter security fence enclosure surrounding the tower and its associated equipment shelter (barbed wire will <u>not</u> be installed on the perimeter fences at TCA-AJO-003, 170, 204, 216, 303, and 310 per DOI's recommendations). RAT towers will have a 35- x 35-foot x 12-foot high chainlink perimeter fence. Perimeter fence will not be constructed at TCA-AJO-189 per DOI's recommendations. Perimeter fence footprint will be confined to dimensions previously stated for each tower site unless otherwise noted in Appendix C of the BA.

Tower Equipment Shelter

A 10- x 12-foot equipment shelter will be placed within the perimeter fencing of each proposed tower site. Each shelter will be equipped with an air blower and air conditioning system; the air blower will operate during normal tower operation, and the air conditioning unit will operate when interior temperatures exceed 120 degrees Fahrenheit (expected to be less than 100 days per year).

Tower Power Sources
All towers will operate from a battery system and the batteries will be recharged by commercial grid power, hybrid propane generator/solar system, or solar system. Power to TCA-AJO-170, 204, 216, and 301 will be provided from commercial grid power with a propane fueled backup generator. For maintenance purposes, backup generators will be operated for no more than one hour twice per month. However, if grid power is interrupted, generators will temporarily be operated as needed until grid power is again available. Power lines to TCA-AJO-170, 204, 216, and 301 will be installed overhead from the main trunk line to the tower site. The length of the overhead power lines from the main trunk line to the tower compounds will be approximately 65 feet. Lines will be placed within surveyed road construction buffer areas, all of which will be verified to identify potential impacts to biological and cultural resources along access roads.

Power to the remaining towers (TCA-AJO-004, 003, 302, 303, and 310), with the exception of 189, will be provided from a hybrid propane 35 kilowatt generator/solar system. Generators will be operated twice per day for up to 2 to 4 hours for each start. A 1,000 gallon propane fuel tank will be located at these tower sites. Power to TCA-AJO-189 will be provided from a solar system only.

Generators for both of the aforementioned systems will be housed within an enclosure equipped with noise baffles and will have a spill containment basin with a volume of five times that of the total engine fluids. Noise emissions from the propane generator and shelter air conditioning system were measured at 59 A-weighted decibels (dBA) at approximately 45 feet from the generator's radiator under standard test conditions. This means that at approximately 492 feet from the generator's radiator, noise levels attenuated to 37.4 dBA. However, SBI*net* will further attenuate noise levels to 35 dBA at approximately 492 feet. The solution for attenuating noise levels from generators associated with tower operations will be implemented during tower deployment (before project construction is completed). DHS will coordinate with the land managers during this process and will provide a report to land managers and FWS-AESO via electronic mail within two weeks of tower deployment completion that describes the method(s) used to achieve the required noise level and includes the noise level testing results.

Tower Lighting
All proposed towers will have infrared lighting installed for aviation safety and lighting. Additionally, all proposed tower sites, with the exception of TCA-AJO-189 and 204, will be lighted for security purposes. Lighting will consist of a porch light on the tower shelter and would be controlled by a motion detector. The light will be shielded to avoid illumination outside the footprint of the tower site, and low sodium bulbs will be used. None of the towers will be constructed at heights greater than 180 feet; therefore, Federal Aviation Administration lighting requirements do not apply to the proposed project.

Communication and Sensor Tower Construction
RDTs and SSTs
The permanent tower footprints (50- x 50-feet or 80- x 80-feet) will be mechanically cleared of vegetation and graded for the construction of RDT and SST sites, respectively. Precast concrete pads will be installed for the equipment shelter foundation, propane gas tank foundation, and generator foundation. The buffer site (area between the permanent footprint and the maximum area of temporary disturbance around the tower [100- x 100-feet] may be cleared but will not be graded. During construction, all staging of construction equipment and material, if necessary, will occur within the buffer site. Any vehicle parking outside the 100- x 100-foot footprint will be at parking areas identified and approved by the land manager. The number of vehicles driven to the proposed tower sites during construction will be minimized.

The following heavy equipment and vehicles are expected to be used during each phase of tower construction:

1) Civil Phase (Installation of tower, shelter, generator, etc.):
Front-end loader or equivalent (1); Drill Rig (1); Excavator (1); Water truck (1); Crane (1); Bulldozer (1, as needed); Dump trucks (up to 3, as needed); and Flatbed delivery truck (up to 3 and trailers). The type of truck required varies with site conditions and material needs (i.e., shelter, tower, LP tanks, solar panels, microwave dishes, etc.).

2) Fence and Parking Area Construction Phase:
Small Excavator (1); Post pole digger (1); and Crew trucks (approximately 6)

3) Tower Site Construction Check-out Phase:
Crew trucks (approximately 8)

4) Sensor Installation Phase:
Crew trucks (approximately 6)

5) Integrated Site Functional Check-out Phase:
Crew trucks (approximately 3)

6) Radar Characterization and System Checkout Phase:
Crew trucks (approximately 4)

7) System Acceptance Test Phase:
Crew trucks (approximately 4)

8) Site Security (Total period of performance):
Crew trucks (approximately 1)

RATs

The permanent RAT footprint (14- x 14-foot) will be cleared, graded, and leveled. Vegetation in temporary construction buffer (maximum of 35- x 35-feet) will be removed if required for construction purposes. Towers TCA-AJO-189 and 204 will be deployed with the use of helicopters. The proposal for helicopter operations is described below. CBP, however, is currently evaluating alternate lift sites to reduce the length of helicopter flights and use of a larger helicopter to minimize the number of helicopter lifts required for personnel. CBP will coordinate with land managers and FWS-AESO to reduce helicopter lifts to the absolute minimum number required for construction.

Currently, a Kaman K-Max helicopter with a lift capacity of 6,000 pounds is proposed to transport construction materials, equipment, and supplies; and a Bell Jet Ranger helicopter (1,000 pound payload) is proposed to transport construction and biological monitoring personnel. Helicopter lift locations will be at the Ajo airport for TCA-AJO-189 and the Tiger Pit on OPCNM for TCA-AJO-204. A 5-week build cycle is anticipated for each proposed RAT tower site. CBP estimates that construction of towers TCA-AJO-204 and 189 will require up to 22 total lifts for equipment and materials per tower and that additionally, TCA-AJO-189 will require about 63 total lifts for personnel during the build cycle. Thus, a total of up to 85 total lifts will be required to construct proposed tower TCA-AJO-189 and up to 22 lifts will be required to construct proposed tower TCA-AJO-204.

To minimize impacts to pronghorn, CBP will follow a helicopter ingress/egress route to TCA-AJO-189 that avoids or minimizes flight activity in pronghorn habitat as specified by CPNWR. For access to TCA-AJO-204, DHS will avoid helicopter flights (sling-loading or lifting people) west of Twin Peaks or more than 0.25 mile north of the "Tiger Cage" landing/staging zone, as pronghorn are frequently detected between the Puerto Blanco Mountains and Highway 85 which is immediately north of the Tiger Cage. A variety of equipment and power tools will be used during the construction of RAT towers, including a small excavator or Bobcat type equipment, air compressor, jack hammer, portable generator, small rock drill rig, electric drill, electric grinder, electric saw, and jumping jack.

Timing of Tower Construction and Testing

The total time for all phases of construction (excluding the testing phases), for each proposed tower site is expected to be approximately 26 to 80 days, depending on the tower type, and will occur during daylight hours. Generally, RDTs will require up to 40 days, SSTs will require up to 80 days (this includes a 28 day concrete set) and RATS will require up to 26 days to be constructed. Tower construction will occur during daylight hours, and vehicle traffic will be minimized to the greatest extent possible during tower construction. Following the completion of tower infrastructure construction, testing will be conducted to check the functionality and performance of the sensor and communication system. Testing will include activities conducted in the COP as well as ground activities conducted in the field. All phases of tower testing in the field will take up to 80 days (this includes: Sensor Acceptance Test [SAT] Procedure,

Communication Acceptance Test Procedure, Site Functional Checkout, Unattended Ground Sensor Testing, Tower Characterization, SAT Dry-runs, and SAT Runs for Record, Trouble shooting and Non-conformance work). Tower construction and ground activities associated with testing will not occur sequentially, as some testing will be conducted at the COP prior to ground testing. Field testing will only occur in association with tower sites TCA-AJO-003, 004, 170, 216, 302, and 310, will occur during daylight and at night, and will require from 5 to12 people. Tower characterization and SAT testing (two phases of field testing) will involve 12 people grouped in teams of two walking multiple routes at each tower site (TCA-AJO-003, 004, 170, 216, 302, and 310). Field testing personnel will use vehicles on authorized roads to travel to walking routes identified by CBP; however, the identified routes will be traveled on foot.

Construction activities are anticipated to begin in January 2009, and construction, including testing, activities will be completed no later than September 2010. The following Ajo 1 Tower deployment activities may take place during Sonoran pronghorn fawning season: 1) Site Security, 2) Sensor Payload Installation, 3) SAT Procedure, 4) Communication Acceptance Test Procedure, 5) Site Functional Checkout, 6) Unattended Ground Sensor Testing, 7) Tower Characterization, 8) SAT Dry-runs, 9) SAT Runs for Record, 10) Trouble shooting and Non-conformance work, and 11) Maintenance of Tower sites. Site security will require one to two security guards be present at all tower sites until construction is completed, and sensor payload installation will require 2 days per site and 12 people to complete. Apart from the aforementioned activities, no work will be conducted on towers during the Sonoran pronghorn fawning season, except at towers TCA-AJO-301 and 310. Sensor payload installation will be conducted on towers TCA-AJO-302 and 003 as close as possible to March 15.

Communication and Sensor Tower Construction Operation and Maintenance
The radars associated with the proposed sensor towers will emit continuously and have a mean power of 110.72 volts/m at 1 m from the radar, 4.43 volts/m at 25 m, 2.01 volts/m at 55 m, and 1.11 volts/m at 100 m. The hybrid propane generator/solar systems are expected to operate a total of 4 to 8 hours per day to bulk charge system batteries. Run times will be shorter on sunny days, when the solar array system will provide more of the system operating power. Generator run times for systems connected to commercial power grid will be limited to one hour twice per month for maintenance purposes, and if grid power is interrupted, backup generators will temporarily be operated, as needed, until grid power is available.

Tower site maintenance will include refueling of propane generators, as well as changing oil, oil filters, and spark plugs. The number of maintenance and refueling trips required per year varies depending on tower type (i.e., sensor) and power type (i.e., commercial grid power). Sensor towers powered by generator/solar systems require 36 maintenance and refueling visits per year; sensor towers connected to grid power require 14 trips; communication towers powered by generator/solar systems require 12 trips; and the one communication tower connected to grid power requires 7 trips (Table 1) (the complete maintenance plan for the SBI*net* Ajo-1 Tower Project is provided in Appendix D of the BA). Maintenance personnel will typically use a 0.5 or

0.75 ton four-wheel drive pickup truck with single rear tires to travel to each tower site accessible by road. A minimum of four and a maximum of eight qualified maintenance personnel will attend each maintenance visit. It is anticipated that one vehicle trip to and from each of the proposed tower sites will be required per maintenance visit. Tower sites connected to commercial grid power would require maintenance less than six times a year. Tanker trucks will be used to deliver fuel to each applicable tower. A total of approximately 191 vehicle trips per year will occur for tower maintenance and refueling (Table 1).

RAT sites will require maintenance up to four times per year. Maintenance at proposed tower site TCA-AJO-189 will require four helicopter trips per year. DHS anticipates maintenance personnel will access tower TCA-AJO-204 on foot via a foot trail. However, maintenance personnel may not be able to carry some equipment necessary for routine maintenance, and an occasional helicopter lift may be required for maintenance. Additionally, helicopter lifts will be required at proposed tower site TCA-AJO-204 for battery replacements; however, at this time the frequency of battery replacement is unknown and will depend on tower power requirements and weather conditions. Any helicopter lifts required for maintenance at proposed tower site TCA-AJO-204 will be coordinated with the OPCNM superintendent. Maintenance of all tower sites will be minimized to the extent possible and conducted in accordance with the maintenance plan for the SBI*net* Ajo-1 Tower Project (Appendix D of the BA). Currently, CBP Office of Information Technology maintains a repeater on Growler Mountain. To the extent possible CBP will conduct maintenance at proposed tower site TCA-AJO-189 and the existing repeater site at the same time to reduce helicopter flights in Cabeza Prieta Wilderness and Sonoran pronghorn habitat. Helicopter flights for maintenance activities will originate from Tucson, Arizona and will be coordinated through the USBP Tucson Sector's Public Lands Liaison Agent.

Table 1. Summary of Estimated Annual Vehicle Trips Required for RDT and SST Tower Maintenance and Refueling Efforts

Tower	Type	Function	Power Source	Maintenance Trips	Refueling Trips	Total
TCA-AJO-003	RDT	Sensor	Generator/Solar	24	12	36
TCA-AJO-004	RDT	Sensor	Generator/Solar	24	12	36
TCA-AJO-170	RDT	Sensor	Grid and Generator/Solar	13	1	14
TCA-AJO-216	RDT	Sensor	Grid and Generator/Solar	13	1	14
TCA-AJO-301	SST	Comm	Grid and Generator/Solar	6	1	7
TCA-AJO-302	RDT	Sensor	Generator/Solar	24	12	36
TCA-AJO-303	SST	Comm	Generator/Solar	6	6	12
TCA-AJO-310	RDT	Sensor	Generator/Solar	24	12	36
TOTAL				134	57	191

Comm = Communications

Roads

Road Repair, Improvements, Construction, and Maintenance
Repair and improvements of authorized roads and an authorized corridor, as well as construction of new roads, will be required to move construction equipment, materials, and personnel to and from the proposed tower sites during construction. Authorized roads are existing roads used for public access. The authorized corridor is a power line right-of-way and is not open to the public for vehicular use. Maps depicting authorized road improvements, authorized road repairs, authorized corridor repair, authorized corridor improvements, access roads, and new road segments at each proposed tower site are provided in Appendix B in the BA. Access road construction will be required to provide access from authorized roads to the proposed towers sites. All authorized roads and the authorized corridor will be maintained to allow access for routine tower maintenance activities.

SBI*net* will implement the following road construction and maintenance plan for the authorized road and corridor segments associated with the SBI*net* Ajo-1 Tower Project.

- SBI*net* will fund OPCNM to repair and/or improve the authorized road to proposed tower site TCA-AJO-310 and authorized corridor to proposed tower site TCA-AJO-170. All other authorized roads associated with the SBI*net* Ajo-1 Tower Project will be bladed to allow for construction equipment access.
- CBP (Facility Management and Engineering) will maintain roads, as determined by USBP, as part of the comprehensive maintenance plan discussed under road and corridor maintenance beginning in the summer of 2010.
- CBP (Facility Maintenance and Engineering) will conduct an engineering study of roads associated with the SBI*net* Ajo-1 Tower Project. The purpose of the study is to identify those roads susceptible to degradation and provide methods to upgrade these roads to prevent potential degradation of natural resources. It is anticipated the engineering study will be completed in the spring of 2010.
- Tucson Sector (Project Delivery Team) and OPCNM will collaborate on which roads are needed to support tactical infrastructure on OPCNM. USBP would prioritize to CBP (Facility Maintenance and Engineering) which roads to upgrade based on the engineering study. CBP will provide OPCNM with a detailed plan for road upgrades for 2010 and beyond.

Road and Corridor Repairs
A total of four authorized roads will require repairs along a total of 3.9 linear miles of road segments. These authorized roads are associated with TCA-AJO-004, 216, 303, and 310. Additionally, 4.4 linear miles of repairs will be required along the authorized corridor. Repairs include minor grading, leveling, and installation of nuisance drainage structures (i.e., graded low water crossings). All existing authorized roads are currently accessible by four-wheel drive

vehicles; thus, repair is only needed to allow passage of heavy construction equipment. All repaired road segments will be graded to a maximum driving surface width of 12 feet within the existing alignment of the road and will include a 2-foot temporary construction easement on each side of the road. OPCNM and CBP contractors will assess the need for road surfacing (including aggregate) and drainage structures for each proposed tower site and associated roads to prevent unacceptable impacts to roads, drainages, and adjacent areas. Drainage structures may include but are not limited to: ditches, culverts, and low water crossings. Road surfacing and drainage structures will be implemented as needed. Repairs to authorized roads will permanently impact 5.7 acres of existing roads and temporarily disturb 1.9 acres adjacent to authorized roads. Additionally, repairs to the authorized corridor will permanently impact 6.4 acres and temporarily disturb 2.1 acres.

Road and Corridor Improvements
Four existing authorized roads to proposed tower sites TCA-AJO-004, 170, 216, and 310 will require approximately 0.22 linear mile of improvements. Approximately 1.7 linear miles of the authorized corridor to proposed tower TCA-AJO-170 will require improvements. The road sections to be improved are located along the 59.4 Road, an unnamed BLM road, and Cement Tank Road. Road improvements include reconstruction, widening, and straightening of authorized roads. Improvements to authorized roads will permanently impact 0.32 acre of existing roads and temporarily impact 0.11 acre adjacent to existing roads. Additionally, improvements to the authorized corridor will permanently impact 2.4 acres and temporarily disturb 0.81 acre.

CBP will fund OPCNM to perform the authorized corridor improvements for proposed tower site TCA-AJO-170. Improvements will include trimming vegetation back from the driving surface throughout the corridor, preparing and installing arched culverts in three specific drainages, and contouring slopes on two drainages to the minimum needed to facilitate larger construction vehicle access. OPCNM will monitor the authorized corridor and add aggregate as necessary to prevent road degradation (i.e., blowouts).

Road Construction
A total of seven new access roads totaling 0.07 mile in length will be constructed to provide access to tower sites from existing authorized roads. The new access roads are associated with TCA-AJO-003, 004, 216, 301, 302, 303, and 310 and will be constructed to provide a 12-foot wide driving surface with 2-foot shoulders on each side. Additionally, one new road totaling 1.2 miles will be constructed from the international border north to tie into the existing Concrete Tank Road and provide access to proposed tower site TCA-Ajo-310. Construction equipment will stay within the 16-foot access road and tower site footprints. Any deviation from the 16-foot road footprint will be coordinated with and approved by the land manager prior to disturbance. Access roads will be constructed by mechanically removing vegetation and grading native soils. Land managers and CBP will assess the need for road surfacing (including aggregate) and drainage structures for each proposed tower site and associated roads to prevent

unacceptable impacts to roads, drainages, and adjacent areas. Drainage structures may include but are not limited to: ditches, culverts, and low water crossings. Road surfacing and drainage structures will be implemented as needed. Construction of access roads will result in 0.14 acre of permanent impacts, and new road construction associated with proposed tower site TCA-AJO-310 will permanently impact 2.3 acres. OPCNM will be responsible for constructing the new road associated with proposed tower site TCA-AJO-310; however, CBP will provide funding to OPCNM for the construction. Road construction activities will include removing vegetation from the proposed road footprint, scarifying the proposed road surface, blending aggregate, grading, and compacting. The uphill shoulder of the road will be delineated with sediment waddles and a soil binder will be applied to the finished road surface.

Road Maintenance

CBP is implementing a comprehensive maintenance and repair program for all roads and the authorized corridor on OPCNM associated with CBP TI and SBI*net* projects required to ensure full-time access to the towers and other tactical infrastructure. Specific maintenance requirements and schedules for each road and the authorized corridor will be developed between the USBP Sector and the land manager. Maintenance may be performed by contractors or by the land manager as deemed appropriate between the USBP Sector and land manager. This comprehensive program will be subject to future section 7 consultation, as appropriate; road maintenance for Ajo 1, however, will be addressed in this consultation. Should the Ajo 1 maintenance plan change as a result of developing the comprehensive program, those changes will be addressed through amending or reinitiating this consultation. For Ajo 1, it is anticipated that maintenance activities of authorized roads and the authorized corridor may occur up to six times per year or as necessary. In addition to the authorized road and corridor segments constructed, repaired, and improved as part of the proposed action, CBP will maintain additional lengths of authorized roads and an authorized corridor (38.2 linear miles total) to provide access to the tower sites for maintenance and refueling purposes (Figure 4). It is anticipated that maintenance of authorized roads and the authorized corridor could include grading within the existing road or corridor alignment to maintain the condition of the road or corridor surface for tower maintenance access. At the land manager's discretion, additional aggregate or a soil stabilizer such as Pennzsuppress^{TM} may be used to improve the driving surface of maintained authorized roads or corridor. Maintenance actions will include necessary erosion control associated with the roads and authorized corridor. Road maintenance activities will be conducted outside the Sonoran pronghorn closure season to the extent practicable. Specific cases (i.e., road impassable) where road or corridor maintenance is required during the Sonoran pronghorn closure season to allow maintenance to a tower site will be coordinated with and require approval from the land manager and FWS-AESO. Additionally, biological monitors will be required during authorized road and corridor maintenance activities during the Sonoran pronghorn closure season. If a significant upgrade in road or authorized corridor condition is required, CBP will ensure all environmental compliance requirements, including section 7 consultation, are met before the work is conducted.

U.S. Border Patrol Operations and Activities Associated with the Ajo 1 Project

CBV Detection and Interdiction

Currently a lack of technology for real time location of CBVs exists. This lack of technology requires a large deployment of personnel to address CBV activity in the Ajo Station's AOR. Currently, USBP agents perform their enforcement duties through a series of labor intensive steps – detect, identify, classify, respond, and resolve. CBV detection methodology within the Ajo Station's AOR currently includes traditional sign cutting, which requires both patrolling and dragging of roads, particularly east-west roads. To ensure timely detection and effective response, patrolling and dragging takes place on a regular basis within each shift. Remote sensors are also strategically placed to aid detection and interdiction of CBV activity. Once detected, the agents must identify the type of traffic (i.e., verify that the sign was made by CBV traffic) and classify its threat. Finally, USBP agents respond to evidence of CBV entry by following the detected sign (as opposed to the viewed subjects). Following sign means that there is an inherent time delay between the responding agents and the suspects. Agents respond on foot, horseback, all terrain vehicles and motorcycles, and with rotary wing aircraft. The majority of USBP Tucson Sector air operations occur during the day, unless there is an emergency. The Ajo USBP Station currently and over the past few years has had no nighttime flights.

Generally, fixed-wing aircraft are not used in the Ajo Station's AOR; however, light, medium, and heavy rotary wing aircraft are available and used depending on the CBV activity in the area. When necessary, agents may respond in motor vehicles under the provisions of the Cooperative National Security and Counterterrorism Efforts on Federal Lands along the United States' Borders Memorandum of Agreement (MOU) among DHS, DOI, and U.S. Department of Agriculture (USDA) (DHS 2006). The MOU states (page 6, IV.B.4), "Nothing in this MOU is intended to prevent CBP-BP agents from exercising existing exigent/emergency authorities to access lands, including authority to conduct motorized off-road pursuit of suspected CBVs at any time, including in areas designated or recommended as wilderness,….". At the same time, if vehicles are operated off road in areas not designated for such use, CBP-BP is to use "the lowest impact mode of travel practicable to accomplish its mission and operate all motorized vehicles in such a manner as will minimize the adverse impacts on threatened or endangered species and on the resources and values of the particular Federal lands, provided officer safety is not compromised by the type of conveyance selected" (page 8, IV.C.3; DHS 2006). The choice of the mode of transportation is based on a variety of factors, including terrain, time of day, availability of low impact modes, and timeliness of the sign, but the deciding factors are always effective and timely interdiction with primary consideration of officer safety.

The aforementioned traditional patrol and interdiction methods will continue to be used after the SBI*net* towers are operational as deemed necessary by the USBP. However, once the towers are operational, three of the steps required to achieve the requisite satisfactory law enforcement conclusion (detection, identification, and classification) will be primarily performed remotely by a person monitoring signals from the technology. This person will be located in a control room and thus will not affect the environment in the same manner as an agent using traditional sign-cutting and tracking methods. Because the towers will provide constant situational awareness,

improved detection and tracking capabilities, and real time identification and classification of CBVs, USBP agents will be able to optimize interdiction points and respond to verified threats in a manner tactically advantageous to the agent (i.e., manner that provide the greatest safety and efficiency), while taking into consideration sensitive environments (the identification of sensitive environments and resources are provided as part of agent training). These focused interdiction methods will result in increased USBP efficiency and an eventual reduction of the number of USBP personnel deployments required to locate CBVs. Tower technology is also expected to reduce the need for agents to patrol within the project area to look for signs of CBV activity. The number of occasions as well as the extent to which the agent will be required by the circumstances to drive a vehicle off of authorized roads is expected to be greatly reduced.

Other tactics will be used so that effective control will be achieved for the entire Ajo Station AOR. This means that CBV activity levels will be reduced throughout the AOR. As operational effectiveness increases over time, CBV traffic will decrease resulting in a reduced need for agents to respond to a given area. Ultimately, the towers will continue to provide deterrence through continual monitoring, and resources can be redeployed to other operational priorities. Other areas that receive increased CBV traffic will be addressed using agents as well as using future deployments of technology.

Remote Sensors and Mobile Surveillance Systems

Remote sensors (e.g., unmanned ground sensors or similar devices) and Mobile Surveillance Systems (MSS) will be used to detect CBV activity in the project area as deemed appropriate by USBP. These sensors and systems will support the effectiveness of the towers, and ultimately, the COP, which is planned as the primary tool for remotely classifying CBV traffic and providing information to responding USBP agents. Remote sensors will be installed with minimal disturbance to vegetation and soils with a minimum number of trained personnel. Furthermore, to keep disturbance to a minimum, sensors will be installed and maintained by personnel on foot. Once installed, only essential maintenance will be conducted and all site visits will be kept to an absolute minimum. Remote sensor use in sensitive habitats is of value in providing law enforcement resolution for CBV entries that pass through these areas. Tower coverage is expected to largely replace remote sensors currently being used in some areas. MSS will be deployed and operated on vehicles that traverse existing roads.

Road Dragging

Traditional CBV detection methodology of sign cutting and dragging of roads will continue in support of USBP's National Strategy, as necessary. The 2006 MOU (page 4, IV.B.2) provides for the dragging of existing public and administrative roads that are unpaved for the purpose of cutting sign (DHS 2006). With implementation of the SBI*net* Ajo-1 Tower Project, real time identification and classification of CBVs and consequently, an increased certainty of apprehension, is anticipated. As the certainty of apprehension is elevated within the Ajo Station's AOR, the use of dragging operations is expected to be reduced in frequency compared to current levels.

Checkpoint and Observation Posts

Checkpoint operations are a critical component of USBP's strategy to gain effective control of the international border and augment other enforcement activities. Existing USBP checkpoints will be maintained, and there is no expectation that they will be directly affected by this project. The Ajo Station maintains one checkpoint on SR 85 at Milepost 18. An alternate checkpoint site used in the past is located at Milepost 57. Checkpoints within the viewshed of the COP will benefit by the presence of the project in that attempts to walk around the checkpoints will be identified and the appropriate law enforcement actions will be taken.

High point observation posts entail USBP agents walking to an area of higher elevation to achieve an advantage in observing CBV traffic. Use of high point observation posts will continue as needed to enhance the overall effectiveness of operations throughout the Ajo Station's AOR.

Off-Road Vehicle Use

Certain CBP field operations, such as pursuing suspected CBVs, turning around drags and trailers, parking along roads, towing out seized vehicles, negotiating adverse road conditions, and responding to emergency situations, result in impacts along authorized roads and unauthorized vehicle routes (UVRs). Impacts generally consist of disturbances to vegetation and soils from vehicle tires. Though implementation of the proposed project will allow USBP to improve the focus of interdiction efforts, USBP will continue to conduct field operations, including, when necessary, motorized off-road pursuit of suspected CBVs within the parameters of the 2006 MOU, which states (page 6, IV.B.4), "Nothing in this MOU is intended to prevent CBP-BP agents from exercising existing exigent/emergency authorities to access lands, including authority to conduct motorized off-road pursuit of suspected CBVs at any time, including in areas designated or recommended as wilderness,….". At the same time, if vehicles are operated off road in areas not designated for such use, CBP-BP is to use "the lowest impact mode of travel practicable to accomplish its mission and operate all motorized vehicles in such a manner as will minimize the adverse impacts on threatened or endangered species and on the resources and values of the particular Federal lands, provided officer safety is not compromised by the type of conveyance selected" (page 8, IV.C.3; DHS 2006). Through education and supervision, however, USBP in cooperation with land managers will increase USBP agents' awareness of the impacts of these actions and use of standard methods to minimize impacts. CBP will continue to work with land managers to facilitate operational needs while making every reasonable effort to reduce impacts. USBP will ensure that current and incoming agents attend environmental and cultural awareness training to be provided by the land management agencies.

Forward Operating Base

The USBP Ajo Station currently maintains and operates a FOB on OPCNM at the Bates Wells historic site (see Figure 1). FOBs allow USBP to deploy agents closer to the U.S.-Mexico border for the purpose of detecting and responding to CBV activities more efficiently and effectively.

This forward deployment decreases travel and response time to CBV activities. USBP proposes to move the FOB at Bates Well to a proposed location adjacent to TCA-AJO-302 and disassemble the existing FOB infrastructure at Bates Well historic site. The move will concurrently place agents in a more strategically beneficial position to respond to CBV traffic further from existing USBP stations. The new FOB will maintain current operational strength unless activity dictates otherwise. The Organ Pipe Cactus National Monument Superintendent will be notified of any increase or decrease in operational needs or assets that support these needs. Additional environmental compliance will be conducted at that time, including section 7 consultation, as appropriate.

The FOB will be moved outside the Sonoran pronghorn fawning season (March 15 to July 31) and within 1 year of the date of this biological opinion (electronic mail from USBP, September 21, 2009). Current equipment at the Bates Well FOB includes three 8- x 24-foot connex boxes, three portable generators, one diesel fuel trailer, a 1,000 gallon water truck, a 500 gallon water buffalo on trailer, and one portable light generator. Equipment and facilities (i.e., connex boxes and generators) will be removed from the Bates Well site, and the parking area and portable horse corral area will be cleaned up. It is anticipated that all equipment generators and water tanks can be moved within two to three days after the initiation of disassembly; however, the connex boxes may require up to one week to move to the proposed FOB site adjacent to TCA-AJO-302. The generators and water tanks can be moved with a four-wheel drive pickup but the connex boxes will require a rollback truck.

Generators associated with the new FOB will operate 24 hours a day, 7 days a week and will be baffled such that associated noise will be limited to less than 35 dBA at 492 feet from the generator. The portable light generator associated with the new FOB will be on full time during the hours of darkness. The generator powered light is a wheel mounted, stand alone unit with a hand crank mast that can be extended to approx 20 feet; the top of the mast has four lights with controls to each light. Instead of using the portable light generator, the same (or less) amount of lighting may be provided by drawing power from the other generators already in service on the site. To minimize lighting impacts, to the extent that the effectiveness of the lights and security is not compromised, the light will be selectively placed, pointed down toward the ground, and shielded to prevent light from going up into the sky, or out laterally beyond the FOB site footprint.

The proposed FOB will have a footprint of approximately one acre and similar equipment as the current FOB with the exception that a deep-discharge septic system will be installed for waste water and sewage disposal at the proposed FOB site. A portable chemical toilet will be used for processing human waste until the septic system can be installed. The septic system will be of sufficient design and capacity for up to ten people. The septic system will be constructed to the International Building Code and Arizona Department of Environmental Quality's standards for septic systems.

The new road to be constructed for access to TCA-AJO-302 will also serve as access from El Camino del Diablo to the proposed FOB. There will be no new road construction associated with the proposed FOB. Bates Well Road will be maintained up to six times a year to ensure access to TCA-AJO-302 and the FOB.

One vehicle per USBP agent minimum may be parked within the footprint of the proposed FOB. The number and extent of USBP vehicle trips will vary depending on operational needs. The primary geographical focus will start in the area surrounding the camp. However, agents will respond as directed to work other areas of the Ajo Station's AOR as operations dictate. Additionally, horse patrols may be conducted from the proposed FOB when operations dictate. Horses will be housed at the proposed FOB and will either be ridden or trailered to patrol areas. Manure from the horse corral would be collected and disposed of off-site in accordance with the Best Management Practices (BMPs - see below). The FOB will be operated up to 365 days per year as long as CBV activities persist that require its operation. When USBP determines the FOB is no longer needed, it will be dismantled and removed within one year of USBP's determination. The site would be restored to previously existing conditions in coordination with the land manager and the FWS-AESO.

Shifts in CBV Traffic
As operations within an area become more effective, CBVs generally seek alternate routes and avenues of escape. USBP will deploy agents, sensors, MSS units, and other technology to supplement tower technology. If, however, concerns arise regarding trends in CBV traffic and their effect on resources, USBP and the land managers will work collaboratively to find solutions to the operational challenges.

Tolerance of Depth of Intrusion
Tolerance to depth of intrusion relates to the time and distance that agents have to effectively interdict CBV traffic. In more rural and remote areas, where CBVs may take days to reach an area where they can load into a vehicle and escape, tolerance to depth of intrusion may be many miles, or days in the terms of CBVs walking through the hazardous desert terrain. In these remote areas, the ability of USBP to move laterally within the area of operation is critical to successful interdiction. Agents must be able to respond and interdict consistently to create the necessary deterrence through certainty of arrest.

USBP's operational intent is to compress the primary zone of enforcement as close to the international border as practical. Several factors determine the viability of compressing an enforcement zone, such as access to routes of egress, available infrastructure capable of supporting smuggling activity, viability of checkpoint operations that provide enforcement-in-depth, and accessibility to the border areas. In order to attain border control with the optimal enforcement zone relatively close to the border, significant resources must be applied and effectiveness sustained over time to control CBV activity.

The deployment of technology such as SBI*net* towers will facilitate the effective interdiction of traffic through detection and tracking of multiple targets within a given tower area. Tolerance to depth of intrusion is directly related to activity levels and the point at which the existing law enforcement resources are able to resolve known intrusions. As resources are adjusted and applied to existing activity levels, effectiveness improves over time. The objective of this enforcement strategy is to maximize interdiction capabilities so that traffic levels are reduced to a level where border control can ultimately be achieved on or as close to the actual border as practical. However, in areas where enforcement is not focused on the immediate border for operational reasons, the effect will still be to reduce traffic. Effective enforcement, even a distance off of the border, removes the financial incentive for smuggling organizations to use the area. This provides increased safety and environmental protection in the entire area once the reason for criminal activity to exist in the enforcement area has been removed.

Ultimately, as the area comes under effective control, the tolerance to depth of intrusion will be contained within the optimal enforcement zone, as close as practical to the border. As USBP does not control the various independent factors influencing CBV activity, this distance will vary from place to place within the target area depending on various factors. Given the dynamic nature of law enforcement operations and the fact that USBP will always be responsive to the ever changing threat, exact parameters cannot be predicted; however, as stated above it is USBP's intent is to compress enforcement activities as close to the international border as is operationally appropriate within a given area.

SBI*net* towers will also allow USBP agents to control the point of interdiction to locations that are operationally preferred (i.e., points of interdiction that contribute to safety and efficiency). These locations will ideally be on or close to existing roads so that agents do not have to walk or drive long distances to and from the point of interdiction, and transportation can be facilitated quickly and efficiently as close to the point of interdiction as possible. Due to the technological capabilities afforded by the project, USBP agents will be able to manage points of interdiction, providing operational efficiencies and the ability to make decisions with regard to environmental impacts. The need for basic patrols and extended tracking operations in remote areas will be reduced.

CBVs are deterred from areas where there is an increased certainty of arrest due to increased operational effectiveness. As USBP increased operational effectiveness is maintained over time, CBV traffic flow will be reduced within the target area and the tolerance to depth of intrusion, level of USBP activity, and the USBP operational footprint will all be concurrently reduced. Based on current traffic patterns, available resources, and trends observed in Yuma Sector and the Altar Valley, a decrease in illegal traffic could be realized within one year of the towers becoming operational.

Focused Operations
When USBP identifies an area of focus under the USBP's National Strategy various combinations of manpower, technology, infrastructure, and enforcement programs are designated for application. Within the operational footprint, a baseline level of activity is established; resources are then deployed in an effort to significantly reduce this baseline activity level. Forms of technology (e.g., SBI*net* towers, sensors, and MSS) are used as force multipliers to provide sustained deterrence in a targeted area. These technological assets serve to provide enhanced situational awareness (i.e., enhanced ability to see, in real-time, what activities are taking place on a large scale, as well as where activity is occurring). This enables USBP agents to evaluate, plan, and respond in a focused manner to ultimately interdict an increased number of CBVs in an area. Over a relatively short period of time, USBP's increased ability to bring identified CBV activity to a satisfactory law enforcement resolution reduces the financial incentives for criminal organizations to operate within the area affected by the technology.

Ultimately, the reduction or elimination of CBV activity in an identified area results in a corresponding reduction of the USBP's footprint in the area, as enforcement actions can be scaled back in the absence of violations.

Both Altar Valley and Yuma Sector were recently identified as areas of focus, and these examples (see BA for details) model the National Strategy in that as effective control was achieved, the zone of enforcement in both areas trended closer and closer to the border over time. This reduced the overall operational footprint and tolerance to depth of intrusion, and thereby reduced the footprint of illegal crossings within the target area as well. For example, in Altar Valley, the concentration of patrols is now typically within a range from 0 to 10 miles from the border, depending on access and activity levels, instead of patrolling a 45-mile deep zone as was typical before the Valley became an area of focus.

Based on current traffic patterns, available resources, and trends observed in Yuma Sector and the Altar Valley, a decrease in traffic could be realized within one year of the Ajo-1 towers becoming operational. This operational evolution will likely be marked by an initial increase in arrests and seizures as operational effectiveness is markedly increased. However, over time, as USBP effectiveness is increased, CBV activities will decrease, resulting in an appropriately adjusted lower level of USBP operational output and reduced USBP operational footprint.

Monitoring Project Effectiveness
Because there are multiple factors that impact the flow of CBV traffic into the U.S., it is extremely difficult to put a timeline on the operational impact of the proposed project. However, it is predicted that a minimum of one year will be needed to affect a decrease in traffic. Generally, USBP monitors CBV activity levels through a variety of indicators, including arrests, assaults, third party reporting, intelligence reporting, anecdotal information, and other internal metrics, which when combined, paint a relatively accurate picture of cross border activity.

Conservation Measures

Avoidance and Minimization Measures

Avoidance and minimization best management practices (BMPs) and success criteria were compiled through coordination with USFWS and from the USFWS Information, Planning and Consultation System (https://ecos.fws.gov/ipac/). They are provided in Table 1. These construction and maintenance BMPs will be implemented at all proposed tower sites and associated access and approach roads. Avoidance and minimization BMPs for USBP operations are provided in Table 2. Additionally, some BMPs currently employed by USBP are delineated in Section IV.C (1-10) of the 2006 MOU between DHS, DOI, and USDA (DHS 2006). These BMPs include efforts by USBP to interdict CBVs close to the international border, road maintenance, use of lowest impact modes of travel appropriate for the circumstance, appropriate notifications and consultation, providing new agents environmental training, providing monthly statistics to land management agencies, early consultation regarding new projects affecting land managers, and notification protocols for operational issues.

Table 1. Avoidance and minimization Best Management Praces for construction and maintenance for the SBI*net* Ajo-1 tower project.

BMP No.	BMP Category*	BMP text	Success Criteria
1	Planning	Develop and provide USFWS and DOI land management agencies a map and the following geospatial data in a GIS compatible format (i.e., ESRI shapefiles or geodatabase feature classes): Sonoran pronghorn locations (the pronghorn location data will indicate the year or range of years in which the data were collected); lesser long-nosed bat roosts; proposed DHS tower sites and access roads; roads proposed to be maintained; authorized roads; existing and proposed BP FOBs; border vehicle and pedestrian fences (the fence data will include the following information related to each feature: type, length, segment number, and associated project [e.g., PF 225, VF300, VF70, legacy, etc]); property boundaries; and other geospatial data as appropriate (i.e., if useful for analyzing the effects of the project on Sonoran pronghorn). DHS will collect all UTM coordinates using a single datum and will indicate which datum was used. All geospatial data created shall meet the USFWS data standards referenced on the USFWS website at http://www.fws.gov/data/. Data must include digital metadata compliant with the most recent Federal Geographic Data Committee (FGDC) metadata standard as mandated in OMB Circular A-16 and Executive Order 12906.	A map and geospatial data in a GIS compatible format are provided.

2	Planning	Develop a detailed site plan for each tower site and all associated roads (including construction and maintenance access roads and patrol roads) and staging areas to minimize impacts to natural and cultural resources. Site plans will be developed with and approved by the land managers and among other items, it will include dimensions of tower footprint, height of the tower, power source for the tower, level of noise generated by each tower, maintenance schedule of each tower and associated roads, construction schedule, *etc.* The plans will be included in the description of the Proposed Action of the BA and EA.	Site plans are developed, approved, and included in the BA and EA.
3	Footprint demarcation	Minimize impacts to Sonoran pronghorn and lesser long-nosed bats and their habitats by using flagging or temporary fencing to clearly demarcate project construction area perimeters, including access roads, with the land management agency. Do not disturb soil or vegetation outside of that perimeter.	Flagging and/or fencing was placed around the construction site and disturbance to soils and vegetation outside the fence did not occur.
4	Ground Disturbance	Site, design, and construct towers and their associated facilities, including roads, to avoid or minimize habitat loss within or adjacent to the footprint. Minimize access road and fence construction. Minimize the amount of above-ground obstacles associated with the site.	Project implementation plans minimize disturbance areas using appropriate BMPs. Fencing and above-ground structures are the minimum needed for operation.
5	Ground Disturbance	Minimize impacts to listed species and their habitats by using areas already disturbed by past activities, or those that will be used later in the construction period, for staging, parking, laydown, and equipment storage. If site disturbance is unavoidable, minimize the area of disturbance by scheduling deliveries of materials and equipment to only those items needed for ongoing project implementation.	Project site plan developed and implemented that minimized project footprint.
6	Ground Disturbance (Grading)	Minimize impacts to listed species and their habitats by limiting grading or topsoil removal to areas where this activity is absolutely necessary for construction, staging, or maintenance activities.	Grading and topsoil removal was limited to where needed for project implementation.
7	Ground disturbance	Minimize impacts to listed species and their habitats by locating corrals and staging areas for equestrian operations in existing disturbed areas.	Facilities located in disturbed areas.
8	Ground disturbance	Minimize habitat disturbance by restricting vegetation removal to the smallest possible project footprint. Limit the removal of trees, cacti, and brush to the smallest amount needed to meet the objectives of the project. If vegetation must be removed outside the permanent project footprint, allow natural regeneration of native plants by cutting vegetation with hand tools, mowing, trimming, or using other removal methods that allow root systems to remain intact.	Vegetation is not removed beyond the project footprint.

9	Vegetation Removal - Birds	Do not remove more than 10% of vegetation from suitable nesting or migration habitat or reduce it to less than 10 acres in size. Avoid removal of dense understory or midstory vegetation from breeding and migration habitat to the extent possible.	Vegetation removal criteria are met.
10	Vegetation Removal	Include a configuration to support fire management operations in the design of roads, fences, and other facilities that require land clearing.	CPB worked with landowner/manager to develop and then incorporate fire concerns into project design.
11	Fire Management	Minimize fences and other infrastructures that may be damaged due to periodic wildfire.	Fences and other infrastructures are minimized. Fire plan is completed and approved by land management agencies.
12	Bird Management	Towers, light poles, and other pole-like structures will be designed to discourage roosting and nesting by birds, particularly ravens or other raptors that may use the poles for hunting perches. Tubular supports with pointed tops will be used rather than lattice supports to minimize bird perching and nesting opportunities. Avoid placing external ladders and platforms on tubular towers to minimize perching and nesting	Appropriate design to discourage perching implemented for poles and towers. No ladders, platforms, or other places for birds to perch or nest are placed on towers.
13	General - Birds	Comply with the Migratory Bird Treaty Act.	Project does not cause bird mortality.
14	Fences - Birds	For fences associated with Tower projects: cover/cap all hollow vertical fence posts (*i.e.*, those that will be filled with a reinforcing material such as concrete) from the time they are erected to the time they are filled.	Covers and caps in place on both top and bottom of fence posts to prevent animal access.
15	Lights - Birds	Implement USFWS (2000) Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers to reduce night-time atmospheric lighting and the potential adverse effects of night-time lighting to migratory bird and nocturnal flying species.	USFWS Guidance followed.
16	Tower Planning - Birds and Bats, including Lesser Long-nosed Bats	As there are many important bird and bat use areas in the SBI*net* Ajo Tower Project Action Area (*i.e.*, raptor migration area on top of Mount Ajo; bat foraging areas throughout the Arizona upland Sonoran desertscrub vegetation community), ensure the most recent bird and bat strike avoidance guidance is followed for tower design.	Bird and bat strike guidance followed.

17	Tower Design - Birds and Bats, including Lesser Long-nosed Bats	Use tower designs that do not require guy wires for support.	Towers have no guy wires.
18	Tower Upgrade - Birds and Bats, including Lesser Long-nosed Bats	For upgrading towers, CBP follow the guidelines for new construction as closely as possible. CBP will retro-fit sites with high bird or bat mortality.	BMPs for new construction included in project plan. Retro-fit included in upgrading plans.
19	Tower Modification - Birds and Bats, including Lesser Long-nosed Bats	If results of the Ajo-1 lesser long-nosed bat or the Tucson-West Tower Project bat and bird monitoring studies indicate that towers result in significant disturbance to bats or birds, with the guidance of USFWS and the land management agencies, modify and update bird and bat strike avoidance equipment on the Ajo-1 towers and implement techniques that reduce the disturbance to birds and bats.	BMPs for new construction included in project plan. Retro-fit included in upgrading plans.
20	Food plants - Lesser Long-nosed Bats	Avoid disturbing areas containing columnar cacti (saguaro, organ pipe, senita) or agaves to the extent reasonable. If they cannot be avoided, columnar cacti and agaves should be salvaged and transplanted. When salvage is not possible, columnar cacti and agaves will be purchased and planted at a 3:1 ratio. Salvage, transplantation, and container planting will be done in accordance with a restoration plan, approved by the land manager and USFWS, that includes success criteria and monitoring.	Cacti and agaves are avoided, or a plan to salvage/transplant/replace is developed and implemented.
21	Seasonal restrictions - Lesser Long-nosed Bats	Avoid effects to bats in bat roosts by not implementing construction activities within 4 miles of the roost between May 1 and September 30.	Construction activities do not occur between May 1 and September 30. Mitigation may be needed if seasonal restrictions not implemented.
22	Roosts - Lesser long-nosed bat	Avoid entering lesser long-nosed bat roosts (except in emergency/exigent circumstances).	Roosts are not entered except for enforcement purposes under emergency/exigent circumstances (*e.g.* to remove CBV traffic).
23	Infrastructure minimization – Sonoran pronghorn	Minimize to the greatest extent possible the number of roads, detection and communication towers, and other infrastructure in Sonoran pronghorn habitat, particularly in movement corridors and areas important to Sonoran pronghorn during the fawning season (March 15 to July 31).	Number of roads, towers, and other infrastructure minimized. No or minimal change in Sonoran pronghorn behavior or reproduction.

24	Trip minimization - Sonoran pronghorn	Minimize the number of construction and maintenance trips to all tower sites, particularly those in important Sonoran pronghorn areas.	Number of maintenance trips minimized. No or minimal reduction in habitat use or Sonoran pronghorn reproduction.
25	Vehicle minimization - Sonoran pronghorn	Minimize animal, particularly with Sonoran pronghorn, collisions by minimizing the number of construction vehicles travelling to and from the project site and the number of trips per day. Coordinate construction vehicle activity with land managers at their discretion.	Number of construction vehicles and trips per day minimized.
26	Speed limits - Sonoran pronghorn	Minimize animal collisions, particularly with Sonoran pronghorn, by not exceeding construction and maintenance speed limits of 25 mph on all unpaved roads.	Construction BMPs contained required speed limits and these were enforced.
27	Road installation and speed management - Sonoran pronghorn	Avoid and minimize animal collisions, particularly with Sonoran pronghorn, and fragmentation of Sonoran pronghorn populations by using proper road design techniques.	Road design features coordinated with USFWS to minimize risks.
28	Seasonal restrictions- Sonoran pronghorn	Apart from site security, sensor payload installation, tower testing, and maintenance, CBP will avoid Ajo 1 work activities from March 15 to July 31 (i.e., the Sonoran pronghorn fawning season) in Sonoran pronghorn habitat (towers TCA-AJO-301 and 310 are outside of Sonoran pronghorn habitat). Sensor payload installation will be conducted on towers TCA-AJO-302 and 003 as close as possible to March 15. CBP will make every attempt possible to complete all sensor payload installation and testing in Sonoran pronghorn habitat as close as possible to March 15.	Apart from site security, sensor payload installation, tower testing, and maintenance, towers and associated infrastructure in Sonoran pronghorn habitat are not constructed between March 15 and July 31.
29	Seasonal restrictions - Sonoran pronghorn	Place restrictions on construction vehicle activity during the Sonoran pronghorn fawning season (March 15 to July 31) to avoid and minimize disturbance to females and fawns.	Restrictions are in place and enforced.
30	Monitoring - Sonoran pronghorn	Ensure a qualified Sonoran pronghorn monitor is on-site during tower construction (and maintenance where specified – see BMP #81) in Sonoran pronghorn habitat. Land management agencies within Sonoran pronghorn habitat and USFWS-AESO will work with DHS to define "qualified Sonoran pronghorn monitor". DOI will develop Sonoran pronghorn monitoring and communication protocols for each tower site and provide them to CBP; protocols may vary among tower sites depending on various factors including the location of the tower in relation to Sonoran pronghorn use, time period (i.e., within or outside of the fawning season), etc. Unless otherwise detailed in the tower-specific protocols, before any construction work commences in Sonoran pronghorn habitat, the monitor will conduct hilltop surveys (visual and telemetry, if appropriate)	Pronghorn are monitored and no construction activities initiated until after pronghorn move on their own volition to a distance greater than 2 miles from the activities. Monitoring reports are submitted and pronghorn detections reported on time.

30		for Sonoran pronghorn at sunrise in close coordination with land managers and AGFD. If Sonoran pronghorn are detected within 2 miles of proposed daily project activities, no project work will begin until Sonoran pronghorn move on their own volition to a distance greater than 2 miles from the activities (note: monitoring method and buffer distance is project specific; 2 miles is for tower construction, see criteria for project maintenance below). The Sonoran pronghorn monitoring protocols will include procedures to be followed if and when Sonoran pronghorn are detected within the two mile radius around work activities, including CBP Sonoran pronghorn monitor communications with DOI land manager, cessation of construction, and egress from the construction site. Additionally, the protocol will require the Sonoran pronghorn monitor to contact AGFD on a weekly basis to obtain the results of the telemetry surveys (note, these are different than fawning season aerial surveys described in BMP #80) and use the information to aid in weekly monitoring; a communication protocol regarding these surveys will be developed as part of the overall monitoring protocol. Daily Sonoran pronghorn monitoring reports will be provided (electronically mailed) to USFWS and DOI land managers on a weekly basis (due the following Monday). Sonoran pronghorn detections (with coordinates and time of detection) will be reported by electronic mail or phone call to the land managers with 24 hours of the detection. CBP and their environmental monitors, DOI, and AGFD will meet at least two weeks prior to the initiation of any tower construction activities to discuss Sonoran pronghorn monitoring protocols.	
31	Monitoring – Sonoran pronghorn	DOI will develop a protocol that will include procedures to be followed if and when Sonoran pronghorn are detected within the one mile radius around maintenance activities, including CBP Sonoran pronghorn monitor communications with DOI land manager, cessation of maintenance, and egress from the maintenance site. Unless otherwise detailed in the aforementioned protocol, for project maintenance and maintenance access, cease all work that may disturb a Sonoran pronghorn if one is seen within 1 mile of the project site or any access road to the site. For vehicle operations, this entails stopping the vehicle until the animal moves away on its own volition. Vehicles may then continue on at no more than 15 miles per hour. Maintenance crews and personnel in vehicles will wait up to 3 hours from the initial sighting for the animal to move beyond 1 mile. If the animal has not moved the required distance, all personnel will retreat back away from the animal. Ensure all maintenance-related personnel are trained to identify Sonoran pronghorn. Report pronghorn detections (with coordinates and time of detection) by electronic mail or phone call to land managers within 24 hours of the detection.	All maintenance related personnel will be trained to identify Sonoran pronghorn and will have authority to stop work. Pronghorn detections are reported.

32	Fawning Season Monitoring – Sonoran pronghorn	For sensor payload installation and tower testing during the Sonoran pronghorn fawning season, CBP will conduct Sonoran pronghorn monitoring at all tower sites in Sonoran pronghorn habitat per BMP #30. However, during sensor payload installation and testing during the fawning season at towers TCA-AJO-302 and 003, CBP will provide two monitors. During sensor payload installation and testing during the fawning season at other towers in Sonoran pronghorn habitat, CBP will provide a minimum of one and up to two monitors, depending on whether or not Sonoran pronghorn are detected by aerial surveys. During the testing phase only, Sonoran pronghorn monitors could also serve as environmental monitors.	Pronghorn monitoring and reporting protocols are followed.
33	Fawning Season Monitoring – Sonoran pronghorn	For Ajo 1 project work being conducted during the Sonoran pronghorn fawning season, CBP will follow DOI Sonoran pronghorn fawning season monitoring protocols, which include daily coordination with AGFD and DOI. The monitoring protocols will be based on BMPs 34 to 37. The details will be developed by DOI in coordination with CBP and provided to CBP in writing before initiation of project construction. CBP and their Sonoran pronghorn monitors, DOI, and AGFD will meet one month prior to the fawning season (by February 15) to discuss Sonoran pronghorn fawning season monitoring protocols, including monitoring and communication methodology. The CBP Sonoran pronghorn monitor will set up the meeting.	Pronghorn monitoring and communication protocols are followed. A pre-fawning season meeting is held.
34	Fawning Season Monitoring – Sonoran pronghorn	During the fawning season 2010, CBP Sonoran pronghorn monitors will contact AGFD on a weekly basis to obtain aerial survey (see Sonoran pronghorn offsetting measure #10) information (a contact and communication protocol will be established by February 15, 2010). If during the AGFD aerial surveys, Sonoran pronghorn are detected within 2 miles of proposed daily project activities, no project work will begin until Sonoran pronghorn move on their own volition to a distance greater than 2 miles from the activities. If during aerial surveys, Sonoran pronghorn are detected in an area where ground-based monitoring may disturb them, AGFD will notify the monitors to avoid the area until AGFD and DOI determine monitoring activities may resume. During aerial surveys, no Ajo 1 work activities may occur at tower sites TCA-AJO-302, 003, and 004; however, work may be conducted at the other towers providing Sonoran pronghorn were not detected the previous day within two miles those towers.	Pronghorn monitoring and communication protocols are followed.
35	Fawning Season Monitoring – Sonoran pronghorn	For tower maintenance during the fawning season of 2010, CBP will follow BMP #31; except that at TCA-AJO-302 and 003 both BMP #31 and 30 will be followed during the fawning season of 2010.	Pronghorn monitoring protocols are followed.

36	Monitoring – Sonoran pronghorn	CBP will provide sky towers for towers sites TCA-AJO-302 and 003, from which monitors will conduct Sonoran pronghorn monitoring.	Sky towers are provided and monitoring is conducted from them.
37	Monitoring – Sonoran pronghorn	The CBP Sonoran pronghorn monitor will have the full authority to delay and stop any Ajo 1 Tower construction and maintenance project work within two miles and one mile, respectively, of a Sonoran pronghorn in accordance with BMPs 30, 31, 34, and 38.	The monitor is granted authority to delay and stop Ajo 1 construction and maintenance work per protocol.
38	Noise - Sonoran pronghorn	Minimize duration of noise exposure to maintain projects in Sonoran pronghorn habitat. If helicopters must be used, work with USFWS and the land manager(s) to ensure measures are implemented to significantly minimize the potential for the maintenance work/access to result in adverse effects to Sonoran pronghorn (*i.e.*, access the site outside of the Sonoran pronghorn closure period; before any work commences in Sonoran pronghorn habitat, a qualified Sonoran pronghorn monitor will conduct hilltop surveys [visual and telemetry, if appropriate] for Sonoran pronghorn at sunrise in close coordination with land managers. If Sonoran pronghorn are detected within 2 miles of maintenance and maintenance access activities, no work will begin until Sonoran pronghorn move on their own volition to a distance greater than 2 miles from the activities; *etc.*).	Minimize helicopter use to the extent possible and coordinate with land manager.
39	Noise	Significantly minimize the level of construction and maintenance noise of tower projects (from construction, maintenance, and operations) within Sonoran pronghorn and lesser long-nosed bat habitat.	No reduction in habitat use or Sonoran pronghorn reproduction.
40	Noise	Significantly minimize noise levels for day and night and operations of towers and associated infrastructure and FOB within Sonoran pronghorn and lesser long-nosed bat habitat by using either baffle boxes (a sound-resistant box that is placed over or around a generator, air-conditioning unit, or any other sound producing equipment) or other noise-abatement methods for all generators, air-conditioning units, or any other sound producing equipment. Specifically, for Sonoran pronghorn, limit noise emissions from each tower so as not to exceed 35 dBA (measured ambient noise) at 492 feet distance from the noise source. Use an acoustical professional to ensure that building and/or sound barrier design details are sufficient to achieve the aforementioned criteria. Provide acoustic findings to USFWS-AESO & CPNWR, Ajo Station Tower Project, and BLM.	Noise abatement in place on generators, air-conditioning units, or any other noise-producing equipment. Measured ambient noise levels are not exceeded at 150 meters. Acoustic professional used and findings provided to DOI agencies.

41	Lights	Avoid lighting impacts during the night by conducting construction and maintenance activities during daylight hours only. If night lighting is unavoidable: 1) use special bulbs designed to ensure no increase in ambient light conditions, 2) minimize the number of lights used, 3) place lights on poles pointed down toward the ground, with shields on lights to prevent light from going up into sky, or out laterally into landscape, and 4) selectively place lights so they are directed away from all native vegetative communities.	Lighting plan developed and implemented to minimize light escapement.
42	Lights	Minimize security and other operations-related lighting impacts at tower sites and any other DHS-related infrastructure sites to the greatest extent practicable by minimizing the number of lights used and selectively placing and pointing lights down toward the ground, with shields on lights to prevent light from going up into sky, or out laterally beyond the tower site footprint.	Lighting plan developed and implemented to minimize light escapement.
43	Noise & Lights	Avoid noise impacts during the night by conducting construction and maintenance during daylight hours only. If construction or maintenance must occur during non-daylight hours, minimize the duration and frequency of these activities to the greatest extent possible.	Construction or maintenance activities occur during daylight hours only.
44	BMP Monitoring	Provide for an on-site biological monitor to be present during work activities for all construction activities in Sonoran pronghorn and lesser long-nosed bat habitats. At a time interval (*i.e.*, daily, weekly) determined by the land management agency, the monitor will check in and out of the land management unit (with the land manager or his/her representative). The biological monitor will have the following duties: ensure and document that agreed upon BMPs (both those relating to construction and protection of individuals of Sonoran pronghorn and lesser long-nosed bat on or adjacent to the project site) are properly implemented. The monitor will use a daily BMP monitoring checklist (two checklists, a construction BMP list and maintenance BMP list) to record BMP adherence and will input information from this checklist into the USFWS IPaC system every Friday (providing construction or maintenance activities occur that week). The monitor will additionally ensure a copy of this information as well as a weekly summary report is sent via electronic mail to the DOI land managers and AESO every Friday. The biological monitor will notify the construction manager who has the authority to temporarily suspend activities not in compliance with all agreed upon BMPs. The biological monitor will be notified 5 days in advance of any ground-breaking activity.	The construction manager is on site and has authority to halt activities not in compliance with BMPs.
45	Road design	Use road design and construction specifications appropriate to the local physical conditions and level of use.	Roads are constructed to design criteria.

46	Road design (erosion)	Design and construct roads according to engineering standards that avoid or minimize road bed erosion.	Post-construction monitoring will include road inspection. No erosion is observed within a year of construction.
47	Road design (hydrology & erosion)	Design new roads to minimize the risk of erosion to aquatic habitats. Avoid road placement that requires a crossing of seasonally or perennially flowing streams. If not avoidable, design crossings to minimize effects to stream banks and the channel to protect natural substrates and flows.	Stream crossings are designed and constructed to minimize effects to stream banks and channel.
48	Road installation and management (hydrology & erosion)	Avoid or minimize, through proper road design and construction, the potential for entrapment of surface flows within the roadbed due to incisement or edging berms created by grading.	Implement grading to avoid creation of flanking berms along roadway
49	Road installation and management (hydrology & erosion)	Avoid roadbed erosion and increased disturbance (inadvertent widening) along access roads resulting from improper maintenance and use.	Maintenance of existing roads does not result in widening beyond the pre-measured width.
50	Road installation and management	Measure and record the width of all access and approach roads that are created, maintained, or closed by CBP using GPS coordinates and integrate these measurements into the CBP GIS database. The database will be made available to USFWS and the affected land management agencies.	Maintain and use road database.
51	Road installation and management	Implement a road maintenance project to avoid making wind rows with the soils once grading activities are complete and use any excess soils on site to raise and shape the construction site or road surface.	Road grading will be done to avoid windrows and excess soils used on site.
52	Road installation and management	Design and locate new access roads in a manner that minimizes impacts to Sonoran pronghorn and lesser long-nosed bats species and their habitats. Corrective maintenance will be provided, as needed.	New road locations will be coordinated with land managers.
53	Road installation and management	Minimize impacts to listed species and their habitats by designating and using the minimal number of roads needed for project implementation. Avoid creating new access routes by using, and improving if necessary, existing roads.	Project design incorporated a road plan that used existing roads to the extent possible and reduced amount of new road needed.

54	Off-road vehicle activity	All vehicular traffic associated with construction and maintenance will use designated/authorized roads to access the sites, and avoiding off-road vehicle activity outside of the project footprint.	All construction and maintenance access to the site is on designated/authorized roads.
55	Routine Construction	Minimize impacts to listed species and their habitats by obtaining materials such as gravel or topsoil that are clean and acceptable to the land management agency, from existing developed or previously used sources, not from undisturbed areas adjacent to the project area.	Gravel and topsoil were obtained from existing sources not undisturbed areas near project.
56	Routine Construction	To avoid contaminating natural aquatic and wetland systems with runoff, CBP will limit all equipment maintenance, staging, laydown, and dispensing of fuel, oil, *etc.*, to designated upland areas.	Project site plan developed and implemented with designated spill and containment requirements to protect aquatic systems.
57	Routine Construction	Avoid impacts to groundwater by obtaining treated water from outside the immediate area for construction use.	Groundwater from local aquifer not used for project implementation.
58	Routine Construction	Avoid restricting water access by identifying and not creating barriers to natural water sources available to listed species.	Facilities do not block access to wildlife water sources.
59	Routine Construction - Birds	Place electric powerlines to facilities underground or on the surface as insulated, shielded wire. Shield above ground lines, transformers, or conductors as recommended by the APLIC (Avian Powerline Interaction Committee). Place raptor protection devices on all above ground wires.	Powerlines are properly sited and APLIC guidelines followed.
60	Transport of Non-native Organisms and Pathogens	Avoid the spread of non-native plants by not using natural materials (*e.g.*, straw) for on-site erosion control. Natural materials would be certified weed and weed-seed free. Herbicides not toxic to listed species that may be in the area can be used for non-native vegetation control. Application of herbicides will follow Federal guidelines and in accordance with label directions. A NPS Pesticide Use Permit will be obtained prior to applying herbicides on NPS lands.	Project plan contained source restrictions for erosion control material and site clean-up measures to address non-native plant species establishment on the site. Certified weed and weed seed free materials are used. A PUP is obtained prior to herbicide application.

61	Transport of Non-native Organisms and Pathogens	Avoid transmitting disease vectors, introducing invasive non-native species, and depleting natural aquatic systems by using wells, irrigation water sources, or treated municipal sources for construction or irrigation purposes instead of natural sources.	Water needed for project obtained from approved wells, irrigation water sources, or treated municipal supplies.
62	Transport of Non-native Organisms and Pathogens	Identify fill material brought in from outside the project area by its source location. Use sources that are clean and weed-free. Outside fill material must be approved prior to use by the land management agency.	Source of fill material identified and approved prior to use by the land management agency. Measures to reduce amount of seeds or other plant propagules in material are taken.
63	Spoils	Quantify the volume and type of spoil material from construction activities. Work with land management agency to determine disposition and location of spoil material (*e.g.*, spoils from drilling tower footers or related road construction). If requested by the land management agency, haul spoil material to an appropriate off-site disposal area. Remove material brought up from deep below the surface from conservation areas; it may support a different vegetation community than surrounding natural surface soil.	Spoil quantity and type determined and spoils removed from site as appropriate.
64	General	Remove towers within 12 months of cessation of use if CBP determines they are no longer needed. Restore site to natural habitat conditions.	Towers removed and sites restored.
65	Invasive Plant Control	As requested by the land management agency, remove invasive plants that appear on the tower sites and along sections of repaired, improved, and new road. Removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. Herbicides not toxic to listed species that may be in the area can be used for non-native vegetation control. Application of herbicides will follow Federal guidelines and in accordance with label directions. A NPS PUP would be received prior to herbicide application on NPS lands. Removal will be done in a manner that does not affect Sonoran pronghorn or lesser long-nosed bats. Training to identify non-native invasive plants will be provided for CBP personnel or contractors as necessary. Prior to construction, CBP will conduct surveys for non-native, invasive plants within tower sites and roads to be constructed, improved, or repaired to establish a baseline.	Invasive plants removed per guidance.
66	General Wildlife	Use no rodenticides.	No rodenticides used.

67	Pets	Do not, for any length of time, permit any pets inside the project area or adjacent native habitats. This BMP does not pertain to law enforcement animals.	Domestic pets not allowed on work site
68	Waste Management	All construction will follow DHS Management Directive 023.1 for waste management.	DHS management directive 023.1 for waste management is followed.
69	Waste Management	Avoid contamination of ground and surface waters by storing concrete wash water, and any water that has been contaminated with construction materials, oils, equipment residue, *etc.*, in closed containers on-site until removed for disposal. This wash water is toxic to wildlife. Storage tanks must have proper air space (to avoid rainfall-induced overtopping), be on-ground containers, and be located in upland areas instead of washes.	Water storage and disposal plan developed and implemented to control water releases.
70	Waste Management	Minimize site disturbance and avoid attracting predators by promptly removing waste materials, wrappers, and debris from the site. Any waste that must remain more than 12 hours should be properly stored until disposal.	Waste management plan containing this restrict developed and implemented.
72	Waste Management	Avoid contamination of ground and surface waters by developing and implementing stormwater management plans for every project.	Stormwater management plan developed and implemented.
73	Waste Management	Avoid soil contamination by using drip pans underneath equipment and containment zones when refueling vehicles or equipment.	Spill containment plan, calling for drip pans under vehicles and containment equipment on site, developed and implemented.
74	Waste Management	Where handling of hazardous and regulated materials does occur, collect and store all fuels, waste oils, and solvents in clearly labeled tanks and drums within a secondary containment system that consist of an impervious floor and bermed sidewalls capable of containing the volume of the largest container stored therein.	Containment structures designed and implemented as needed.
75	Waste Management	Develop and implement a spill protection plan at construction and maintenance sites to ensure that any toxic substance are properly handled and escape into the environment is prevented. Agency standard protocol should be used. Drip pans underneath equipment, containment zones used when refueling vehicles or equipment, and other measures to be included.	Spill plan developed and implemented on-site.
76	Restoration	Collect and stockpile organic material for later use in staging areas for erosion control while those areas naturally revegetate. Use only native plant material for this purpose to avoid introducing invasive plants.	Material is used as stated.

77	Restoration	Develop and implement an Erosion and Sediment Control Plan (ESCP) that includes restoration of areas of temporary impact associated with the SBI*net* Ajo-1 Tower Project. The plan will be developed in coordination with the USFWS and appropriate DOI land management agencies. The need for and extent of site restoration will be at the discretion and under the direction of the land manager. The ESCP will include provisions to re-contour the site, replace soils and provide proper drainage; replant native plants salvaged prior to construction; and revegetate with a mixture of native plant seeds or nursery plantings (or both) derived from acceptable sources as determined by the corresponding land manager. The plan will also address monitoring of establishment of non-native plants and appropriate control measures. Training to identify non-native plants will be provided to contractor personnel as needed. The plan will also identify success criteria and monitoring and reporting requirements. The plan will be finalized before the initiation of project construction.	ESCP plan developed, implemented, and achievement goals reached.
78	Project Notification	Notify USFWS and DOI land managers two weeks before any project construction and maintenance activities begin and within one week after project construction and maintenance activities are completed.	USFWS and land managers notified of project activity initiation and end in a timely manner.
79	Reporting	Provide a report including a complete description of the action (construction component) implemented (including photographs; total acres impacted; total acres of Sonoran pronghorn habitat impacted; total number of lesser long-nosed bat food plants impacted; length of time to complete the project; all environmental design [*i.e.*, BMPs] and conservation measures implemented, including all Sonoran pronghorn daily and other biological monitoring reports; *etc.*) to USFWS and DOI land management agencies within 90 days of project construction completion. As implementation of some measures will continue after project construction is completed, the report will also identify environmental design and conservation measures still under implementation or proposed for implementation and a timeframe for completing the measures. Until all environmental design and conservation measures are fully implemented, provide reports annually by February 1 to the USFWS and DOI land management agencies that describe implementation of the measures. In both the initial and the annual reports, provide a description of how well the environmental design and conservation measures worked, suggestions for improvements to the measures, and implementation of any restoration plan and monitoring post-construction.	Reports prepared and provided in timely manner.

80	Reporting – Sonoran pronghorn	Report detections (i.e., detected construction or maintenance personnel, etc.) of Sonoran pronghorn via electronic mail to FWS-AESO and the corresponding DOI land manager within 48 hours of the detection. The electronic mail will include the following details: a) if known, the coordinates and a description of the location of the where the Sonoran pronghorn was detected, b) the date and time of the detection, c) the method used to make the detection, and d) as available, other pertinent details, such as the behavior of the Sonoran pronghorn (i.e., was it standing, foraging, running, etc.)	All Sonoran pronghorn detections reported to FWS-AESO and the corresponding DOI land manager within the specified timeframe.
81	Training	Develop (in conjunction with USFWS and DOI land managers) and implement a training program focusing on Trust Resources for contractors/construction personnel. Training will be provided to all personnel associated with the project before project construction begins and before any new personnel begin work on the project. Information presented in the training program will include occurrence of sensitive species in the project area, their general ecology, and sensitivity to human activities; legal protection afforded the species and the penalties for violation of state or Federal laws; implementation of included conservation actions/BMPs; and reporting requirements. Also included in this training program will be color photos of the listed species and maps of Federally listed species' habitats. Following the training program, the photos and maps will be posted in the contractor and resident engineer's office, where they will remain through the duration of the project. The selected construction manager will be responsible for ensuring that personnel are aware of the listed species. In addition, training in identification of non-native invasive plants and animals will be provided for contracted personnel engaged in post-construction monitoring of construction sites.	Training program developed, presented, and materials displayed as required.
82	BMPs	All BMPs to be implemented by the project contractor will be included in the contract.	All BMPs to be implemented by the contractor are implemented.

Table 2. CBP/USBP operational avoidance and minimization Best Management Practices for the SBI*net* Ajo-1 tower project.

BMP No.	BMP Category*	BMP text	Success Criteria (if applicable)
1	Patrols	If CBP Border Patrol agents pursue or apprehend suspected CBVs in wilderness areas or off-road in an area not designated for such use, USBP will use the lowest impact mode of travel practicable to accomplish its mission and operate all motorized vehicles in such a manner as will minimize the adverse impacts on threatened or endangered species and on the resources and values of the particular Federal lands (MOU, page 8, IV.C.3). Officer safety is not to be compromised by the type of conveyance selected.	Lowest impact mode of travel practicable used to pursue or apprehend suspected CBVs.
2	Remote Sensors	Remote sensors will be installed with a minimum number of dedicated and trained personnel. All installation and maintenance will be performed on foot with the absolute minimum of ground disturbance. Once installed only essential maintenance will be conducted and site visits will be limited to the minimum amount practicable.	Minimal disturbance of landscape.
3	Horse Patrols	Avoid the spread of non-native plants by feeding horses that are housed or ridden near natural areas weed-free feed.	Weed-free feed used.
4	Horse Patrols	If horses are housed anywhere within OPCNM, CPNWR, or BLM lands, avoid contamination of ground and surface waters by removing animal waste from areas where horses are housed and disposing it at an appropriate waste facility.	Animal waste removal procedures implemented.
5	Aircraft	Avoid flying over lesser long-nosed bat roosts to the extent possible during the time of year in which bats are present. Avoid flying over sensitive Sonoran pronghorn areas (i.e., the captive breeding pen, pronghorn waters and forage enhancement plots, fawning areas, and areas of concentrated pronghorn use during the fawning season) to the extent possible.	USBP flights over roosts and important pronghorn areas minimized.
6	Reporting – Sonoran pronghorn	Report detections (i.e., detected by tower sensors, agents, construction or maintenance personnel, etc.) of Sonoran pronghorn via electronic mail to FWS-AESO and the corresponding DOI land manager within 48 hours of the detection. The electronic mail will include the following details: a) if known, the coordinates and a description of the location of the where the Sonoran pronghorn was detected, b) the date and time of the detection, c) the method used to make the detection, and d) as available, other pertinent details, such as the behavior of the Sonoran pronghorn (i.e., was it standing, foraging, running, etc.).	All Sonoran pronghorn detections reported to FWS-AESO and the corresponding DOI land manager within the specified timeframe.
7	Reporting – Sonoran pronghorn	Report all vehicular collisions with Sonoran pronghorn to FWS-AESO and the corresponding DOI land manager via telephone and electronic mail as soon as practicable but no later than 12 hours after the collision. Information relayed will include the following details: a) coordinates and a description of the location where the collision occurred, including whether it occurred on or off an authorized road, b) the date and time of the collision, c) the type of vehicle, d) a photograph of the pronghorn, if available and authorized, e) if known, a description of the outcome of the collision with regard to the pronghorn (i.e., did the pronghorn die, run-off, etc.). To avoid conflict with ongoing USBP apprehensions,	All vehicular collisions with Sonoran pronghorn reported to FWS-AESO and the corresponding DOI land manager within the specified timeframe.

7		pursuits, or investigations, FWS-AESO will coordinate with the USBP Patrol Agent in Charge, Ajo Station, prior to visiting sites of reported collisions with Sonoran pronghorn.	
8	Training	Appropriate training for USBP agents focusing on Trust Resources, as addressed in the MOU (page 7, IV.B.7), will be provided by DOI agencies and formatted to meet operational constraints.	Training program developed by DOI agencies.

Offsetting Measures

The following offsetting measures were developed through coordination with DOI agencies and land managers to offset potential impacts to Sonoran pronghorn and lesser long-nosed bat from the project. CBP will prepare and submit a commitment letter for funding prior to the release of the final BO.

Offsetting Measures for Sonoran Pronghorn

1. Unauthorized Vehicle Route (UVR) Assessment and Restoration

   a. UVR ASSESSMENT: SBI*net* will provide $200,000 to DOI by the initiation of the SBInet Ajo-1 Tower Project construction to assess and map the number and extent of unauthorized, repetitively used UVRs in Sonoran pronghorn habitat or potential habitat on CPNWR, OPCNM, and BLM lands within or in close proximity to the Ajo 1 project area. This assessment will locate, record, and map UVR occurrences throughout pronghorn habitat within the project area. The assessment will also quantify UVR dimensions and severity as well as determine restoration potential and needs. The assessment will be conducted by DOI in years one and two (from the initiation of project construction). Additionally, CBP and DOI will investigate the possibility of using existing remote sensing technology to supplement or replace a portion of SBI*net*'s funding for this assessment. Further, CBP and DOI will work together to improve the reporting of off-road incursions that occur within Sonoran pronghorn habitat and wilderness.

   b. UVR CLOSURE AND RESTORATION: SBI*net* will provide $1,750,000 in funding to DOI to close and restore UVRs documented as a result the UVR assessment. DOI will prioritize areas to close and restore based on importance of the areas to Sonoran pronghorn and on CBP information regarding anticipated continued use of UVRs (i.e., UVRs that will likely continue to be used by USBP due to emergency and exigent circumstances will receive a lower restoration priority as restoration in continuously used areas will not likely be successful). DOI will conduct the restoration work in years 2 through 5 (from the initiation of project construction) or beyond, depending on the feasibility of restoration determined by the land management agencies.

   c. UVR REASSESSMENT: CBP and DOI will cooperatively reassess the issue of UVRs within Sonoran pronghorn habitat and wilderness after 5 years (2014) and will resume discussions concerning evaluation of success of these efforts.

2. Vehicular use of the pole-line road (TCA-AJO-170) will continue to be only for exigent circumstances per the 2006 MOU. Routine patrols will occur along SH 85. Additionally, a horse staging area will be established outside of wilderness in the 66 Hills / Alamo Canyon wash area of OPCNM. DOI will work with CBP to establish this horse staging area, the exact size and location of which, along with any associated infrastructure, will be mutually agreed upon in writing prior to its establishment. The intent of this horse staging area is to support CBP horse patrol operations in and around the Valley of the Ajo. Every effort will be made to limit the overall area of disturbance while maximizing safety and the adequacy of the site towards meeting its intended purpose.

3. Consistent with the MOU, USBP will conduct patrol activities by horseback to the greatest extent practicable within the Sonoran pronghorn range, particularly from March 15 to July 31 (the Sonoran pronghorn closure season). DHS will follow all horse patrol BMPs coordinated with resource agencies (i.e., feed horses weed free pellets).

4. CBP will fund a portion of AGFD Sonoran pronghorn aerial monitoring efforts for 5 years. Funding will be provided for one employee for 5 years, purchase of collars and collaring costs for five Sonoran pronghorn, and 100 tracking flights (20 per year for 5 years). Total Funding: $346,000.

5. CBP will contract for cultural surveys at two proposed forage enhancement sites for Sonoran pronghorn on BLM lands. One site is located at UTM 0320443 x 3564606 and the second is located at Cameron Tank. The sites are approximately 12 acres each. Total Cost: $17,000.

6. CBP will provide funding for three full-time personnel (1 @ $70,000 per year for 4 years [USFWS will fund the 5th and final year] and 2 @ $60,000 per year for 5 years) for 5 years to: 1) monitor the effects of human activities on Sonoran pronghorn; 2) conduct surveys for and monitoring of Sonoran pronghorn; and 3) implement other Sonoran pronghorn recovery activities. Employees will implement the aforementioned activities within the action area. CBP will also provide funding for Sonoran pronghorn recovery projects (i.e., collars and collaring costs for 25 pen raised Sonoran pronghorn [$137,000], 3 water tanks [$60,000], and 1 forage enhancement plot [$215,000]). Total Funding: $1,292,000.

7. CBP will provide funding to move pronghorn back into the Valley of the Ajo if they do not move on their own within 3 years (by September 2012). Total Funding: $20,000.

8. CBP will provide funding to assist with the establishment of a second Arizona Sonoran pronghorn population in southern Arizona. Funding will be for: purchase of pen materials and construction, transport of Sonoran pronghorn from CPNWR (from captive breeding pen) to the identified second population area, and other establishment projects as determined by the Sonoran Pronghorn Recovery Team. Total Funding: $470,000.

9. CBP will provide funding to AGFD to conduct weekly aerial surveys for Sonoran pronghorn throughout the fawning season of 2010. AGFD will conduct aerial surveys to assist CBP monitor Sonoran pronghorn at sites where project work will be conducted during the fawning season. Total cost: $14,000.00 [plus FWS or NFWF overhead costs].

10. CBP will provide funding to OPCNM to develop and operate 5 temporary/emergency food and water plots for Sonoran pronghorn for 6 months. The purpose of these plots is to lure pronghorn away from tower sites and to buffer effects of disturbance on Sonoran pronghorn. If range conditions are determined by the Sonoran Pronghorn Recovery Team to be good, these measures would not be necessary. Cost estimate: $1000.00 per site ($5,000 total) and $18,000 for one GS-5 employee for 6 months. Total cost: $23,000.00 [plus FWS or NFWF overhead].

Offsetting Measures for Lesser Long-nosed Bat

1. CBP will provide funding for monitoring Copper Mountain and Bluebird Mine lesser long-nosed bat maternity roosts. Total Funding: $35,000 ($3,500 for each site for 5 years).

2. CBP will provide funding for a study to identify unknown roosts and to determine roost occupancy patterns of all roosts in the Action Area. Total Funding: $140,000 ($70,000 per year for two years).

3. CBP will develop and implement a monitoring plan and program to document and assess tower related mortality and injury of lesser long-nosed bats beginning once tower construction is completed (this will likely correspond to the 2010 lesser long-nosed bat season) and continuing five years after the towers are operational. Monitoring will be conducted at an appropriate sample of tower sites where monitoring does not conflict with Sonoran pronghorn conservation measures; these sites will be determined by FWS and the land management agencies. The monitoring plan will be developed with and approved by FWS and the land management agencies before construction is completed. If lesser long-nosed bat mortality or injury is documented at tower sites, CBP shall a) notify FWS and the land management agencies in writing (via electronic mail) within 48 hours, b) work with FWS and the land management agencies to develop site-specific measures to reduce mortality and injury, and c) continue monitoring beyond the five years until project-related mortality and injury is reduced as described below. CBP will, in coordination with FWS, use information gained from monitoring to develop tower retrofits to reduce lesser long-nose bat mortality and injury, if collisions are documented; and incorporate the bat mortality and injury monitoring associated with the proposed action into an annual report for a minimum of five years. If no take is documented, as stated above, monitoring will no longer be required five years after the towers are operational. If take occurs at or below authorized levels within year one through three: DHS will implement measures to reduce mortality and injury the same year take is documented and will continue to monitor until the end of the original five-year period. If take occurs during year four or five, DHS will implement measures to reduce mortality the same year take is documented and will continue to monitor for two years after the take is documented and measures implemented. If at any point, take exceeds the amount anticipated in this biological opinion, DHS shall reinitiate formal consultation as stated in the Reinitiation Notice below.

SONORAN PRONGHORN
STATUS OF THE SPECIES

The Sonoran subspecies of pronghorn (*Antilocapra americana sonoriensis*) was first described by Goldman (1945) and is the smallest of the four subspecies of pronghorn (Nowak and Paradiso 1983, Brown and Ockenfels 2007). The subspecies was listed throughout its range as endangered on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 without critical habitat. Three sub-populations of the Sonoran pronghorn are extant: 1) a U.S. sub-population in southwestern Arizona, 2) a sub-population in the Pinacate Region of northwestern Sonora, and 3) a sub-population on the Gulf of California west and north of Caborca, Sonora. The three sub-populations are predominantly geographically isolated due to barriers such as roads and fences, and in the case of the two Sonora sub-populations, by distance.

The 1982 Sonoran Pronghorn Recovery Plan (U.S. Fish and Wildlife Service 1982) was revised in 1998 (U.S. Fish and Wildlife Service 1998). The recovery criteria presented in the revised plan entailed the establishment of a population of 300 adult pronghorn in one self-sustaining population for a minimum of five years, as well as the establishment of at least one other self-sustaining population in the U.S. to reclassify the subspecies to threatened. Actions identified as necessary to achieve these goals include the following: 1) enhance present sub-populations of pronghorn by providing supplemental forage and/or water; 2) determine habitat needs and protect present range; 3) investigate and address potential barriers to expansion of presently used range and investigate, evaluate, and prioritize present and potential future reintroduction sites within historical range; 4) establish and monitor a new, separate herd(s) to guard against catastrophes decimating the core population, and investigate captive breeding; 5) continue monitoring sub-populations and maintain a protocol for a repeatable and comparable survey technique; and 6) examine additional specimen evidence available to assist in verification of taxonomic status. In 2001 a supplement and amendment to the 1998 Final Revised Sonoran Pronghorn Recovery Plan was prepared (U.S. Fish and Wildlife Service 2001). We concluded that data do not yet exist to support establishing delisting criteria. Tasks necessary to accomplish reclassification to threatened status (as outlined in the 1998 plan) should provide the information necessary to determine if and when delisting will be possible and what the criteria should be.

B. Life History and Habitat

Sonoran pronghorn inhabit one of the hottest and driest portions of the Sonoran Desert. They forage on a large variety of perennial and annual plant species (Hughes and Smith 1990, Hervert *et al.* 1997b, U.S. Fish and Wildlife Service 1998). During drought years, Hughes and Smith (1990) reported cacti were the major dietary component (44 percent). Consumption of cacti, especially chain fruit cholla (*Cylindropuntia fulgida*, Pinkava 1999), provides a source of water during hot, dry conditions (Hervert *et al.* 1997b). Other important plant species in the diet of the pronghorn include pigweed (*Amaranthus palmeri*), ragweed (*Ambrosia* sp.), locoweed (*Astragalus* sp.), brome (*Bromus* sp.), and snakeweed (*Gutierrezia sarothrae*) (U.S. Fish and Wildlife Service 1998). Pronghorn will move in response to spatial limitations in forage availability (Hervert *et al.* 1997a). Water intake from forage is not adequate to meet minimum water requirements (Fox *et al.* 2000), hence pronghorn need and readily use both natural and artificial water sources (Morgart *et al.* 2005).

Sonoran pronghorn rut during July-September, and does have been observed with newborn fawns from February through May. Parturition corresponds with annual spring forage abundance. Fawning areas have been documented in the Mohawk Dunes and the bajadas of the Sierra Pinta, Mohawk, Bates, Growler, and Puerto Blanco mountains. Does usually have twins, and fawns suckle for about two months. Does gather with fawns, and fawns sometimes form nursery groups (U.S. Fish and Wildlife Service 1998). Sonoran pronghorn form small herds of up to 21 animals (Wright and deVos 1986).

Telemetry locations of 35 Sonoran pronghorn demonstrated that during 1995-2002, pronghorn used creosote/bursage and palo verde/mixed cactus vegetation associations less than expected or equal to availability. Pronghorn use of palo verde/chain fruit cholla associations and desert washes occurred more than expected. However, during the cool and wet winter on 1997-1998, pronghorn were found in creosote/bursage associations more than expected (Hervert *et al.* 2005). In contrast, during 1983-1991, pronghorn used creosote/bursage and palo verde mixed cacti associations more than expected (deVos and Miller 2005). Differences between these study results may be due in part to differences in precipitation and forage patterns between these periods. The earlier period was wetter with greater forage availability in flats and valleys where creosote/bursage associations predominate. In wet winters and early spring pronghorn are often found in flats and valleys, such as Pinta Sands, the Mohawk Dunes west of the Mohawk Mountains, and the west side of the Aguila Mountains. In late spring and summer, pronghorn then move from the flats and valleys upslope into bajadas and often south or southeast where palo verde associations, chain fruit cholla, and washes are more common. Movements are most likely motivated by the need for thermal cover provided by leguminous trees and water available in succulent chain fruit cholla (Hervert *et al.* 1997b). Home range size of Sonoran pronghorn during 1995-2002 ranged from 16.6 to 1,109 mi^2, with an average of 197 $\pm$ 257 mi^2 (Hervert *et al.* 2005).

From 1995-2002, adult mortality rates varied from 11-83%. Adults were killed by coyotes, bobcats, mountain lions, capturing efforts, drought, and unknown causes (Bright and Hervert 2005). However, during 1983-1991, apparently a more favorable period for pronghorn during which the population grew significantly, mean annual survival of females and males was 96% $\pm$ 0.04 and 92% $\pm$ 0.04 (deVos and Miller 2005). Disease may affect mortality, but has not been thoroughly investigated (Bright and Hervert 2005). Hervert *et al.* (2000) found that the number of fawns surviving until the first summer rains was significantly correlated to the amount of preceding winter rainfall, and negatively correlated to the number of days without rain between the last winter rain and the first summer rain. Drought may be a major factor in the survival of adults and fawns (Bright and Hervert 2005). Three radio-collared pronghorn died in July and August of 2002 with no obvious cause of death. Given that 2002 was one of the driest years on record, the proximate cause of these mortalities was likely heat stress and/or malnutrition resulting from inadequate forage conditions due to drought.

C. Distribution and Abundance

United States

Historically, the Sonoran pronghorn ranged in the U.S. from approximately the Santa Cruz River in the east, to the Gila Bend and Kofa Mountains to the north, and to Imperial Valley, California,

to the west (Mearns 1907, Nelson 1925, Monson 1968, Wright and deVos 1986, Paradiso and Nowak 1971; Figure 5). Bright *et al.* (2001) defined the present U.S. range of the Sonoran pronghorn as bordered by Interstate 8 to the north, the International Border to the south, the Copper and Cabeza mountains to the west, and SR 85 to the east (see Figure 6). This area encompasses 2,508 mi^2 (Bright *et al.* 2001).

While Mearns (1907) suggested that pronghorn may have been common in some areas in the late 1800s, evidence suggests that the sub-population declined dramatically in the early 20^{th} century. Sub-population estimates for Arizona, which only began in 1925, have never shown the pronghorn to be abundant (Table 3). Repeatable, systematic surveys were not conducted in Arizona until 1992. Since 1992, Sonoran pronghorn in the United States have been surveyed biennially (Bright *et al.* 1999, 2001) using aerial line transects (Johnson *et al.* 1991). Sub-population estimates from these transects have been derived using three different estimators (Table 4); currently the sightability model (Samuel and Pollock 1981) is considered the most reliable estimator (Bright *et al.* 1999, 2001). Table 4 presents observation data from transects and compares estimates derived from the different population models from 1992 through 2006.

The sightability model population estimates from 1992 to 2000 showed a 45 percent decrease in sub-population size (Table 4). The estimates indicate a steady decline in sub-population size, with the exception of the 1994 survey. The 1994 estimate may be somewhat inflated due to inconsistencies in survey timing (U.S. Fish and Wildlife Service 1998, Bright *et al.* 2001). High fawn mortality in 1995 and 1996 and the death of half (8 of 16) of the adult, radio-collared pronghorn during the 13 months preceding the December 1996 survey corresponded to five consecutive six-month seasons of below normal precipitation (summer 1994 through summer 1996) throughout most of the Sonoran pronghorn range, which likely contributed, in part, to observed mortality (Bright *et al.* 2001, Hervert *et al.* 1997b).

Mortality of Sonoran pronghorn in 2002 was exceptionally high (Bright and Hervert 2005). At the start of the year, seven radio-collared Sonoran pronghorn were at large in the U.S. sub-population. By December 2002, all but one of these had died. For most, drought stress was considered to be the proximate cause. For those animals that may have succumbed to predation, it was suspected that drought stress was again a factor, by making the animal more vulnerable to predation, due to an emaciated physical condition and being forced into predator habitats by drought. The 2002 drought was one of the driest on record. As an example, annual rainfall at the OPCNM visitor center was only 2.54 inches in 2002 (T. Tibbitts, Organ Pipe Cactus NM, pers. comm. 2002); *average* annual rainfall for the visitor center is 9.2 inches (Brown 1982). The November/December 2002 population survey revealed the U.S. sub-population had declined to the lowest level ever recorded. A total of 18 pronghorn were observed, in three groups (8, 9, and 1). The sightability model resulted in a population estimate of 21 animals, or a 79% decline from 2000. Also, very few fawns survived in 2002 to replace these dying adults.

Although drought was likely the proximate cause of the dramatic decline of the U.S. sub-population in 2002, anthropogenic factors almost certainly contributed to or exacerbated the effects of the drought. Historically, pronghorn likely moved to wetted areas and foraged along the Río Sonoyta, Sonora, and the Gila and probably Colorado rivers during drought. These areas are no longer accessible to the U.S. population due to fences, Interstate 8, Mexico Highway 2,

and other barriers. The rate of decline in the U.S. sub-population from 2000-2002 (79 percent) was also much greater than that observed in either the sub-population southeast of Highway 8 (18 percent decline) or the El Pinacate sub-population (26 percent) during the same period (see discussion of Mexican sub-populations in the next section). Observations of forage availability suggest the El Pinacate sub-population experienced the same severe drought that occurred on the Arizona side (T. Tibbitts, J. Morgart, pers. comm. 2003). Yet that sub-population fared much better than its U.S. counterpart. The high level of human activities and disturbance on the U.S. side, particularly in regard to undocumented alien traffic, smugglers, and required law enforcement response, as compared to what occurs in the El Pinacate area, is a likely contributing factor in the differing rates of decline observed north and south of the border. See the section entitled "Drought" in the Environmental Baseline and "Cumulative Effects" for further discussion.

The December 2004, 2006, and 2008 aerial surveys resulted in an estimated 58, 58, and 68, respectively, wild pronghorn in the U.S. sub-population (Tables 3 and 4), a substantial increase brought on by the implementation of emergency recovery measures and improved conditions (as a result of increased rainfall) since 2002. The latter two estimates included a number of captive-born individuals that were released into the wild (see below). Also, though the exact ratio is unknown, during the 2008 survey, observers noted a skewed sex ratio with more males than females; this affects the rate at which the population may increase. Immediately after the 2008 survey, three does were captured and collared and one buck was captured but died to due capture myopathy. Though the U.S. Sonoran pronghorn population has increased significantly since 2002, the increase is not as great as the Sonoran Pronghorn Recovery Team (Team) had predicted given the adequate to favorable range conditions since 2002 as well as tremendous multi-agency recovery efforts, including providing waters and forage enhancement plots, implementing seasonal restrictions on public access to pronghorn habitat during the critical fawning season, and a captive breeding program. The Team asserts that this slow pronghorn population growth (caused by low fawn recruitment) is likely correlated with high CBV and USBP activity within the pronghorn range. Strong evidence of this correlation has been seen during the biennial aerial surveys, where since 2000, off-road vehicle tracks have been seen progressively increasing in extent and density, throughout the pronghorn's range U.S. range (electronic mail from Tim Tibbitts, Organ Pipe Cactus National Monument and member of the Sonoran Pronghorn Recovery Team, September 21, 2009). It has been well documented that human presence in wildlands can disturb animals, causing them to unnecessarily expend energy avoiding people, thereby potentially reducing reproductive success (e.g., Manville 1983, van Dyke *et al*. 1986, Goodrich & Berger 1994, Primm 1996; as cited by Kerley *et al*. 2002) or increasing the likelihood of fatal encounters with humans (Kasworm & Manley 1990, Saberwal *et al*. 1994, Khramtsov 1995, Mattson et al. 1996; as cited by Kerley *et al*. 2002). Failure of the wild U.S. pronghorn population to exceed 100 animals since the 2002 population decline is considered by many Team members to be evidence that acute adverse impacts from CBV and USBP activity, particularly off-road driving, continue to affect the population, inhibiting its ability to recover.

Semi-captive breeding facility

As part of a comprehensive emergency recovery program, a total of 11 adult pronghorn (10 females and one male) were initially captured (from Sonora and Arizona) and placed into a semi-

captive breeding pen at CPNWR in 2004. The breeding program has been very successful and there are currently (as of August 2009) 74 pronghorn in the enclosure. Since establishing the program, nine pronghorn, primarily juveniles, yearlings, and two-year olds, have died in the pen due to various causes, including epizootic hemorrhagic disease. Additionally, two young bucks in the pen died in 2008 due to capture and release efforts. Sonoran pronghorn have been released from the pen every year since 2006; as of October 2009, a total of 21 individuals, primarily males, have been released. Thirteen of these are known to still be alive.

The objective is to produce at least 20 fawns each year to be released into the U.S. sub-population, and potentially to establish a second U.S. sub-population, possibly at Kofa NWR. Planning for the second herd is underway. Various alternatives are being considered, but a second herd could be established in King Valley of Kofa NWR within two years. A captive facility with a forage enhancement plot, and development of waters in King Valley would likely be needed. The population would probably be introduced as an experimental, nonessential population under section 10(j) of the Act. A draft Environmental Assessment and draft 10(j) rule are scheduled to be available for public review and comment by October 2009.

Mexico

Historically, Sonoran pronghorn ranged in Sonora from the Arizona border south to Hermosillo and Kino Bay, west to at least the Sierra del Rosario, and east to the area south of the Baboquivari Valley on the Tohono O'odham Nation (Nelson 1925, Carr 1974, Monson 1968). The distribution in Baja California is less clear, but observations by Mearns (1907) indicate they occurred in the Colorado Desert west of the Colorado River, as well. Sonoran pronghorn are currently extant in two sub-populations in Mexico, including: (1) Pinacate sub-population west of Highway 8 near the Pinacate Lava flow; and (2) north and west of Caborca and southeast of Highway 8.

Sub-populations of Sonoran pronghorn in Sonora had not been thoroughly surveyed until the December 2000 surveys (Bright *et al.* 2001), at which time 346 pronghorn were estimated to occur in Sonora. Although the 1993 estimate was approximate, survey results suggested a decline in the sub-populations of 16 percent from 1993 to 2000 (Table 5). Since 2000, the two Mexico sub-populations have been resurveyed biennially, with the exception of the winters of 2004/05 and 2005/06, when they were surveyed both years. In December 2002, a total (both El Pinacate and southeast of Highway 8) of 214 pronghorn in 32 groups were seen for a tentative population estimate of 280, indicating further decline. Only 19 pronghorn were observed in the Pinacate area for an estimate of 25, which is a decline of 26% from the 2000 estimate. Surveys conducted in December 2004 and February 2005 demonstrated that the population southeast of Highway 8 increased to 625 (439 observed), while the Pinacate population increased to 59 (30 observed) (684 total estimated, 469 total observed). In 2004, several capture-related mortalities occurred in Sonora associated with efforts to capture pronghorn to stock the breeding pen in Arizona. Since then, capture protocols were examined and improved. In January 2006, surveys indicated that pronghorn numbers remained relatively steady with an estimated total of 634 (486 observed) individuals (combined for both populations). Nine of these were captured, of which five were fitted with radio-collars and released and four were transferred to the semi-captive breeding facility in the U.S. In December 2007, surveys indicated pronghorn numbers declined with an estimated total of 404 (360 observed) individuals combined for both sub-populations

(including 354 pronghorn [325 observed] in the area southeast of Mexico Highway 8 and 50 [35 observed] to the west of the highway). Of these pronghorn, four pronghorn (three does and 1 buck) from the Pinacate Biosphere Reserve were captured and fitted with GPS radio collars. The male was found dead during a subsequent telemetry flight; his death was likely capture-related as his temperature rose dangerously high during the collaring effort. The decrease in Sonoran pronghorn population in Sonora from 2006 to 2007 is likely attributable, at least in part, to drought conditions in the pronghorn range in Mexico. During the aerial surveys, observers noted many extremely dry areas and some areas where the vegetation appeared dead in the pronghorn range. Additionally, an increasing number of fences and mine expansion within the range of the southeastern pronghorn population may be adversely affecting this population.

Population Viability Analysis

In 1996, a workshop was held in which a population viability analysis (PVA) was conducted for the U.S. sub-population of Sonoran pronghorn (Defenders of Wildlife 1998). A PVA is a structured, systematic, and comprehensive examination of the interacting factors that place a population or species at risk (Gilpin and Soulé 1986). Based on the best estimates of demographic parameters at the time, the likelihood of extinction of Sonoran pronghorn was calculated as one percent in the next 25 years, nine percent in the next 50 years, and 23 percent in the next 100 years. More severe threats include population fluctuation, periodic decimation during drought (especially of fawns), small present population size, limited habitat preventing expansion to a more secure population size, and expected future inbreeding depression. At populations of less than 100, population viability declined at an increasingly steep rate. To maintain genetic diversity over the long term, a population of at least 500 is desirable (Defenders of Wildlife 1998). The likelihood of extinction increased markedly when fawn mortality exceeded 70 percent. Thus, a 30 percent fawn crop (30 fawns/100 does) each year is necessary to ensure the continuance of the U.S. sub-population. The authors concluded that "this population of the Sonoran pronghorn, the only one in the U.S., is at serious risk of extinction." The authors made these conclusions prior to the severe drought and decline in the species in 2002. On the other hand, Hosack *et al*. (2002) found that some management actions were possible that could improve the chances of population persistence significantly. Actions that would ameliorate the effects of drought or minimize mortality of pronghorn were of particular importance for improving population persistence.

D. Threats

Barriers that Limit Distribution and Movement

Highways, fences, railroads, developed areas, and irrigation canals can block access to essential forage or water resources. Brown and Ockenfels (2007) report that numerous railroad and highways bisect what was former contiguous pronghorn habitat, often dividing these rangelands into parcels too small to support, viable, long-term populations of pronghorn in Arizona. Furthermore, they state railroads and paved highways are especially restrictive, as in addition to acting as intimidating barriers in their own right, they are often fenced on both sides of the right-of-way. Highways 2 and 8 in Sonora, and SR 85 between Gila Bend and Lukeville, Arizona support a considerable amount of fast-moving vehicular traffic, are fenced in some areas, and are likely a substantial barrier to Sonoran pronghorn (one pen-raised radio-collared male crossed SR 85 and Mexican Highway 2 recently; however, this is considered highly unusual). Interstate 8,

the Wellton-Mohawk and Palomas Canals, agriculture, a railroad, and associated fences and human disturbance near the Gila River act as barriers for northward movement of pronghorn. De-watering of reaches of the Río Sonoyta and lower Gila River have also caused significant loss of habitat and loss of access to water (Wright and deVos 1986). Agricultural, urban, and commercial development at Sonoyta, Puerto Peñasco, and San Luis Río Colorado, Sonora; in the Mexicali Valley, Baja California; and at Ajo, Yuma, and along the Gila River, Arizona, have further removed habitat and created barriers to movement.

Human-caused Disturbance

A variety of human activities occur throughout the range of the pronghorn that have the potential to disturb pronghorn or its habitat, including livestock grazing in the U.S. and Mexico; military activities; recreation; poaching and hunting; clearing of desert scrub and planting of buffelgrass (*Pennisetum ciliare*) in Sonora; gold mining southeast of Sonoyta, dewatering and development along the Gila River and Río Sonoyta; CBV activity across the international border and associated required law enforcement response; and roads, fences, canals, and other artificial barriers.

Of the aforementioned human activities, in the U.S. range of the pronghorn, CBV activity and required law enforcement response is the most significant current source of disturbance to Sonoran pronghorn and its habitat. As a result of increased presence of the USBP in the Douglas, Arizona area, and in San Diego (Operation Gatekeeper) and southeastern California, CBV traffic has shifted into remote desert areas, such as CPNWR, OPCNM, and BMGR (Klein 2000). In 2001, estimates of CBVs reached 1,000 per night in OPCNM alone (Organ Pipe Cactus National Monument 2001), and an estimated 150,000 people entered the monument illegally from Mexico (Milstead and Barns 2002). In fiscal years (FY) 2006 and 2007, OPCNM rangers apprehended 171 and 180 CBVs, respectively. Apprehensions of CBVs by the USBP Ajo Station, Tucson Sector, increased from 21,300 in 1999 to 22,504 in 2006 (USBP Ajo Station's apprehensions also reflect those apprehension made by OPCNM rangers as CBVs were transferred from OPCNM rangers to USBP agents for processing). In FY 2008, a total of 15,462 apprehensions were made by the Ajo Station USBP. The trend in apprehensions and drive-throughs in the Ajo Station's overall AOR has declined in recent years, particularly after the construction of the vehicle fence. An increase in the number of apprehensions and drive-throughs in the specific Ajo-1 project area increased from 2008 to 2009. This increase is believed to be attributable to increased CBV activity, as well as increased USBP effort, tactical infrastructure, and technology in the area which have improved USBP's ability to detect and apprehend CBVs (personal communication with USBP, December 2, 2009).

In fiscal year 2005, the Yuma Sector of the USBP apprehended record numbers of CBVs, and from October 1, 2005 to May 2006, 96,000 arrests were made, which was a 13% increase over the same time period in 2005 (Gerstenzang 2006). The Wellton Station of the Yuma USBP Sector made 2,080 apprehensions in fiscal year 2005 and 3,339 apprehensions from October 2005 to February 2006 (personal communication with USBP, February 10, 2006). USBP officials have indicated, however, that apprehensions in recent years have dramatically declined in the Yuma Sector, particularly in the western portions of the sector, due to USBP presence at Camp Grip, increased numbers of agents, and recently completed tactical infrastructure.

As USBP has been able to successfully gain control of more urban areas, CBV activity has shifted to more remote areas, such as CPNWR and OPCNM. Both CBV and USBP activities have resulted in increased human presence in and widespread degradation of Sonoran pronghorn habitat. Much of the CBV traffic travels through the southern passes of the Growler Mountains that lead either through or by all of the forage enhancements and the captive rearing pen in the Child's Valley, with potential to impact these recovery projects and use of the area by pronghorn (personal communication with Curtis McCasland, CPNWR, 2007). There is strong anecdotal evidence that pronghorn are avoiding areas of high CBV traffic and law enforcement activities (personal communication with Curtis McCasland, CPNWR, 2007). For example, prior to 2002 Sonoran pronghorn used the 90,000 acre Valley of the Ajo extensively during the fawning period (March 15-July 31); they primarily entered the Valley through an extremely critical and narrow mountain pass located near Bates Well. During the winter of 2001-2002, NPS stationed a ranger at Bates Well in a small (about 18-foot) temporary FEMA trailer, with no outdoor lighting or generators, to provide visitor security in the north part of OPCNM during the park's peak visitation period, which occurs prior to the Sonoran pronghorn fawning period. Beginning in 2002, USBP began to use the Bates Well site (i.e., Bates Well FOB) seasonally during the summer months. The NPS continued to use Bates Well for short periods during the late fall and winter in support of coordinated law enforcement efforts until ultimately discontinuing its use entirely in 2005. Because pronghorn traditionally used the Bates Well and Valley of the Ajo areas during the spring and summer months, it is unlikely that the NPS fall and winter presence at Bates Well between 2001 and 2005 had a significant effect on pronghorn use of the area. Since 2005, USBP has been the sole occupant at Bates Well. Over time USBP occupancy of this site has increased (the site can accommodate eight people) and today it is occupied nearly year round. Furthermore, USBP brought in generators that now run continuously and lights that operate throughout the night. Subsequent to the establishment of the FOB, no pronghorn have been documented entering the Valley of the Ajo through the Bates Well migration corridor. The establishment of the FOB coincides with a drastic decline in pronghorn (attributable to drought and an increase in border activity); therefore, changes in use of Bates Well area by pronghorn may be in part due to decreased population size, however the increased human presence at Bates Well, particularly during the fawning period, may have acted to prevent Sonoran pronghorn movements through the area and into the Valley of the Ajo. Since 2002, the population has increased and pronghorn continue to avoid the Bates Well migration corridor. Considering the sensitivity of pronghorn to human activity and the ongoing use of the Bates Well, it is likely that pronghorn are avoiding use of the area due to the high level of human activity currently associated with the site. In spring of 2009, it is thought that three does with fawns abandoned the Granite FEP due to the high amount of USBP activity at the site (a USBP drag road crosses adjacent to the FEP – it was created after the development of the FEP (electronic mail from John Hervert, AGFD, September 16, 2009). The does were later observed at OPCNM; however, the fawns died (electronic mail from John Hervert, AGFD, September 16, 2009).

As stated above, it has been well documented that human presence in wildlands can disturb animals, causing them to unnecessarily expend energy avoiding people, thereby potentially reducing reproductive success (e.g., Manville 1983, van Dyke *et al*. 1986, Goodrich & Berger 1994, Primm 1996; as cited by Kerley *et al*. 2002) or increasing the likelihood of fatal encounters with humans (Kasworm & Manley 1990, Saberwal *et al*. 1994, Khramtsov 1995, Mattson et al. 1996; as cited by Kerley *et al*. 2002). Range abandonment has been documented in response to

human disturbance (Jorgenson 1988), and investigators have shown that heart rate increases in wildlife in response to auditory or visual disturbance in the absence of overt behavioral changes (Thompson *et al.* 1968, Cherkovich and Tatoyan 1973, Moen *et al.* 1978). Studies of captive pronghorn, other than the Sonoran subspecies, have shown that they are sensitive to disturbance such as human presence and vehicular noise. Human traffic, such as a person walking or running past pronghorn in an enclosed pen, a motorcycle driving past, a truck driving past, a truck blowing its horn while driving past, or a person entering a holding pen, caused an increased heart-rate response in American pronghorn in half-acre holding pens (Workman *et al.* 1992). The highest heart rates occurred in female pronghorn in response to a person entering a holding pen, or a truck driving past while sounding the horn. The lowest heart rates occurred when a motorcycle or truck was driven past their pen. Pronghorn were more sensitive to helicopters, particularly those flying at low levels or hovering, than fixed wing aircraft. Luz and Smith (1976) observed pronghorn reactions to overhead helicopter flights which suggested mild disturbance (muscle tensing and interruption of grazing) by helicopter noise levels at approximately 60 dBA and strong reaction (running) at approximately 77 dBA.

In Sonoran pronghorn, Hughes and Smith (1990) found that pronghorn immediately ran 1,310-1,650 feet from a vehicle. Krausman *et al.* (2001, 2004, 2005a) examined effects of military aircraft and ground-based activities on Sonoran pronghorn at the North and South TACs on the Barry M. Goldwater Range (BMGR) and concluded that military activities, both ground-based and aerial, were associated with some changes in behavior (e.g., from standing to trotting or running, or bedded to standing) but the authors concluded that these changes were not likely to be detrimental to the animals. However, sightings of Sonoran pronghorn were biased towards disturbed habitats on the TACs and other areas of military activities, which also corresponded to areas of favorable ephemeral forage production (Krausman *et al.* 2005a). No conclusions could be drawn about effects of military activities on fawns due to poor fawn productivity during the Krausman *et al.* study. During times of drought, disturbances that cause pronghorns to startle and run would energetically have a more significant effect. Such energetic expenditures, particularly during times of stress, may lead to lower reproductive output and/or survival of individual animals (Geist 1971). Landon *et al*. (2003) evaluated whether Sonoran pronghorn used areas, as defined by noise levels produced by military aircraft, in proportion to their availability on the BMGR. In general, they found that Sonoran pronghorn used the lowest noise level area more than the higher noise level areas.

Habitat Disturbance

Livestock grazing has the potential to significantly alter pronghorn habitat and behavior (Leftwich and Simpson 1978, Kindschy *et al.* 1982, Yoakum *et al.* 1996). Overgrazing well into the 19th century by Spaniards and their descendants caused widespread habitat changes throughout much of the Sonoran Desert, particularly in more settled areas such as central Sonora, Mexico (Sheridan 2000). The effects of cattle grazing are largely historical; cattle were removed from OPCNM, CPNWR, and the BMGR in 1979, 1983, and 1986, respectively (U.S. Fish and Wildlife Service 1998, Rutman 1997). In 2004, the BLM closed the Cameron Allotment on the borders of CPNWR and OPCNM, but grazing still occurs in the nearby Childs and Coyote Flat allotments near Ajo. In Sonora, livestock grazing occurs at Pozo Nuevo and at Ejido Puerto Peñasco, but cattle typically stay close to feed and water except in seasons with abundant annual growth when cattle range widely in the Pinacate region.

Mining occurred historically throughout much of the U.S. range of the pronghorn, but it is currently not a significant threat to Sonoran pronghorn in the U.S. During recent pronghorn surveys in Mexico, increasing effects from gold mining activities were noted in habitats used by the sub-population located southeast of Highway 8.

As discussed above, CBV activities and required USBP response have resulted in increased human presence in remote areas and widespread habitat degradation. For instance, all the valleys at Cabeza Prieta NWR are now criss-crossed with a network of illegal north-south roads and trails, even though those areas are designated as Wilderness. Segee and Neely (2006) report about 180 miles of illegal routes were created in wilderness areas of CPNWR from 2002 to 2006. Based on preliminary estimates, OPCNM reports there may exist a maximum of 1000 miles of unauthorized vehicle routes within a 12-mile radius of the proposed Ajo-1 towers. These routes were likely created both by CBVs and USBP, and most are likely currently used by USBP. Prior to the completion of the vehicle fences on OPCNM and CPNWR (construction was started on these fences in late 2003 and 2007 and completed 2006 and 2009, respectively), CBVs frequently crossed the border in vehicles and created countless illegal routes, many of which were continuously used both by CBVs and responding USBP agents. Subsequent to the construction of the vehicle fences on OPCNM and CPNWR, CBV vehicular traffic was significantly reduced (there are occasional breaches in the fence; however, this CBV vehicular activity represents a fraction of that prior to the presence of the fences). In OPCNM, NPS notes that CBV vehicle activity has decreased since about 2004 (electronic mail, Tim Tibbitts, OPCNM, 2009). Decreased CBV vehicle traffic in pronghorn habitat as a result of the fences has significantly alleviated the adverse effects of this traffic on pronghorn and their habitat. USBP, however, continues to respond (by vehicle, horseback, foot, and aircraft) to ongoing CBV activity (mostly foot traffic) in these areas. Frequently, this required response necessitates driving off of authorized roads which, when conducted in pronghorn habitat, results in significant degradation of pronghorn habitat and disturbance to pronghorn as discussed above.

Fire

The winter and spring of 2004/2005 were very wet, resulting in some of the highest productivity of cool season annual plants in recent memory. As these annual plants dried out, they created fuel for wildfire. In 2005, Mediterranean grass combined with high densities of the native wooly plantain (*Plantago ovata*) and other species created fuels adequate to carry fire. Military training, such as strafing and bombing in the tactical ranges, as well as fires set by CBVs, provided the ignition sources. Exact numbers are unknown; however, in 2005 roughly 7,500 acres of pronghorn habitat burned on the CPNWR (personal communication with Curtis

McCasland, CPNWR, February 15, 2006) and more than 63,000 acres burned on the BMGR-East during that time. Approximately 29,260 acres of pronghorn habitat were consumed as a result of these fires.

Most Sonoran Desert trees, shrubs, and cacti are poorly adapted to fire (Brown and Minnich 1986, Schwalbe *et al.* 2000, Alford and Brock 2002). If areas burn repeatedly, permanent changes are likely in the flora. Even in the best scenario it is likely to be many years before trees once again provide thermal cover in wash communities and cholla recover to a point that they are

useful forage plants for pronghorn. In 2007, 2008, and 2009, pronghorn were attracted to the burned areas, which often supported better growth of annual plants and forbs than adjacent unburned areas. However, in the long term and if these areas continue to burn, removal of thermal cover (trees) and chain fruit cholla, which they depend on in drought, would likely adversely affect pronghorn and probably limit the use of these areas to wetter and cooler periods and seasons.

Drought and Climate Change

As discussed, drought may be a major factor in the survival of adults and fawns (Bright and Hervert 2005), and the major decline in 2002 was driven by drought. Mean annual temperatures rose 1.8-3.6 ^{0}F in the American Southwest from 1970-2004, that trend is accelerating, and is predicted to continue through the 21st century and beyond (Intergovernmental Panel on Climate Change 2007). Most of the observed increases in globally averaged temperatures since the mid-20th century are very likely due to the observed increases in anthropogenic greenhouse gas concentrations (Intergovernmental Panel on Climate Change 2007). In the Sonoran Desert, anthropogenic climate change is causing warming trends in winter and spring, decreased frequency of freezing temperatures, lengthening of the freeze-free season, and increased minimum temperatures in winter, which will likely cause changes in vegetation communities (Weiss and Overpeck 2005). These increases in temperature are predicted to be accompanied by a more arid climate in the Southwest (Seager *et al.* 2007, Intergovernmental Panel on Climate Change 2007). As a result, the Sonoran pronghorn is expected to be confronted with more frequent drought, which increases the importance of recovery actions, such as forage enhancement plots and water developments, which can offset the effects of drought.

Small Population Size and Random Changes in Demographics

At populations of less than 100, population viability declines at an increasingly steep rate. To maintain genetic diversity over the long term, a population of at least 500 is desirable (Defenders of Wildlife 1998). At an estimated 21 in 2002, and 68 in 2008, the U.S. sub-population is critically endangered and has likely experienced a substantial loss of genetic diversity resulting from the 2002 bottleneck; this should gradually improve as more pen-raised animals are released into the wild sub-population. At an estimated 25 in 2002 and 50 in 2007, the Pinacate sub-population is also well below desired numbers. At 354 (in 2007), the third sub-population (southeast of Highway 8) is closer to, but still below the desired size to maintain genetic diversity. Loss of the U.S. sub-population would dramatically reduce our ability to manage or recover this subspecies. Populations at low levels may experience random variations in sex ratios, age distributions, and birth and death rates among individuals, which can cause fluctuations in population size and possibly extinction (Richter-Dyn and Goel 1972). In very sparse populations, males may have trouble finding females, reducing productivity (Ehrlich and Roughgarden 1987). Small populations are also sensitive to variations in natural processes, such as drought and predation (Hecht and Nickerson 1999).

Disease

Sonoran pronghorn can potentially be infected by a variety of viral and bacterial diseases, as well as parasites. Epizootic hemorrhagic disease and Bluetongue virus are the most common cause of disease caused die-off in wild pronghorn (Brown and Ockenfels 2007). Blood testing has shown pronghorn exposure to these diseases by increases in antibody titers over time. The diseases

relevant to pronghorn can be transmitted indirectly through vectors, such as infected midges or ticks, or directly via aerosolized or direct contact of infected fluids or tissues. Diseases that potentially infect pronghorn are all serious diseases of cattle, which can act as vectors. Cattle within the current range of the pronghorn have not been tested for these diseases.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, state, or private actions in the action area; the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform from which to assess the effects of the action now under consultation.

A. Action Area

The "action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Within the U.S. portion of the Sonoran pronghorn's range, pronghorn interact to form one sub-population in which interbreeding may occur. The U.S. sub-population is effectively separated from sub-populations in the El Pinacate Region and on the Gulf Coast of Sonora by Mexico Highways 2 and 8. Activities that may affect animals in any portion of the U.S. range of the pronghorn may affect the size or structure of the U.S. sub-population, or habitat use within the U.S. range. The action area for this biological opinion is defined as the current range of the pronghorn within the U.S. (Figure 2), plus the area around TCA-AJO-310 and its access road.

Management of the action area is almost entirely by Federal agencies. The BMGR (roughly 1.6 million acres) is managed by Luke Air Force Base and the Marine Corps Air Station (MCAS)-Yuma primarily for military training. OPCNM manages 329,000 acres in the southeastern corner of the action area for scenic, ecological, natural, and cultural values. CPNWR lies along the border west of OPCNM and encompasses 860,000 acres. CPNWR is managed to protect, maintain, and restore the diversity of the Sonoran Desert. Most of the refuge and OPCNM are designated as wilderness. The BLM manages lands near Ajo for recreation, grazing, and other multiple uses in accordance with the Lower Gila Resource Management Plan. OPCNM and CPNWR are critically important for Sonoran pronghorn recovery because of their management for protection of natural resources. Lands on the BMGR are managed primarily for military training, and although important recovery is ongoing on these lands and the Department of Defense has generously contributed to the recovery program both on and off the BMGR, changing military priorities could, in the future, limit the value of the BMGR for Sonoran pronghorn recovery.

B. Terrain, Vegetation Communities, and Climate in the Action Area

The action area is characterized by broad alluvial valleys separated by block-faulted mountains and surface volcanics. The Yuma Desert on the western edge of the BMGR is part of a broad valley that includes the Colorado River. Major drainages and mountain ranges run northwest to

southeast. Major drainages flow mostly northward to the Gila River, although southern portions of OPCNM and the southern slope of the Agua Dulce Mountains drain south to the Río Sonoyta.

Climate is characterized by extreme aridity, mild winters, and hot summers. Approximately 2.7 inches of precipitation fall annually at Yuma, with slightly more than half of this occurring in the winter months (Brown 1982). Annual precipitation increases from west to east across the BMGR; at Aguajita/Quitobaquito, precipitation is 10.5 inches annually. The vegetation community of the western portion of the BMGR has been classified as the lower Colorado River Valley subdivision of Sonoran Desert scrub (Brown 1982). It is the largest and most arid subdivision of Sonoran Desert scrub. The Arizona Upland subdivision of Sonoran Desert scrub is found in the Growler, Puerto Blanco, Ajo and Bates mountains, and surrounding bajadas.

C. Status of the Sonoran Pronghorn in the Action Area

Distribution, Abundance, and Life History
The distribution and abundance of the Sonoran pronghorn in the action area is the same as that described above in the Status of the Species for the U.S. sub-population. Life history, including demographics, chronology of breeding and movements, diet, and other factors were also described above for the U.S. population.

Drought
As discussed in the Status of the Species, climate change in the Southwest and the Sonoran Desert is predicted to result in warming trends and drier conditions, with accompanying changes in vegetation communities (Weiss and Overpeck 2005, Seager *et al.* 2007). Rowlands (2000) examined trends in precipitation for southwestern Arizona and OPCNM from 1895-1999. For southwestern Arizona, no trend in precipitation was found for the period, but low precipitation occurred around 1895 and during the 1950s. Periods of high precipitation occurred in 1915-1920 and in the 1980s. For OPCNM, there was a slightly increasing trend in monthly and annual precipitation over the period 1895-1999, a strong drought occurred in the 1950s, and a lesser drought occurred in the 1970s. No discernable trend in precipitation in southwestern Arizona or OPCNM was found in the 1990s, which is when the current decline in the U.S. pronghorn sub-population began.

Since Rowland's analysis, there was one year characterized by above-average rainfall and abundant ephemeral forage (2001) followed by a year with virtually no precipitation or ephemeral forage (2002). Recruitment and survival were high in 2001 and very low in 2002 (Bright and Hervert 2005). Based on the lack of forage and water, and the condition of pronghorn observed, drought is considered the proximate cause of the 79% decline in the U.S. pronghorn sub-population from 2000 to 2002. From 2003 to 2008, rainfall and Sonoran pronghorn range conditions have varied, but have improved overall when compared to 2002. Range conditions in the spring of 2009 were very dry in part and the August 2009 long-term (48-months) drought status report (http://www.azwater.gov/dwr/drought/documents/August2009DroughtStatusUpdate.pdf) indicates that southwestern Arizona is experiencing conditions of abnormally dry to moderate drought.

Historically, pronghorn populations must have weathered severe droughts in the Sonoran Desert, including many that were more severe and longer term than what has occurred recently. Given that pronghorn populations survived the droughts of the 1890s, 1950s, 1970s, and others before those, it is unreasonable to solely attribute recent declines in the U.S. pronghorn population to drought. OPCNM (2001) concluded, "If (individual) recent dry years have had an impact on Sonoran pronghorn, it is most likely because in recent decades Sonoran pronghorn have much more limited options for coping with even brief moderate drought. Because of restrictions on their movements and range, and increasing human presence within their range, pronghorn are less able to employ their nomadic strategy in search of relief. It is not that drought itself is an impact, but possibly that drought has *become* an impact, due to other factors confounding the species' normal ecological strategy."

Recent Recovery Actions

A number of critically important recovery projects have been recently initiated in an attempt to reverse the decline of the U.S. sub-population of the Sonoran pronghorn (Krausman *et al.* 2005b). These projects are designed to increase availability of green forage and water during dry periods and seasons to offset to some extent the effects of drought and barriers that prevent pronghorn from accessing greenbelts and water, such as the Gila River and Río Sonoyta. Many developed and 10 emergency water sources (7 on CPNWR, one on OPCNM, and two on BMGR-West) have been constructed in recent years throughout the range of the U.S. sub-population. Four forage enhancement plots, each consisting of a well, pump, pipelines and irrigation lines, have been developed to irrigate the desert and produce forage for pronghorn. One plot is currently being constructed and two additional plots will be installed over the next five years. Plots and waters located in areas with little human activity and better range conditions appear to be more effective (i.e., contribute to fawn and adult survival to a greater degree) than those located in areas of high human activity and poor range condition (i.e., experiencing drought) (personal communication with John Hervert, AGFD, September 16, 2009). Therefore, to ensure success of these measures, it is critical that human activity is avoided or significantly minimized near the plots and waters.

A semi-captive breeding facility at CPNWR was first stocked with pronghorn in 2004 and as of August 2009 contains 74 animals. As described above, this facility will be used to augment the current U.S. sub-population, and potentially to establish a second herd at Kofa NWR. These crucial projects, which we hope will pull the U.S. population back from the brink of extinction, have been cooperative efforts among many agencies and organizations, including FWS, Arizona Game and Fish Department, MCAS-Yuma, Luke Air Force Base, OPCNM, CBP, Arizona Desert Bighorn Sheep Society, Arizona Antelope Foundation, the Yuma Rod and Gun Club, the University of Arizona, the Los Angeles and Phoenix Zoos, and others.

D. Past and Ongoing Non-Federal Actions in the Action Area

The Status of the Species section describes a variety of human activities that have affected the Sonoran pronghorn since initiation of livestock grazing over 300 years ago (Officer 1993). Many non-Federal activities that have affected the pronghorn are historical in nature, and pronghorn have been all but extirpated from private, state, and Tribal lands. However, increased illegal activities have likely had a significant impact on Sonoran pronghorn in the U.S. in recent

times, particularly since the turn of the millennium. See the "*Human-caused Disturbance*" and "*Habitat Disturbance*" portions of the "Threats" section under "Status of the Species" above for further detail.

E. Past and Ongoing Federal Actions in the Action Area

Because of the extent of Federal lands in the action area, with the exception of CBV activities, most activities that currently, or have recently, affected the U.S. sub-population or their habitat are Federal actions. The primary Federal agencies involved in activities in the action area include the MCAS-Yuma, Luke Air Force Base, FWS, BLM, OPCNM, and Border Patrol. In the following discussion, we have categorized Federal actions affecting the pronghorn as: 1) those actions that have not yet undergone section 7 consultation (although in some cases consultation has been completed on components of the Federal activity), and 2) Federal actions that have undergone consultation.

Federal Actions For Which Consultation Has Not Been Completed

1) U.S. Border Patrol Activities in the Tucson Sector, Arizona

We have been in informal consultation with the Tucson Sector Border Patrol regarding development of a biological assessment for several years (consultation number 02-21-99-I-0138). This consultation would encompass all field activities conducted by the Tucson Sector under their program to detect, deter, and apprehend cross-border violators. Activities within the Ajo Station of the Tucson Sector have the greatest potential to adversely affect pronghorn. Adverse effects may result from patrol and drag road activities, off-road operations, aircraft overflights, operation of FOBs, the use and maintenance of sensors, construction of vehicle barriers and fences, and installation, operation, and maintenance of cameras and communication towers. As USBP has been able to successfully gain control of more urban areas, CBV activity has shifted to more remote areas, such as CPNWR and OPCNM. Both activities have resulted in increased human presence in and widespread degradation of Sonoran pronghorn habitat. As discussed above (see the "*Human-caused Disturbance*" and "*Habitat Disturbance*" portions of the "Threats" section under "Status of the Species"), hundreds to thousands of illegal routes have been created and are likely currently used by CBVs and USBP on CPNWR and OPCNM. Also as mentioned previously, there is substantial evidence that pronghorn avoid areas of high CBV traffic and USBP activities on CPNWR and OPCNM. This activity in pronghorn habitat has likely lead to significant disturbances to pronghorn resulting in decreased fitness and death (from reduced availability of important habitat, separation of does and fawns, increased energetic expenditure from fleeing, etc.). However, it is logical to assume the presence of agents in these areas generally reduces the amount of CBV activity which consequently reduces the potential for disturbance to pronghorn from CBVs.

2) Smuggler/Drug Interdiction

We are aware of U.S. Customs, Drug Enforcement Authority, and Arizona Army National Guard smuggler or drug interdiction activities in pronghorn habitat, including vehicle and helicopter activities. However, we have not received information regarding the extent or types of activities they conduct, and no consultation has occurred on these activities.

3) BLM Off-Road Vehicle Use Area

We are aware of an off-road vehicle (ORV) use area located north of Ajo on BLM land, near the CPNWR, and adjacent to suitable pronghorn habitat. The BLM has not authorized the use of this ORV area but plans to in the updated Resource Management Plan (RMP) they are developing for BLM lands in the vicinity. They will request formal section 7 consultation on the updated RMP. To date, BLM has not provided us with information about the extent and type of use of the ORV area or its possible effects to pronghorn.

4) DHS-CBP Hybrid Fence on BMGR and Vehicle Fence on CPNWR

Consultation was completed for the installation of a vehicle barrier (fence) along the U.S.-Mexico border from Avenue C to the western boundary of OPCNM, including the BMGR (see details below), however, subsequent to issuing the biological opinion, the action was changed to include the installation of a section of hybrid-style fence designed to prevent the passage of pedestrians. Because all environmental laws were waived (as permitted by the Real ID Act of 2005) by Secretary of the DHS, CBP never reinitiated consultation with us regarding this change to their proposed action. However, DHS did provide funding to the FWS for the implementation offsetting measures for Sonoran pronghorn. These offsetting measures will contribute to recovery actions for the Sonoran pronghorn.

5) DHS-CBP Vehicle Fence on CPNWR

CBP constructed and maintains a 1.6-mile segment of vehicle fence (known as CV-2a) and associated roads on the CPNWR. Though the project was likely to adversely affect pronghorn, as well as benefit pronghorn by reducing CBV vehicle activity within the pronghorn range, because all environmental laws were waived (as permitted by the Real ID Act of 2005) by Secretary of the DHS, it never underwent formal consultation. We provided CBP with recommendations to avoid, minimize, and offset effects to pronghorn, however, to date, we do not know if they were implemented.

Federal Actions Addressed in Section 7 Consultations

As part of our comprehensive discussion of all past and present actions affecting pronghorn within the action area, we describe below all biological opinions issued to date on actions that may affect the pronghorn.

Several opinions addressed projects with minor effects to the pronghorn (capture and collaring of pronghorn for research purposes, consultation numbers 02-21-83-F-0026 and 02-21-88-F-0006; installation of a water source in the Mohawk Valley for pronghorn, consultation number 02-21-88-F-0081; implementation of the CPNWR Comprehensive Conservation Plan, consultation number 22410-2006-F-0416; change in aircraft type from the F-15A/B to the F-15E on BMGR-East [F-15E Beddown Project], consultation number 02-21-89-F-0008; and the following projects at OPCNM: widening of North Puerto Blanco Road, consultation number 02-21-01-F-0109; improvements to SR 85 roadway and drainages, consultation 02-21-01-F-0546; and

construction of a vehicle barrier, consultation number 02-21-02-F-237). Incidental take was anticipated only for the Beddown Project in the form of harassment as a result of aircraft overflights. This project was later incorporated into the biological opinion on Luke Air Force Base's activities on the BMGR, discussed below. All of these formal consultations can be viewed on our website at http://www.fws.gov/arizonaes/Biological.htm.

Ten biological opinions evaluated major projects with greater effects to pronghorn:

1) U.S. Border Patrol Activities in the Yuma Sector, Wellton Station, Yuma, Arizona

This biological opinion (consultation number 02-21-96-F-0334), issued September 5, 2000, addressed all USBP activities along the United States/Mexico border in Yuma County from the Colorado River to about the area of Pinta Sands at the southern end of the Sierra Pinta Mountains. The Yuma Sector requested reinitiation of consultation, and we delivered a draft biological opinion in 2004; however, we have not received comments from the USBP to date. Currently, USBP activities within the Yuma Sector/Wellton Station include air and ground patrols; drag road preparation and assessment of road maintenance; remote sensor installation and maintenance; pedestrian and vehicle fence and associated road maintenance; apprehensions and rescues; and assistance to other sectors and agencies. Disturbance to pronghorn was anticipated as a result of on-the-ground USBP operations, and direct injury or mortality of pronghorn as a result of collision with USBP vehicles or by low-level helicopter flights abruptly approaching and startling pronghorn, which may result in injury or energetic stress, particularly during drought. Pronghorn may also be adversely affected by noise and visual impacts of helicopter overflights. To reduce adverse effects on pronghorn, the USBP agreed to implement a number of conservation measures, which to date have not been completed. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. We anticipated take in the form of harassment that is likely to injure up to one pronghorn in 10 years. The following reasonable and prudent measures were provided: 1) minimize injury of pronghorn; 2) monitor and study reactions of pronghorn on BMGR to USBP activities; and 3) provide a means to determine the level of incidental take that results from USBP activities. Several conservation recommendations were also provided. We are not aware of any incidental take attributable to Yuma Sector activities.

2) BLM's Lower Gila South Management Area

Three biological opinions address BLM's Lower Gila South Management Area. The Lower Gila South Resource Management Plan-Goldwater Amendment (consultation number 02-21-90-F-0042), proposed specific and general management guidance for non-military activities on the BMGR. The non-jeopardy biological opinion, issued April 25, 1990, was programmatic, requiring BLM to consult when site-specific projects are proposed. No incidental take was anticipated. The Lower Gila South Habitat Management Plan (HMP) (consultation number 02-21-89-F-0213) provided management guidance for both specific and general actions in southwestern Arizona. Four actions were addressed in the HMP, including an exchange of 640 acres near Ajo, rehabilitation work on two catchments, and assessment of livestock removal from pronghorn habitat. Exchange of land out of public ownership may facilitate development or other uses that would preclude use by pronghorn. The non-jeopardy opinion was issued on May

15, 1990. The biological opinion for the Lower Gila South Resource Management Plan and Amendment (consultation number 02-21-85-F-0069) addressed programmatic management of lands in southwestern Arizona, including livestock grazing, wilderness, cultural resources, fire, minerals and energy, recreation, wildlife management, wood cutting, Areas of Critical Environmental Concern, and other land uses. The non-jeopardy biological opinion was issued on March 27, 1998; no incidental take was anticipated. In regard to management on the BMGR, these three opinions have been replaced by the opinion on the BMGR's Integrated Natural Resources Management Plan (INRMP) (see below). The Air Force and MCAS-Yuma have assumed BLM's management responsibilities on the BMGR.

3) BLM grazing allotments in the vicinity of Ajo, Arizona

The original biological opinion (consultation number 02-21-94-F-0192), issued December 3, 1997, addressed effects to pronghorn resulting from issuance of grazing permits on five allotments, four of which were located near Ajo and Why (Cameron, Childs, Coyote Flat, and Why allotments); and the fifth near Sentinel (Sentinel allotment). All but portions of allotments east of Highway 85 were considered to be within the current distribution of the Sonoran pronghorn. Reinitiations resulted in revised biological opinions dated November 16, 2001, September 30, 2002, June 21, 2004, March 3, 2005, and March 8, 2007. Under the current proposed action, the Cameron Allotment is closed, the Sentinel Allotment has been in non-use for several years, the Coyote Flat and Why allotments were combined into one (Coyote Flat Allotment), and the Childs Allotment remains relatively unchanged in terms of management. Effects of livestock grazing activities included reduced forage availability for pronghorn, human disturbance due to livestock management, barriers to movement caused by pasture and allotment fences, and potential for disease transfer from cattle to pronghorn. The March 8, 2007 opinion concluded that the proposed action was not likely to jeopardize the continued existence of the pronghorn. No incidental take was anticipated, and none is known to have occurred.

4) Organ Pipe Cactus National Monument General Management Plan

The original biological opinion (consultation number 02-21-89-F-0078), issued June 26, 1997, addressed implementation of OPCNM's General Management Plan (GMP). This opinion was reinitiated five times, resulting in revised biological opinions dated November 16, 2001, April 7, 2003, March 10 and August 23, 2005, and March 8, 2007. GMP plan elements included: 1) continuing travel and commerce on SR 85 while enhancing resource protection, 2) seeking designation of OPCNM as the Sonoran Desert National Park, 3) establishment of partnerships, 4) increased wilderness and an interagency wilderness and backcountry management plan, 5) changes in trails, facilities, and primitive camping, and 6) implementation of a Cultural Resources Management Plan. Included were a number of conservation measures to minimize impacts to pronghorn, including "Limiting future development to the area north of the North Puerto Blanco Drive and east of the Senita Basin Road/Baker Mine Trail/Dripping Springs Trail . . .". Effects of the action included human disturbance to pronghorn and habitat due to recreation and management activities. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. In the latest versions of the opinion, no incidental take of pronghorn was anticipated. No incidental take is known to have occurred. The original opinion was the subject of a lawsuit (Defenders of Wildlife, *et al*. v. Bruce Babbitt, *et*

al.) and was remanded by the court due to our failure to adequately address the impact of proposed activities on pronghorn.

5) Marine Corps Air Station-Yuma in the Arizona Portion of the Yuma Training Range Complex

The original biological opinion (consultation number 02-21-95-F-0114), was issued on April 17, 1996. That opinion was reinitiated and revised opinions were issued November 16, 2001 and August 6, 2003. These opinions addressed all proposed and authorized actions on the BMGR by MCAS-Yuma, including ongoing and proposed changes to military flights over CPNWR and the BMGR, operation of various training facilities such as landing strips, a rifle range, targets, a parachute drop zone, a transmitter/telemetry system, ground support areas, and Weapons Tactics Instructor courses, conducted twice a year (March-April and October-November) that involve overflights, ground-based activities, and deliverance of ordnance at targets in BMGR-East. Ground-based activities, such as those of troops and vehicles at ground-support areas were determined to adversely affect pronghorn habitat use. In areas where helicopters fly particularly low and create noise and visual stimuli, disturbance of pronghorn was anticipated. Ordnance delivery at North and South TACs could disturb pronghorn, and ordnance, live fire, and shrapnel could potentially strike and kill or injure a pronghorn. MCAS-Yuma proposed measures to reduce the direct and indirect impacts of the proposed action, including measures to reduce or eliminate take of Sonoran pronghorn and to minimize destruction and degradation of habitat. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. In the 2003 version of the BO, no incidental take of pronghorn was anticipated and none is known to have occurred. This opinion was reinitiated on July 20, 2009, to address a change in aircraft type being used for training activities; to date, the new opinion has not been issued.

6) Luke Air Force Base Use of Ground-Surface and Airspace for Military Training on the BMGR

The original biological opinion (consultation number 02-21-96-F-0094), issued August 27, 1997, addressed military use of the airspace above and the ground space on BMGR-East and CPNWR by Luke Air Force Base. Military activities within the area of overlap with the CPNWR were limited to use of airspace and operation of four Air Combat Maneuvering Instrumentation sites. Military activities occurring within BMGR-East included: airspace use, four manned air-to-ground ranges, three tactical air-to-ground target areas, four auxiliary airfields, Stoval Airfield, and explosive ordnance disposal/burn areas. Primary potential effects of the action included habitat loss due to ground-based activities, harassment and possible mortality of pronghorn at target areas, and disturbance of pronghorn due to military overflights. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. This opinion was reinitiated in 2001 and 2003, resulting in revised opinions dated November 16, 2001 and August 6, 2003. In the latest (2003) opinion, no incidental take was anticipated. We are not aware of any take of pronghorn confirmed attributable to Luke Air Force Base use of the ground-surface and airspace on the BMGR. A pronghorn found dead near a target may have been strafed, but it may also have died from other causes (see “Effects of the Proposed Action” in the 2003 opinion for a full discussion of this incident).

During the development of these opinions, Luke Air Force Base made substantial commitments to minimize the effects of their activities on the Sonoran pronghorn, and additionally committed to implementing a variety of recovery projects recommended by the Sonoran Pronghorn Recovery Team.

7) Western Army National Guard Aviation Training Site Expansion Project

The non-jeopardy biological opinion for WAATS (consultation number 02-21-92-F-0227) was issued on September 19, 1997; however, Sonoran pronghorn was not addressed in formal consultation until reinitiations and revised opinions dated November 16, 2001 and August 6, 2003. The purpose of WAATS is to provide a highly specialized environment to train Army National Guard (ARNG) personnel in directed individual aviator qualification training in attack helicopters. The WAATS expansion project included: 1) expansion of the existing Tactical Flight Training Area, which includes establishing four Level III touchdown sites, 2) development of the Master Construction Plan at the Silver Bell Army Heliport, and 3) establishment of a helicopter aerial gunnery range for use by the ARNG on East TAC of the BMGR. All activities that are part of the proposed action occur outside the current range of the pronghorn, with the exception of training at North TAC. Training at North TAC only occurs when East TAC is closed for annual maintenance and EOD clearances (4-6 weeks each year). Effects to pronghorn at North TAC are minimized by monitoring protocols established by Luke Air Force Base. Training at East TAC could preclude recovery of historical habitat if the many other barriers that prevent pronghorn use of East TAC were removed. The November 16, 2001 and August 6, 2003 opinions found that the proposed action was not likely to jeopardize the continued existence of the pronghorn. No incidental take was anticipated and none is known to have occurred as a result of the proposed action. ARNG included the following conservation measures as part of their proposed action: 1) they proposed to study the effects of low-level helicopter flights on a surrogate pronghorn population at Camp Navajo (to date this measure has not been implemented), and 2) they committed to funding up to five percent of emergency recovery actions on the BMGR.

8) BMGR Integrated Natural Resources Management Plan

The non-jeopardy opinion for this action was issued on August 26, 2005. The Military Lands Withdrawal Act (MLWA) of 1999 required that the Secretaries of the Air Force, Navy, and Interior jointly prepare an INRMP for the BMGR, the purpose of which was to provide for the "proper management and protection of the natural and cultural resources of [the range], and for sustainable use by the public of such resources to the extent consistent with the military purposes [of the BMGR]." The proposed action was comprehensive land management, including public use restrictions, authorizations, and permitting on portions of the BMGR regarding camping, vehicle use, shooting, entry into mines, firewood collection and use, rockhounding, and other activities; natural resources monitoring, surveys, and research; habitat restoration; wildlife water developments; development of a wildfire management plan; law enforcement; limitations on the locations of future utility projects and the Yuma Area Service Highway; control of trespass livestock; and designation of special natural/interest areas, while allowing other designations to expire. The proposed action included many land use prescriptions that would improve the

baseline for the pronghorn. No incidental take was anticipated, and none is known to have occurred from the proposed action.

9) CBP and USBP Permanent Vehicle Barrier from Avenue C to OPCNM, Arizona

This biological opinion (consultation number 22410-2006-F-0113), issued September 15, 2006, addressed the CBP - Office of the Border Patrol's installation of a permanent vehicle barrier (as well as access improvements, construction/improvement of border roads, and associated maintenance and patrol activities) along sections of the border from the western end of the OPCNM barrier to Avenue C just east of San Luis, Arizona. Effects to pronghorn included 1) disturbance of a narrow swath of habitat along the border, 2) presence of construction crews and vehicles that may disturb or preclude use of the area by pronghorn, 3) presence of maintenance and patrol vehicles and crews along the barrier access road, and 4) dramatic reduction or elimination of illegal drive-throughs and required law enforcement response, with much reduced route proliferation and habitat damage from off-highway vehicles. Included were a number of conservation measures to minimize and offset impacts to pronghorn, including the contribution of funds to establish pronghorn waters and forage enhancement plots. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. No incidental take of pronghorn was anticipated. As mentioned above, subsequent to issuing the biological opinion, the action was changed to include the installation of a section of hybrid-style fence designed to prevent the passage of pedestrians. Because all environmental laws were waived (as permitted by the Real ID Act of 2005) by Secretary of the DHS, CBP never reinitiated consultation with us regarding this change to their proposed action.

10) CBP and USBP 5.2-Mile Primary Fence near Lukeville, Arizona

This biological opinion (consultation number 22410-2008-F-0011), issued February 11, 2008, addressed the CBP and USBP action to construct and maintain 5.2 miles of primary fence along the U.S.-Mexico border near Lukeville, Arizona. Effects to pronghorn included 1) disturbance of a narrow swath of habitat along the border, 2) disturbance to pronghorn from construction and maintenance activities, 3) disturbance to pronghorn and their habitat from potential redirection of CBV traffic and ensuing USBP response to the west of the fence; and 4) reduction in CBV and USBP activities north of the fence, with reduced habitat impacts and disturbance to pronghorn. Included were a number of conservation measures to minimize and offset impacts to pronghorn, including the contribution of funds to close and restore unauthorized routes within pronghorn habitat in OPCNM. We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. No incidental take of pronghorn was anticipated.

F. Summary of Activities Affecting Sonoran Pronghorn in the Action Area

Historically, livestock grazing, hunting or poaching, and development along the Gila River and Río Sonoyta were all probably important factors in the well-documented Sonoran pronghorn range reduction and apparent population decline that occurred early in the 20th century. Historical accounts and population estimates suggest pronghorn were never abundant in the 20th century, but recently, the estimated size of the wild population in the action area declined from 179 (1992) to 21 (December 2002). Although the proximate cause of the decline during 2002

was drought, human activities limit habitat use options by pronghorn and increase the effects of drought on the sub-population. The U.S. pronghorn sub-population is isolated from other sub-populations in Sonora by a highway and the U.S./Mexico boundary fence, and access to the greenbelts of the Gila River and Río Sonoyta, which likely were important sources of water and forage during drought periods, has been severed. Since 2002, due to improved drought status and implementation of emergency recovery actions, the wild population increased to 68 in 2008. At 68, however, the wild sub-population is still in grave danger of extirpation due to, among other factors, human-caused impacts, drought, loss of genetic diversity, and predation.

Within its remaining range, the pronghorn is subjected to a variety of human activities that disturb the pronghorn and its habitat, including military training, increasing recreational activities, grazing, significant presence of CBV and subsequent required law enforcement activities. OPCNM (2001) identified 165 human activities in the range of the pronghorn, of which 112 were adverse, 27 were beneficial, 26 had both adverse and beneficial effects, and four had unknown effects. OPCNM (2001) concluded that in regard to the pronghorn, "while many projects have negligible impacts on their own, the sheer number of these actions is likely to have major adverse impacts in aggregate." MCAS-Yuma (2001) quantified the extent of the current pronghorn range that is affected by select activities and found the following: recreation covers 69.6 percent of the range, military training on North and South TACs covers 9.8 percent, active air-to-air firing range covers 5.8 percent, proposed EOD five-year clearance areas at North and South TACs and Manned Range 1 cover 1.0 percent, and MCAS-Yuma proposed ground support areas and zones cover 0.29 percent.

CBV traffic and responding USBP enforcement activities occur throughout the range of the pronghorn, and evidence suggests pronghorn are avoiding areas of high CBV and enforcement activities. Historically, pronghorn tended to migrate to the southeastern section of their range (southeastern CPNWR, such as south of El Camino del Diablo, and OPCNM, such as the Valley of the Ajo) during drought and in the summer. Within the last several years, very few pronghorn have been observed south of El Camino del Diablo on CPNWR. This suggests CBV and the interdiction of these illegal activities have resulted in pronghorn avoiding areas south of El Camino del Diablo; these areas are considered important summer habitat for pronghorn and may have long-term management and recovery implications (personal communication with Curtis McCasland, CPNWR, 2007). Additionally, since the establishment of a FOB at Bates Well, located in the middle of an extremely critical and narrow Sonoran pronghorn movement corridor (Bates Pass) on OPCNM, few pronghorn have been documented using the Valley of the Ajo, and no pronghorn have been documented entering the Valley of the Ajo through the Bates pass area. The valleys at CPNWR and OPCNM, which were once nearly pristine wilderness Sonoran Desert, now have many braided, unauthorized routes through them and significant vehicle use by USBP pursuing CBVs. These areas have also been affected by trash and other waste left by CBVs.

Although major obstacles to recovery remain, since 2002, numerous crucial recovery actions have been implemented in the U.S. range of the species, including 10 emergency waters and four forage enhancement plots, with additional waters and forage plots planned. The projects tend to offset the effects of drought and barriers that prevent movement of pronghorn to greenbelts such as the Gila River and Río Sonoyta. A semi-captive breeding facility, built on CPNWR, currently

holds 74 pronghorn. This facility will provide pronghorn to augment the existing sub-population and hopefully to establish a second U.S. sub-population, possibly at Kofa NWR. Additionally, vehicle barriers on the international border on CPNWR and OPCNM are facilitating recovery of pronghorn by drastically reducing the amount of CBV vehicle traffic in pronghorn habitat.

The current range of the pronghorn in the U.S. is almost entirely comprised of lands under Federal jurisdiction; thus authorized activities that currently affect the pronghorn in the action area are almost all Federal actions. However, CBV foot traffic and off-road vehicle activity and required Federal law enforcement response have been and continue to be significant threats to the pronghorn and its habitat. Prior to November 2001, in seven of 12 biological opinions issued by FWS that analyzed impacts to the pronghorn, we anticipated that take would occur. In total, we anticipated take of five pronghorn in the form of direct mortality every 10-15 years, and an undetermined amount of take in the form of harassment. Given the small and declining population of pronghorn in the U.S. at the time the opinions were written, take at the levels anticipated in the biological opinions would constitute a substantial impact to the population.

Changes made in proposed actions and reinitiated biological opinions from 2001 to the present, plus the findings in other recent opinions, reduced the amount or extent of incidental take anticipated to occur from Federal actions. Significantly, action agencies have worked with us to modify proposed actions and to include significant conservation measures that reduce adverse effects to the pronghorn and its habitat. The only current opinion that anticipates incidental take is the Yuma Sector opinion, in which we anticipated take in the form of harassment that is likely to injure up to one pronghorn in 10 years. With the exception of likely capture-related deaths during telemetry studies (which were addressed in 10(a)(1)(A) recovery permits), we are unaware of any confirmed incidental take resulting from the Federal actions described here (although a pronghorn may have been strafed near one of the targets on BMGR-East – see above).

We believe the aggregate effects of limitations or barriers to movement of pronghorn and continuing stressors, including habitat degradation and disturbance within the pronghorn's current range resulting from a myriad of human activities, exacerbated by periodic dry seasons or years, are responsible for the present precarious status of the Sonoran pronghorn in the action area. However, collaborative, multi-agency and multi-party efforts to develop forage enhancement plots and emergency waters, reduce human disturbance of pronghorn and their habitat, combined with the success of the semi-captive breeding facility, plus planned future recovery actions, including establishment of a second U.S. sub-population, provide hope that recovery of the Sonoran pronghorn in the U.S. is achievable. Key to achieving recovery will be a drastic reduction in human disturbance to pronghorn and their habitat caused by CBV and corresponding enforcement activities.

EFFECTS OF THE ACTION

The Sonoran pronghorn is expected to be affected both directly and indirectly by the proposed action. Short and long-term, direct adverse effects include 1) disturbance of Sonoran pronghorn from noise and lights associated with tower, road, and FOB construction, operation, and maintenance; 2) loss of foraging habitat from tower and road construction; and 3) increased risk

of collision with project construction and maintenance vehicles. Long-term, indirect adverse effects to Sonoran pronghorn may include 1) continued degradation of habitat from USBP operations; and 2) disturbance of pronghorn from USBP operations, potential shifts in CBV traffic to important pronghorn areas, better access for the public provided by new or improved roads, and the presence of towers in Sonoran pronghorn habitat. The proposed action may have a long-term beneficial effect on Sonoran pronghorn if it results in greater effective control of the border leading to eventual decreased CBV and USBP activity in the project area. Implementation of BMPs and offsetting measures will help minimize and offset adverse effects to Sonoran pronghorn resulting from the project.

Disturbance to Sonoran pronghorn and degradation of their habitat as a result of the project will primarily occur within OPCNM, BLM, and CPNWR, all of which are key areas to the survival and recovery of the U.S. population of pronghorn. CPNWR contains essential Sonoran pronghorn areas including fawning habitat, forage enhancement plots, and pronghorn water sites, as well as a semi-captive breeding pen in Child's Valley. OPCNM is also an essential area for pronghorn, particularly during the fawning period and annual spring warming-drying trend (i.e., pronghorn use OPCNM under conditions of greatest thermal and hydration stress). BLM lands to the north of OPCNM and east of CPNWR are also important to Sonoran pronghorn and include water sites. Additionally, a Sonoran pronghorn forage enhancement plot is proposed on BLM lands.

As described in the "Status of the Species", Sonoran pronghorn are sensitive to human disturbance. Vehicle traffic is disturbing to pronghorn and will often cause flight or startle responses with associated adverse physiological changes. Hughes and Smith (1990) found that a Sonoran pronghorn immediately ran 1,310-1,650 feet from a vehicle. Krausman *et al.* (2001) found that Sonoran pronghorn reacted to ground disturbances (vehicles or people on foot) with a change in behavior 37 percent of the time, resulting in the animals running or trotting away 2.6 percent of the time. Wright and deVos (1986) noted that Sonoran pronghorn exhibit "a heightened response to human traffic" as compared to other subspecies of pronghorn. Landon *et al*. (2003) found that, in areas with noise produced by military aircraft, Sonoran pronghorn used the lowest noise level area more than the higher noise level areas. Luz and Smith (1976) documented mild to strong reactions to disturbance cause by helicopter overflights. As another example of disturbance to an ungulate species, bighorn sheep have been documented to abandon their range in response to human disturbance, including human activity and helicopter activities (Jorgenson 1988). Anecdotal evidence suggests that Sonoran pronghorn avoid and may abandon areas of high human activity and that this behavior has led to fawn mortality, as is thought to be the case with pronghorn abandonment of the Granite FEP (see Status of the Species, *Human-caused Disturbance* above). Disturbance and flight of ungulates are known to result in a variety of physiological effects that are adverse, including elevated metabolism, lowered body weight, reduced fetus survival, and withdrawal from suitable habitat (Geist 1971, Harlow *et al.* 1987), which may be exacerbated in harsh environments, such as those occupied by Sonoran pronghorn. Disturbance may also lead to increased risk of predator attack, susceptibility to heat stress and malnutrition, and abandonment of fawns.

Favorable rainfall and forage conditions for pronghorn population growth occurred from 2005-2008, plus nine pronghorn were released from the pen into the wild population, and forage and

water were provided via several artificial water sources and forage enhancement plots. Nonetheless, the population stayed fairly static during this period (2004-58, 2006-68, and 2008-68 pronghorn, Tables 3 and 4). The Sonoran Pronghorn Recovery Team fully expected a significant increase in 2008 over the 2006 numbers, which did not materialize. At 68 animals, this is still a precariously small population. For this population to increase and ultimately recover, other stressors need to be addressed. If drought and human caused disturbance and habitat degradation within the Sonoran pronghorn range in Arizona continue at their current level, Sonoran pronghorn in Arizona may only continue to survive as a result of captive breeding efforts and providing supplemental feed and water for the wild pronghorn population. A significant reduction in disturbance to pronghorn and their habitat is critical to the continued survival and recovery of this species.

Effects from Tower, Road, and FOB Construction, Operation, and Maintenance

Disturbance to Sonoran pronghorn – Direct Effects

Noise, lights, human presence, vehicles, and helicopter operations associated with construction (or improvement/repair), operation, and maintenance of the towers, roads, and the FOB may cause short-term and long-term disturbance to Sonoran pronghorn. Construction of towers TCA-AJO-301 and 310 is not expected to disturb pronghorn, because these towers and their access roads are located outside of pronghorn habitat (TCA-AJO-301 is located at the Lukeville Port of Entry and TCA-AJO-310 is to the east of SR 85). Similarly, construction of tower sites TCA-AJO-189 and 210 is not expected to disturb pronghorn because they are located in steep, rugged terrain outside of immediate pronghorn habitat; however, transport of materials and personnel necessary to construct the towers will require the use of helicopters flying over pronghorn habitat. Currently, a 5-week build cycle with a total of up to 85 lifts will be required to construct tower TCA-AJO-189, and up to 22 lifts will be required to construct tower TCA-AJO-204. These construction-related helicopter operations will likely result in short-term visual and auditory disturbance of pronghorn. However, CBP will significantly minimize this disturbance by following helicopter ingress and egress routes specified by the land managers (these routes avoid frequently used pronghorn habitat) and implementing BMP #28 (pronghorn monitoring and avoidance of project construction activities within 2 miles of pronghorn) and #30 (avoidance of construction during fawning season). Additionally, CBP is currently evaluating alternate lift sites to reduce the length of helicopter flights as well as using a larger helicopter to minimize the number of helicopter lifts required for personnel. CBP will coordinate with land managers and FWS-AESO to reduce helicopter lifts to the absolute minimum number required for construction.

Human and vehicle activity and noise associated with construction of towers deployed by vehicle will likely result in disturbance to Sonoran pronghorn. This disturbance can cause pronghorn to startle and/or flee, travel further distances to find suitable foraging, watering, and resting areas, and result in stress and short-term denial of access to habitat, all of which can result in adverse physiological effects or injury to pronghorn. Fleeing behavior can cause fawns to be abandoned or separated from their mothers, which can leave them vulnerable to predator attack or cause physiological stress that results in death. We anticipate construction of towers TCA-AJO-302 and 003, and roads associated with these towers, will likely have the most significant adverse effects on pronghorn due to their location in important and frequently used Sonoran pronghorn

habitat. Additionally, access to these sites requires driving on roads (i.e., Bates Well Road and North Puerto Blanco Road) that traverse heavily used pronghorn habitat. Construction of towers TCA-AJO-004 and 170 and their associated access roads may adversely affect pronghorn due to their location in important pronghorn habitat. As described in the status of the species, TCA-AJO-004 is located in a narrow Sonoran pronghorn movement corridor leading to the Valley of the Ajo, and tower TCA-AJO-170 is located in Valley of the Ajo (important pronghorn habitat, particularly during the fawning season). Because, however, of the significant amount of human activity associated with the FOB that occurs near these proposed tower sites, Sonoran pronghorn currently seldom use these areas and are therefore less likely to be affected by construction of these towers. Construction of tower TCA-AJO-216 may disturb pronghorn; however, disturbance will likely be very minimal given that pronghorn infrequently use the area due to the high amount of vehicle activity and noise associated with SR 85. Construction of tower TCA-AJO-303 and its associated access roads may also disturb pronghorn, however, because pronghorn infrequently use these areas they are less likely to be disturbed during project construction.

Sonoran pronghorn are particularly susceptible to stress caused by disturbance during the fawning season due to increased energetic demands during this period. Particularly during drought years, due to the low availability of forage and water resources and consequent decreased fitness of adults and fawns, disturbance may result in fawn and adult mortality. Furthermore, as noted above, disturbance during the fawning season may cause fawns to be separated from their mothers which can also result in death. Because some Ajo 1 tower deployment activities (i.e., 1) Site Security, 2) Sensor Payload Installation, 3) SAT Procedure, 4) Communication Acceptance Test Procedure, 5) Site Functional Checkout, 6) Unattended Ground Sensor Testing, 7) Tower Characterization, 8) SAT Dry-runs, 9) SAT Runs for Record, 10) Trouble shooting and Non-conformance work, and 11) Maintenance of Tower sites) will occur during the Sonoran pronghorn fawning season, we anticipate these activities, when compared to the other activities that will occur during the non-fawning season, may adversely affect pronghorn to a greater degree. That said however, in addition to other BMPs, a number of Sonoran pronghorn monitoring and avoidance BMPs, some of which are fawning-season specific, will be implemented to avoid and minimize adverse effects to Sonoran pronghorn to the extent possible during this critical period. These BMPs include #28 (restricts the majority of Ajo 1 construction work to the non-fawning season), #30 (requires Sonoran pronghorn monitoring and avoidance of project construction activities within 2 miles of pronghorn), #31 (requires Sonoran pronghorn monitoring and avoidance of project maintenance activities within 1 mile of pronghorn), #32 (requires additional Sonoran pronghorn monitors at some tower sites during sensor payload installation and tower testing during the fawning season), #33 (requires that fawning season specific monitoring protocols be followed), #34 (requires CBP Sonoran pronghorn monitors to contact AGFD to obtain pronghorn aerial survey data and to follow appropriate protocols depending on the presence of Sonoran pronghorn within two miles of project activities), #35 (requires that both BMP #31 and 30 be followed for maintenance of towers TCA-302 and 003 during the 2010 fawning season), #36 (requires monitors to conduct pronghorn monitoring from sky towers at towers TCA-302 and 003, which will increase the likelihood of detecting pronghorn), and #37 (ensures the Sonoran pronghorn monitor has the authority to delay and stop any project construction and maintenance per protocol). To further avoid and minimize adverse effects to Sonoran pronghorn during the fawning season, CBP has

committed to funding weekly aerial surveys for Sonoran pronghorn throughout the fawning season of 2010 and to develop and operate 5 temporary/emergency food and water plots for Sonoran pronghorn for six months (to be operated during the fawning season 2010). The aerial surveys will be focused near tower sites in pronghorn habitat where Ajo 1 work activities are proposed during the fawning season. The data gathered from the surveys will be used to determine, per BMP # 34, whether Ajo 1 project activities may proceed. The purpose of food and water plots is to lure pronghorn away from tower sites and to buffer adverse effects of disturbance on Sonoran pronghorn by increasing their overall fitness.

Overall, disturbance associated with all phases of construction, including testing, will be short-term (maximum of 80 days) and will be minimized by the implementation of a number of BMPs including those mentioned above, as well as # 24 (requires the minimization of construction and maintenance trips to tower sites), #25 (requires the minimization of the number construction vehicles), and #29 (places restrictions on construction vehicle activity during the fawning season).

Removing the FOB at Bates Well and relocating it to near tower TCA-AJO-302 will likely result in disturbance to Sonoran pronghorn due to human and vehicular activity and noise at the sites and the access roads. Disturbance associated with the relocation will, however, be short-term (maximum of two weeks), and the effects of the disturbance will be minimized by moving the FOB outside the Sonoran pronghorn fawning season (March 15 to July 31). In the longer term, removing the FOB from Bates Well will significantly benefit the Sonoran pronghorn. The FOB is currently located in the middle of an extremely critical and narrow Sonoran pronghorn movement corridor, and the human activity (including lights, noise, vehicle use, etc.) associated with it likely limits or creates a barrier to movement of pronghorn from CPNWR, BLM lands, or the northwestern portion of OPCNM into the Valley of the Ajo on OPCNM. Prior to the establishment of the FOB, Sonoran pronghorn used the Valley of the Ajo extensively during the fawning period (they primarily entered the Valley through the Bates pass area). Subsequent to the establishment of the FOB, no pronghorn have been documented entering the Valley of the Ajo through the Bates pass area. DOI recommended to CBP that they move the FOB from Bates Well to near TCA-AJO-302, which CBP agreed to do to offset effects of their proposed action on pronghorn. When completed, relocation of the FOB (DHS has committed to moving the FOB within one year of completion of this biological opinion) will alleviate adverse effects of the FOB on pronghorn in the Bates Well area and should facilitate the movement of Sonoran pronghorn into the Valley of the Ajo; conversely delays in relocating the FOB will continue to adversely affect pronghorn and pronghorn recovery efforts. Operation of the new FOB near tower TCA-AJO-302 (further addressed below) will adversely affect pronghorn as it will be located in important pronghorn habitat (it was an area of high use prior to 2003); however, in comparison to the current location of the FOB, impacts to pronghorn will be reduced. About one acre will be occupied by the new FOB site within the range of the pronghorn; however, it is not currently vegetated (see analysis below regarding the effects of habitat loss/degradation on pronghorn). From a pronghorn perspective; however, the area of effect of the FOB will be larger than the physical footprint, as pronghorn will likely avoid areas near the FOB due to high levels of human activity and noise.

Maintenance and operation of towers, roads, and the FOB, are anticipated to result in similar effects to Sonoran pronghorn as construction; however, operation and maintenance related disturbance will be long-term and intermittent. As with construction, maintenance and operation of towers TCA-AJO-301 and 310 and their access roads are not expected to disturb pronghorn because these towers are located outside of currently occupied pronghorn range. Similarly, operation of towers TCA-AJO-189 and 204 is not expected to disturb pronghorn; however, maintenance of these towers may result in disturbance to pronghorn as it will require annual helicopter use. Tower TCA-AJO-189 will require four maintenance trips annually. Access to tower TCA-AJO-204 for maintenance will generally be done on foot via a foot trail located outside of pronghorn habitat; however, because personnel may not be able to carry some equipment necessary for routine maintenance, an occasional helicopter lift may be required for maintenance. Additionally, helicopter lifts will be required at proposed tower site TCA-AJO-204 for battery replacements; however, at this time the frequency of battery replacement is unknown and will depend on tower power requirements and weather conditions. As with construction, disturbance to pronghorn from maintenance related helicopter operations will be minimized by following specific ingress and egress routes and by implementing BMPs, including # 24 (minimization of construction and maintenance trips to tower sites) and #38 and #39 (minimization of noise exposure). Furthermore, CBP will coordinate helicopter lifts for maintenance with the land managers and to the extent possible, conduct maintenance of TCA-AJO-189 at the same time maintenance is conducted on an existing repeater in order to reduce the total number of flights to the site.

Vehicles and human activity associated with maintenance of towers, FOB, and associated access roads are anticipated to result in significant disturbance to pronghorn. About 36 visits per tower via vehicle (one vehicle trip to and from each of the proposed tower sites) will be required annually to maintain and refuel towers TCA-AJO-004, 302, 003, all of which are located in important pronghorn habitat. About 14 trips will be required annually to maintain and refuel towers TCA-AJO-170 and 216, and 12 will be required for TCA-AJO-303. Additionally, road and corridor maintenance activities are expected to occur up to six times per year or as necessary. To minimize the adverse effects of disturbance to pronghorn associated with road maintenance activities, these activities will be conducted outside the Sonoran pronghorn closure season to the extent practicable. Specific cases (i.e., road impassable) where road or corridor maintenance is required during the Sonoran pronghorn closure season to allow access to a tower site for maintenance will be coordinated with and require approval from the land manager and FWS-AESO. Disturbance to pronghorn from maintenance activities will be minimized by the implementation of a number of BMPs, including # 24 (minimization of construction and maintenance trips to tower sites), #31 (pronghorn monitoring and avoidance of project maintenance activities within 1 mile of pronghorn), #32 and #33 (minimization of noise exposure) and #35 (requires BMPs #30 and 31 to be followed at towers TCA-AJO-302 and 003 during the 2010 fawning season). The implementation of BMP #31 should help ensure that maintenance does not result in pronghorn being startled or fleeing from areas near maintenance activities. However, because pronghorn are difficult to detect, particularly during the day when they are typically bedded down, there is still a chance that pronghorn may occur near these activities and be startled or flee. This risk will be reduced during the 2010 fawning season at towers TCA-AJO-302 and 003 by the implementation of BMP #35.

Noise associated with the generators at the FOB will be continual and long-term, whereas noise associated with the towers will be intermittent and long-term. Noise from the operation of generators at the FOB and towers (excluding TCA-AJO-301 and 310, as they are located outside of pronghorn habitat) is expected to result in some auditory disturbance of pronghorn. This noise disturbance will be less frequent at tower sites connected to commercial power and most frequent at the FOB. Noise associated with the FOB and towers TCA-AJO-302, 004, 003, and 303 will likely have the most significant impact on pronghorn, as these sites will not be connected to commercial power (therefore generators will be operated more frequently or constantly as is the case with the FOB) and are also located in key pronghorn habitat. Once the FOB is relocated to the site of Tower TCA-AJO-302, because human activity will be significantly reduced in the Bates Well corridor areas, we anticipate that pronghorn will begin to again enter the Valley of the Ajo via the Bates movement corridor (if they do not move in on their own, using the funding described in Sonoran pronghorn offsetting measure #7, DOI will move pronghorn back into the area). Therefore, noise associated with tower TCA-AJO-170 will likely result in disturbance to pronghorn; this disturbance, however, will be minimized because the tower will be connected to commercial power. Noise associated with tower TCA-AJO-004 may disturb pronghorn using the Bates Well corridor; however, because noise will be baffled to less than 35 DBA at 492 feet, this noise is not likely to result in such significant disturbance so as to cause pronghorn to completely avoid use of the area. Noise from generators associated with towers TCA-AJO-189 and 204 is not expected to reach habitat used by pronghorn and therefore is not expected to disturb pronghorn. For all sites with generators, noise disturbance will be minimized by the implementation of BMP # 40 that requires that noise associated with the operations of towers and associated infrastructure and FOB be limited to less than 35 dBA at 492 feet.

Lights associated with nighttime tower and FOB operation or maintenance may disturb Sonoran pronghorn. Disturbance associated with the tower lighting will likely be minimal because it will consist of a porch light controlled by a motion detector. Additionally, the light will be shielded to avoid illumination outside the footprint of the tower site, and low sodium bulbs will be used (BMP #s 41 and 42). Lighting at the FOB will likely result in greater disturbance as a portable light generator will be operated during all nighttime hours. However, lighting impacts at the

FOB will be minimized, to the extent that the effectiveness of the light and security is not compromised, by selective placing of the light, pointing it down toward the ground, and shielding it to prevent light from going up into sky, or out laterally beyond the FOB site footprint.

The proposed action will result in eight towers, associated roads, a FOB and other features located within an important portion of the range of the Sonoran pronghorn. Though towers, roads, and the FOB will not likely create a complete barrier to Sonoran pronghorn movement within the project area, their presence may lead to increased travel time and energetic demands if Sonoran pronghorn avoid and move around these features. Increased energetic demands can have significant adverse consequences for Sonoran pronghorn, particularly during the fawning season.

Disturbance – Indirect Effects

The proposed construction, repairs, improvements, and maintenance of roads could result in some indirect effects to Sonoran pronghorn if they lead to better access for the public within their habitat. The total length of new roads would be approximately 1.27 miles for all 10 towers. The longest segment of new road (TCA-AJO-310) is 1.2 miles, which will be east of Highway 85, which, though suitable pronghorn habitat, is outside the area currently occupied by pronghorn. All other new access roads are less than 100 feet in length and provide access from an existing authorized road to a tower site. In addition to new roads, 3.9 linear miles of authorized road segments, and 4.4 linear miles of authorized corridor will be repaired, and 0.22 linear mile of authorized road segments and 1.7 linear miles of authorized corridor will be improved. All the aforementioned roads will be maintained in addition to another 38.2 miles of authorized roads and a corridor.

Though these roads are currently passable by foot and some vehicles, repairs, improvements, and maintenance of roads will lead to improved road conditions that may facilitate use by a greater number of vehicles, resulting in an increase in public traffic; such improvements may also lead to increased driving speeds (of public, CBVs, or USBP). Increased public access and driving speeds in pronghorn habitat could cause disturbance to pronghorn, which is particularly detrimental during the fawning season and periods of drought, and increases the risk of collision with vehicles, as addressed below.

Additionally, towers may be used as perches by raptors that can prey upon Sonoran pronghorn fawns. However, tower use by birds of prey will be minimized by the implementation of BMP #12 that requires the use of structures to discourage roosting and nesting on towers and associated infrastructure.

Habitat Loss and Degradation-Direct Effects

Construction of the towers and roads, as well as road repairs and improvements will result in removal, destruction, and disturbance of approximately 25.3 acres of Sonoran Desert habitat (18.8 acres of permanent impacts and 6.5 acres of temporary impacts). Some of the sites that will be impacted (i.e., TCA-AJO-189 and 204) occur in steep, rugged terrain not used by pronghorn. Tower TCA-AJO-310 and associated roads occur to the east of Highway 85, outside of the area currently occupied by Sonoran pronghorn. However, impacts from other tower and road sites used by pronghorn will decrease the amount of thermal cover and forage available to pronghorn, the effects of which are accentuated in drought situations when less forage is already available. The FOB will have a one acre footprint; however, the site is not currently vegetated. Although the amount of habitat loss is very small within the context of the approximately 2 million acres of potentially suitable habitat available to the U.S. population of Sonoran pronghorn, it is still extremely important that impacts to thermal cover and forage resources are minimized; this will be done by a number of BMPs, including BMP #s 3, 4, 5, 6, and 8.

Habitat Loss and Degradation – Indirect Effects

Non-native plants often thrive in disturbed areas (Tellman 2002); hence, construction activities could encourage the spread and establishment of these plants. Specifically, the 25.3 acres of disturbed ground will be susceptible to colonization by invasive non-native plants such as buffelgrass, Sahara mustard, and *Eruca vesicaria*. Non-native species may outcompete native species, upon which pronghorn rely, and are known to carry fire, which could also impact pronghorn habitat. Many non-native plants carry fire better and often burn hotter than the native plants (Bock and Bock 2002, Esque and Schwalbe 2002) and most Sonoran Desert trees, shrubs, and cacti are very fire intolerant. For example, fires at Saguaro National Park resulted in greater than 20 percent mortality of mature saguaros (Schwalbe *et al.* 2000). The amount of habitat loss due to potential fire cannot be predicted; however, fire could impact a significant amount of pronghorn habitat. The colonization and spread of non-native plants and the risk of fire will, however, be minimized by the implementation of a number of BMPs, including BMP #s 4-8, 10, 55, 60, 62, 65, 75, and 76.

Additionally, we anticipate some unquantifiable amount of Sonoran pronghorn habitat will be affected by altered hydrology and increased erosion by the towers, the FOB, and associated roads. However, erosion and changes to natural hydrology will be minimized by the implementation of various BMPs, including BMP #s 45 - 49 and 52.

Injury or Mortality from Collisions with Construction and Maintenance Vehicles

Vehicles associated with project construction and maintenance can collide with pronghorn causing injury and/or death. Furthermore, repairs, improvements, and maintenance of roads will lead to improved road conditions that may facilitate increased driving speeds of project construction and maintenance personnel, USBP, CBVs, and the public, which could increase risk of collisions with pronghorn. The risk of construction and maintenance vehicle related collisions will be minimized by the implementation of BMP #s 24 (minimization of construction and maintenance trips to tower sites), #25 (minimization of the number of construction vehicle), #26 (25 mph speed limit implementation), #27 (proper road design), #30 (Sonoran pronghorn monitoring and avoidance of project construction activities within 2 miles of pronghorn), and #31 (Sonoran pronghorn monitoring and avoidance of project maintenance activities within 1 mile of pronghorn). Although incidental take of pronghorn is possible due to collision with construction and maintenance vehicles, no Sonoran pronghorn are known to have been struck and killed on any roads in Arizona, and given the level of such construction and maintenance activities, the likelihood of this occurring is relatively low.

Effects from USBP Operations

Disturbance of Sonoran Pronghorn by USBP Operations

USBP patrol and interdiction activities (by vehicle, aircraft, foot, and/or horseback, including dragging operations and activities associated with the FOB) as a part of the project are anticipated to result in significant disturbance to pronghorn. As described above, this disturbance can cause pronghorn to startle and/or flee, travel further distances to find suitable

foraging, watering, and resting areas, and result in stress and short- and long-term denial of access to habitat, all of which can result in adverse physiological effects, injury to, or mortality of pronghorn. Fleeing behavior can cause fawns to be abandoned or separated from their mothers, which can leave them vulnerable to predator attack or cause physiological stress that results in death. Furthermore, disturbance of Sonoran pronghorn near the forage enhancement plots, waters, and pen could significantly reduce the effectiveness of these crucial recovery actions. USBP activities conducted by vehicle and aircraft are expected to cause greater disturbance than those on foot or horseback. Both on and off-road vehicle travel in pronghorn habitat is likely to result in significant disturbance to pronghorn. Off-road vehicle travel is especially problematic because it intrudes into areas that should act as refuges from human disturbance, and creates new routes that then facilitate increased CBV and USBP travel into pronghorn habitat.

Because we cannot predict the actual location, extent, and frequency of CBV and corresponding USBP activities with any accuracy, we cannot fully assess the impacts of these activities on Sonoran pronghorn. We do know, however, that the towers will provide coverage of the AOR and enable USBP to have a clear view of activities within many of the valleys and bajadas which are critical areas for pronghorn survival and recovery. USBP agents responding to information from the towers will pursue and apprehend CBVs, and in the process will continue to result in disturbance to Sonoran pronghorn. CBP has committed to deploying technology and agents to cover the entire AOR. As also discussed below, we anticipate that over time (beginning about one year of all towers becoming operational), the extent and frequency of both CBV activities and USBP response will decrease and that they will occur closer to the border (i.e., decrease in the tolerance to depth of intrusion). Additionally, interdiction along authorized roads should generally increase, and off-road incursions should decrease as compared to current practices. As a consequence, impacts to Sonoran pronghorn from USBP activities will also decrease over time.

USBP activities associated with the current FOB at Bates Well are anticipated to result in significant adverse effects to pronghorn until that FOB is relocated. As described above, (Disturbance to Sonoran pronghorn – Direct Effects) the human activity (including lights, noise, vehicle use, etc.) associated with the FOB limits or creates a barrier to movement of pronghorn from CPNWR, BLM lands, or the northwestern portion of OPCNM into the Valley of the Ajo on OPCNM, an area critical to Sonoran pronghorn fawn and adult survival. Range curtailment caused by the existing FOB has likely resulted in fawn mortality and decreased fitness of adult pronghorn and is anticipated to continue to have these effects as long as it remains at its current location. These effects will be alleviated once it is relocated.

USBP activities associated with the new FOB near tower TCA-AJO-302 will adversely affect pronghorn as it will be located in important pronghorn habitat; however, in comparison to the current location of the FOB, adverse effects to pronghorn will be reduced. Approximately 10 USBP agents will be stationed at the FOB. These agents will likely make multiple trips within the AOR on a daily basis as they respond to information received by the towers. Vehicular and human activity associated with these trips may disturb or harass pronghorn. Generally, because FOBs are located closer to areas to be patrolled daily by USBP agents, daily ingress and egress trips by vehicle into these areas are minimized; this minimizes the potential for disturbance and harassment of pronghorn. However, we anticipate that the relocation of the FOB to near Tower

TCA-AJO-302 will also provide benefits to the pronghorn by enabling USBP to interdict CBVs closer to the border, therefore alleviating effects of human disturbance in areas to the north. Based on information provided to us by CBP, we anticipate CBV traffic and USBP response may be redirected to north of Growler Pass, including potentially in the Childs Valley where the Sonoran pronghorn pen and three forage enhancement plots are located. Initially we expect there may be an increased risk of CBV and USBP entry into this area within the first year after the towers become operational. However, as described in the description of the proposed action, USBP anticipates that the implementation of tower technology will result in an eventual overall reduction of CBV activity throughout the AOR. Therefore, as USBP gains greater effective control of the border (beginning about one year after the towers become operational), we expect the risk of CBV and responding USBP entry into the area north of Growler Pass should decrease. The risk of CBV traffic being redirected to this area, including Childs Valley, will be minimized because CBP has committed to address those shifts by deploying agents, sensors, MSS units, and other technology to supplement tower technology. Similarly, if CBV traffic is shifted west further into CPNWR, CBP would address that shift with technology and patrols. If concerns arise regarding trends in CBV traffic and their effect on resources, such as Sonoran pronghorn, USBP has committed to working with the land managers to collaboratively find solutions to the operational challenges.

The installation and maintenance of remote sensors may result in some disturbance to Sonoran pronghorn, but due to the relatively non-invasive method of installation, we anticipate this disturbance will be relatively minimal, particularly in comparison to disturbance associated with patrol and interdiction activities. Disturbance will be significantly minimized by implementation of USBP Operational BMP #2. Deployment and operation of MSS may also result in disturbance to pronghorn, though the extent will be minimal as the MSS will be deployed and operated on vehicles that traverse existing roads. The remote sensors and MSS will also have indirect effects on pronghorn, in that similar to the towers, they transmit data about the location of CBV activities, which is then acted upon by USBP agents.

Habitat Loss and Degradation from USBP Operations

USBP patrol and interdiction activities associated with the project will likely result in significant degradation of pronghorn habitat. Off-road vehicle travel can lead to the establishment of unauthorized routes, crush and destroy vegetation, and cause soil erosion and changes in surface hydrology (from channelization of water in entrenched vehicle track prisms) that may substantially impact vegetation that provides forage and cover to pronghorn. Off-road travel also destroys cryptobiotic crusts, which are assemblages of algae, lichens, and mosses in the soil surface. These crusts enhance soil stability, produce soil nitrogen, and in some cases increase water retention and infiltration; all of which can benefit vascular plant communities, including those used as forage resources by pronghorn. Soil disturbance can also promote invasion of non-native plants, which can prevent recruitment of native plants and result in fires, both of which may degrade pronghorn habitat. Furthermore, the establishment of unauthorized routes within Sonoran pronghorn habitat facilitates increased vehicle activity (use by both CBVs and responding USBP) that can significantly disturb Sonoran pronghorn as discussed above. USBP off-road foot or horse operations responding to CBVs may also degrade Sonoran pronghorn habitat, but to a much lesser degree than off- road-vehicle activity.

As we cannot predict the actual location, extent, and frequency of CBVs and the consequent USBP response, we cannot quantify the impacts of these operations on Sonoran pronghorn habitat. We do know that all of the valleys in the action area north of the border are now criss-crossed with many recently-created routes. These routes have been created mostly by CBVs and responding USBP vehicles. However, as further discussed below, we do anticipate that over time, the extent and frequency of both CBV activities and required USBP response will decrease and that they will occur closer to the border. As a consequence, impacts to Sonoran pronghorn habitat from USBP off-road activity will also decrease. Furthermore, implementation of USBP Operational BMP #1 (per the MOU, use of lowest impact mode of travel) in association with this proposed action will reduce potential impacts to pronghorn habitat.

The installation and maintenance of remote sensors may impact some Sonoran pronghorn habitat, but due to the relatively non-invasive method of installation, we anticipate this impact will be very small. Habitat disturbance will be minimized by implementation of USBP Operational BMP #2. MSS will be deployed and operated on vehicles that traverse existing roads. As a result, very minimal effects to Sonoran pronghorn habitat are anticipated from those mobile systems. The remote sensors and MSS will also have indirect effects on pronghorn, in that similar to the towers, they transmit data about the location of CBV activities, which is then acted upon by USBP agents. This USBP response may result in habitat degradation.

Injury or Direct Mortality from Collisions with USBP Vehicles

Vehicles associated with USBP operations responding to CBVs can collide with Sonora pronghorn causing injury and/or death. We anticipate the risk of collisions will decrease after approximately one year of the towers being operational due to decreased CBV and USBP activity in the project area as a result of increased effective control of the border (further discussed below). We are unaware of any Sonoran pronghorn being hit by a vehicle on or off roads in Arizona; thus we believe the likelihood of this occurring in any one year is relatively low. However, USBP maintains significant, constant presence in the action area in regard to motor vehicles, and based on observations of vehicles and high levels of off-road incursions, the current level of vehicle use is unprecedented. Given that the life of the project has no definite end point, the likelihood of an USBP vehicle colliding with the pronghorn is reasonably certain, particularly if the pronghorn population grows, consistent with recovery goals.

Long-term Beneficial Effects

As described above, the proposed action is anticipated to have direct and indirect adverse effects to Sonoran pronghorn and their habitat. However, we expect that tower technology will enable USBP to gain better effective control of the border in the project area and that, over time, the amount of CBV activity and subsequent USBP response within the project area will decrease and that they will occur closer to the border (i.e., decrease in the tolerance to depth of intrusion). Additionally, interdiction along authorized roads should generally increase, and off-road incursions should decrease as compared to current practices. As a consequence, impacts to Sonoran pronghorn from USBP activities will also decrease over time. Based on USBP success in other areas and the information provided, we anticipate USBP will begin to gain greater

effective control after approximately one year of the towers being operational. As a consequence, we anticipate impacts to Sonoran pronghorn and their habitat will also begin to diminish after one year and will likely continue to diminish for a number of years until maximum operational control is reached and maintained.

We anticipate increased operational control will result in less CBV activity in the project area, which will consequently lead to a decrease in disturbance to Sonoran pronghorn and their habitat. The effectiveness of tower technology as described in the description of the proposed action (i.e., that three of the steps required to achieve the requisite satisfactory law enforcement conclusion -detection, identification, and classification, will be primarily performed remotely by a person monitoring signals from the technology, etc.) and the eventual decreased CBV activity should also result in a decrease in USBP off-road vehicle activity, dragging operations, and general patrol activities, including those conducted by vehicle, aircraft, horseback, and foot, in the project area. A decrease in these activities will also result in reduced disturbance to Sonoran pronghorn and reduced degradation of their habitat.

Though we predict that CBV and USBP activity will increase within the first year that the towers are operational and then decline and move closer to the border, we will not be able to measure these trends as we will not have the data to verify our predictions. Therefore we will not have the data to fully assess the impacts of the proposed action on Sonoran pronghorn and their habitat..

Effects of DOI's Actions

The effects to Sonoran pronghorn from OPCNM's issuance of a Special Use Permit are the same as previously described for the construction of towers and associated roads for the purpose of constructing the towers on OPCNM (towers TCA-AJO- 003, 170, 204, 302,303, and 310 only) in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above. Additionally, the effects from a one-time deviation from the first part of a conservation measure ("Limiting future development to the area south of the North Puerto Blanco Drive and east of the Senita Basin Road/Baker Mine Trail/Dripping Springs Trail and limiting timing of construction to occur outside the pronghorn fawning period [March 15 to July 15]") included in the

November 16, 2001 OPCNM GMP biological opinion are the same as previously described for the construction of towers TCA-AJO-170, 302, and 003 and associated roads in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above.

The effects to Sonoran pronghorn from CPNWR's issuance of a Special Use Permit are the same as previously described for the construction, maintenance, and access to tower TCA-AJO-189 on CPNWR in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above. The effects to Sonoran pronghorn from BLM's issuance of a ROW grant are the same as previously described for the construction and maintenance tower TCA-AJO-004 and 216 and construction, repair, improvements, and maintenance of access roads associated with these towers on BLM lands in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above.

Effects of Best Management Practices and Offsetting Measures

BMPs incorporated into the project, such as those mentioned above, will significantly help minimize project impacts to Sonoran pronghorn and their habitat. Additionally, a number of BMPs, such as BMP #23 (reduction of infrastructure in Sonoran pronghorn habitat) followed during the planning phase have already significantly minimized potential impacts to Sonoran pronghorn. Presence of a biological monitor during project construction and reporting requirements will help ensure that BMPs are implemented as designed. Because however, many significant adverse effects cannot be avoided or minimized and because Sonoran pronghorn remain critically endangered, it is imperative that adverse effects are offset to the greatest extent possible. Accordingly, DHS has made significant commitments to fund and implement offsetting measures that contribute to efforts identified by the Sonoran Pronghorn Recovery Team to ensure the continued survival of pronghorn. For example, UVR assessment, closure, and restoration will benefit pronghorn by restoring degraded Sonoran pronghorn habitat and by reducing disturbance to pronghorn caused by off-road vehicle (using the UVRs) activity in pronghorn habitat. The implementation of recovery projects, such as the development of a forage enhancement plot and pronghorn waters, will help improve pronghorn fitness, which should help them better withstand the effects of drought and human disturbance. Conducting surveys and monitoring of Sonoran pronghorn and monitoring the effects of human activities on Sonoran pronghorn will enable us to track population status, pronghorn movements, and areas of high pronghorn use so that we may better manage the species; this will include working with agencies, including USBP, to avoid and minimize use of important pronghorn areas determined by surveys and monitoring.

Changes in Pronghorn Status with the Project

Three populations of Sonoran pronghorn exist throughout their range, including two in Mexico and one in Arizona. The two smallest populations occur primarily within federally protected lands (in Sonoran and Arizona). The largest population occurs primarily outside of protected lands in Mexico and consequently, is at greatest risk (i.e., authorities have much less of an ability to control activities that may harm pronghorn outside of federally protected lands). The survival of all three of these populations is critical to the survival of this species. However, because the largest population occurs outside of a protected area, ensuring the survival of the two populations within federally protected areas, including the one in Arizona, is even more imperative.
Of these two populations, the one in Arizona, which comprises 14% of the total number of wild pronghorn, is the only one over which we have management authority. Additionally, critical recovery projects, including the captive breeding pen, forage enhancement plots, and pronghorn waters, are all located in Arizona. Therefore, though the majority (86%) of Sonoran pronghorn occur outside of the U.S. and will not be affected by the proposed action, because of the importance of the U.S. population, it is critical that project impacts are minimized and offset to the greatest degree possible. Accordingly, as part of their proposed action, DHS will implement or fund the implementation of a number of measures that will significantly minimize and offset the impacts of the proposed project and will help to ensure these impacts do not significantly affect the reproduction, numbers, and distribution of Sonoran pronghorn in the wild in Arizona.

As mentioned above, UVR assessment, closure, and restoration will offset impacts to pronghorn by restoring degraded Sonoran pronghorn habitat and by reducing disturbance to pronghorn, including does and fawns, caused by off-road vehicle (using the UVRs) activity in pronghorn habitat; this should help improve pronghorn numbers and reproduction. Development of a forage enhancement plot and pronghorn waters will help improve pronghorn fitness, which should help them better withstand the effects of drought and human disturbance (i.e., improve numbers and reproduction). Relocating the FOB within one year of the date of this biological opinion will reduce disturbance to and range curtailment (i.e., expand distribution) of pronghorn in the Bates Well area, which we anticipate will improve adult survival and fawn recruitment (i.e., improve numbers and reproduction). Even though it will likely be listed as an experimental, non-essential population, establishment of a second population outside of the current distribution of Sonoran pronghorn will contribute to meeting the downlisting criteria (a population size of 300 animals within the current U.S. range and establishing a second, separate population) and will improve the distribution (i.e., two populations in separate geographical ranges in the U.S. in contrast to the one that currently exists), numbers (i.e., a new captive breeding population will be established at the second site using animals from the captive breeding pen at CPNWR; captive bred individuals at the new site will then be released into the wild, thus increasing the overall number of Sonoran pronghorn in the wild); and reproduction (i.e., as mentioned, a new captive breeding population will be established at the new site, which will increase overall reproduction of the species).

Additionally, as USBP gains greater operational control of the international border, we expect to see a decrease in CBV and USBP activity in the project area, which will consequently lead to a decrease in disturbance to Sonoran pronghorn. As mentioned above, we anticipate this will improve adult survival and fawn recruitment (i.e., improve numbers and reproduction). Additionally, as greater operational control is gained, CBV and USBP activity will occur closer to the border, and off-road incursions should decrease as compared to current practices. These will also lead to a decrease in disturbance to Sonoran pronghorn (i.e., improve numbers and reproduction) and may result in pronghorn using additional areas of their range (i.e., increase distribution).

In conclusion, though many aspects of the proposed action will result in significant impacts to Sonoran pronghorn in the U.S., the long-term benefits provided by the development and operation of the towers and DHS's commitment to implement or fund BMPs and offsetting measures will help to ensure these impacts do not significantly affect the reproduction, numbers, and distribution of Sonoran pronghorn and thus not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Most lands within the action area (current range of the pronghorn within Arizona) are managed by Federal agencies; thus, most activities that could potentially affect pronghorn are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. Relatively small parcels of private and State lands occur within the currently occupied range of the pronghorn near Ajo and Why, north of the BMGR from Dateland to Highway 85, and from the Mohawk Mountains to Tacna. State inholdings in the BMGR were acquired by the USAF. Continuing rural and agricultural development, recreation, vehicle use, grazing, and other activities on private and State lands adversely affect pronghorn and their habitat. MCAS-Yuma (2001) reports that 2,884 acres have been converted to agriculture near Sentinel and Tacna. These activities on State and private lands and the effects of these activities are expected to continue into the foreseeable future. Historical habitat and potential recovery areas currently outside of the current range are also expected to be affected by these same activities on lands in and near the action area in the vicinity of Ajo, Why, and Yuma.

Of most significant concern to pronghorn is the high level of CBV activity in the action area. CBV activity and its effects to pronghorn and pronghorn habitat is described under the "*Human-caused Disturbance*" and "*Habitat Disturbance*" portions of the "Threats" section under "Status of the Species" for Sonoran pronghorn. CBV activity has resulted in route proliferation, off-highway vehicle activity, increased human presence in backcountry areas, discarded trash, abandoned vehicles, cutting of firewood, illegal campfires, and increased chance of wildfire. Habitat degradation and disturbance of pronghorn have resulted from these CBV activities. The trend in overall CBV apprehensions and drive-throughs has declined in recent years within the Ajo Station AOR. Within the Ajo 1 project area, however, an increase in these activities was detected from 2008 to 2009, though at least some of the increase is attributable to increased USBP effort, tactical infrastructure, and technology in the area which have improved the ability to detect and apprehend CBVs (personal communication with USBP, December 2, 2009). Despite high levels of CBV activity and required law enforcement response throughout the action area, pronghorn in the U.S. have managed to increase since 2002, although their use of areas subject to high levels of CBV use and law enforcement have likely declined. We expect CBV activities and their effects on pronghorn to continue, though they should be reduced beginning approximately one year after the Ajo 1 towers are operational.

CONCLUSION

After reviewing the current status of the Sonoran pronghorn; the environmental baseline for the action area; the effects of the proposed activities, including 1) DHS's SBI*net* Ajo-1 Tower project and associated USBP operations, 2) OPCNM's one-time deviation from a conservation measure in their GMP biological opinion and issuance of a Special Use Permit for activities specified in the description of the proposed action, 3) CPNWR's issuance of a Special Use Permit for activities specified in the description of the proposed action, and 4) BLM's issuance of a ROW for activities specified in the description of the proposed action; and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the Sonoran pronghorn. No critical habitat has been designated for this species; therefore, none will be affected. Our conclusion is based on the following:

1. BMPs included in the proposed action will help reduce disturbance to Sonoran pronghorn from project-related activities.

2. Offsetting measures included in the proposed action (i.e., funding to restore habitat, develop a forage enhancement plot and waters, establish a second pronghorn herd, relocating the FOB, etc.) will help offset adverse effects to pronghorn that could result from implementation of the project. Thus, the project is not expected to significantly affect the distribution, numbers, and reproduction of Sonoran pronghorn in the wild.

3. Though CBV activity could shift and increase to the north of Growler Pass (i.e., in Child's Valley or west into CPNWR), such activity should be reduced by USBP's deployment of agents, sensors, MSS units, and other technology to supplement tower technology. Consequently, possible adverse effects to pronghorn from possible increased CBV activity should be minimized.

4. Though we anticipate USBP activity associated with the proposed action will result in significant disturbance to pronghorn, beginning approximately one year of the towers being operational we expect to see a decrease in CBV and USBP activity, including USBP off-road incursions, as well as a shift in these activities closer to the border, which will consequently lead to a decrease in disturbance to Sonoran pronghorn. Thus, the project is not expected to significantly affect the distribution, numbers, and reproduction of Sonoran pronghorn in the wild.

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including any conservation measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR 17.3). "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by CBP so that they become binding conditions of any grant or permit issued to the (applicant), as appropriate,

for the exemption in section 7(o)(2) to apply. CBP has a continuing duty to regulate the activity covered by this incidental take statement. If CBP (1) fails to assume and implement the terms and conditions or (2) fails to require any applicant, contractor, or permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the contract, permit, or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, CBP must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR '402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

We anticipate incidental take of Sonoran pronghorn as a result of this proposed action in the form of harassment due to the effects of human disturbance associated with the project and direct mortality or injury as a result of a collision with a USBP vehicle in the project area.

Specifically, incidental take of three Sonoran pronghorn from the time construction is initiated to one year after the towers become operational, and two Sonoran pronghorn every 5 years thereafter, in the form of harassment is anticipated for the following activities:

1. Continued operation of the FOB in its current location, which prevents movement of pronghorn into the Valley of the Ajo, and access to forage resources that are critical for pronghorn, particularly fawn survival and growth.

2. Disturbance of pronghorn due to construction, operation, and maintenance of the towers in the form of vehicles and helicopters, which cause increased energetic stress and curtailment of access to crucial habitat components, such as important foraging areas and water.

3. Disturbance of pronghorn due to USBP operations, particularly off-road vehicle and helicopter activity in important pronghorn areas. During the spring and early summer, fawns are anticipated to be abandoned when does flee from vehicles or helicopters.

4. Increased energetic stress and curtailment of access to crucial habitat components, including forage enhancement plots and waters, are anticipated to result in incidental take of adults and fawns.

Incidental take is also anticipated in the form of direct mortality from the following activity:

USBP vehicle use in the project area that results in collision with, and injury or mortality of, one Sonoran pronghorn over the life of the project.

Although incidental take is possible due to proposed capture and collaring of pronghorn (Sonoran pronghorn offsetting measures 4, 6, 7, and 8), any such take will be authorized by a section 10(a)(1)(A) permit to the agency (USFWS or AGFD) implementing those actions.

We anticipate the above anticipated incidental take will be difficult to detect. However, incidental take of this species will be anticipated by the level and location of CBV and USBP activities in the project area; monitoring and reporting requirements will allow us to assess these activities. In addition, USBP will report to us any mortality of pronghorn due to collisions with vehicles or other activities. Incidental take will have been exceeded, triggering a requirement for reinitiation (50 CFR 402.16[c]) if:

1. More than one pronghorn is killed or injured due to a collision with a USBP vehicle, or

2. Based on reporting and discussions with CBP on status of operations:

    a. In the project area, there is no decrease in numbers or mean distance to the border of USBP off-road vehicle activity (ORVA) occurrences and CBV events (such events could include apprehensions, seizures, assaults, rescues, and casualties associated with CBV activities) beginning one year (September 1, 2011 to August 31, 2012) after the USBP accepts the towers as operational (towers are expected to be accepted as operational by September 2010; therefore, one year after this is September 2011).

    Monitoring of these activities will be required starting immediately after the issuance of this biological opinion to establish current conditions. Because towers are not expected to be accepted by USBP as operational until September of 2010, monitoring conducted from December 2009 through August 31, 2010 (with report due by October 15) will provide nine months of baseline data to which we may compare data gathered after towers become operational.

    Initially, we will compare the December 2009-August 31, 2010 period to ORVA and CBV event data for the September 1, 2010 to August 31, 2011 period (this analysis will be completed by FWS-AESO 13.5 months after towers have been operational). We expect to see increased CBV events and possibly ORVA levels in the September 1, 2010-August 31, 2011 period as compared to the December 2009-August 31, 2010 period. However, after that, yearly totals (ORVA and CBV events from September 1 to August 31) are expected to decline to some stable, but low level, and move closer to the border over time. Or:

    b. There is no declining trend in USBP activities within 0.25 mile of forage enhancement plots, waters, the captive breeding pen, and other important pronghorn use areas (as explained in terms and conditions 2.1 and 2.2, below) beginning one year after the towers become operational, or

    c. Decreases in parts 2.a. and 2.b. are not sustained over time.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measure(s) are necessary and appropriate to minimize take of Sonoran pronghorn:

1. CBP shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring.

2. CBP shall minimize harassment of Sonoran pronghorn resulting from the proposed action.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, CBP must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure #1 for Sonoran pronghorn:

a. In addition to the monitoring and reporting requirements already specified as part of the proposed action, CBP and any representative of CBP or entity working on behalf of CBP shall monitor the project area and other areas that could be affected by the proposed action to ascertain take of individuals of the species and report this to the FWS. The following monitoring and reporting will be accomplished as follows:

1) Off-road vehicle activity reports. Within the Ajo 1 project area, USBP shall record ORVA as follows: 1) the point (coordinates) of departure from an authorized road, point of destination, and point of reentry to an authorized road, 2) the date, 3) time of day, 4) the type of vehicle (ATV, SUV, etc), 5) if air assistance was provided, and 6) outcome. USBP shall provide these data to FWS-AESO and the DOI land managers in an excel spreadsheet. CBP and DOI will work together to develop a template spreadsheet with instructions to ensure data provided to DOI is properly formatted for analysis. The template shall be developed and finalized within 30 days of the date of this biological opinion. For the life of the project, USBP shall provide all coordinates in a consistent format and datum and will indicate which datum was used. FWS-AESO will use these data to analyze whether incidental take has been exceeded as described above. USBP shall provide these data to FWS-AESO and the DOI land management agencies monthly (due on the 10th of each month) upon issuance of the biological opinion and continue for the life of the project. Upon agreement by FWS and CBP, reporting frequency, manner, and dates may be modified.

CBP will work to obtain and implement the technology needed to provide to DOI full GPS tracks of off-road vehicle routes, rather than the point data required above, which will enable DOI to more precisely track and analyze effects to pronghorn and their habitat.

2) Event reports. Within the Ajo 1 project area, USBP shall monitor and report to the DOI land management agencies and FWS-AESO the following information on each CBV event: 1) event type (apprehensions, seizures, assaults, rescues, and casualties associated with CBV activities), 2) location (coordinates) of event, 3) month of event, 4) the number of CBVs associated with the event, 5) if any non-USBP vehicle associated with the event and if available, the number and type of vehicle(s), and 6) if air operations were included as part of the event. USBP shall provide these data to FWS-AESO and the DOI land managers in an excel spreadsheet. CBP and DOI will work together to develop a template spreadsheet with instructions to ensure data provided to DOI is properly formatted for analysis. The template will be developed and finalized within 30 days of the date of this biological opinion. For the life of the project, USBP shall provide all coordinates in a consistent format and datum and will indicate which datum was used. FWS-AESO will use these data to conduct an analysis to determine whether incidental take has been exceeded as described above. USBP shall provide these data monthly (due on the 10th of each month) to FWS-AESO and the DOI land management agencies upon issuance of the biological opinion and continue for the life of the project. Upon agreement by FWS and CBP, reporting frequency, manner, and dates may be modified.

3) The aforementioned data will be recipient restricted and deemed Law Enforcement Sensitive; thus it will not be subject to FOIA or any publication or other release. Any request for further distribution must be approved by USBP headquarters (contact Assistant Chief, Planning Branch, Strategic Planning Programming and Analysis Division, USBP Headquarters).

4) FWS-AESO will analyze the aforementioned data and provide reports to the DOI land management agencies and CBP biannually for the first three years starting immediately after the issuance of this biological opinion.

a) The first report will include data gathered from December 2009 through August 31, 2010 and will be completed by October 15, 2010.

b) The second report will be completed by April 15, 2011 and will report statistics for the September 1, 2010 through March 31, 2011 period, etc.

c) After three years, FWS-AESO will complete the report on an annual basis by October 15 of each year for the previous September 1-August 31 period. Each report, subsequent to the first report, will compare data to previous reports. Upon agreement by FWS and CBP, reporting frequency, manner, and dates may be modified.

5) CBP shall meet with FWS-AESO and DOI land managers in April 2011, October 2012, and then each October thereafter for the life of the project to review the above reports and assess if take has been exceeded. If reporting frequency, manner, and

dates are modified pursuant to parts a. and b. above, then meeting frequency shall be modified as appropriate.

2. The following terms and conditions implement reasonable and prudent measure #2 for Sonoran pronghorn:

a. Sonoran pronghorn waters, forage enhancement plots, and captive breeding pen. No CBP aircraft use, vehicles off of authorized roads, or other CBP activities shall occur within 0.25 mile of Sonoran pronghorn waters, forage enhancement plots, and the captive breeding pen except in emergency, exigent circumstances as defined in the 2006 MOU among DHS, DOI, and DOA (DOI will provide the coordinates of the sites to CBP). If, because of emergency/exigent circumstances, CBP cannot avoid the aforementioned areas, CBP shall report this incursion activity via electronic mail to the land manager and FWS-AESO as soon as the emergency is resolved but no later than 24 hours after the emergency. The electronic mail report will include the following information: a) coordinates and a description of the location where the incursion occurred, b) date and time of the incursion, c) a brief explanation of the incursion, including the number of CBVs and USBP agents involved and their method of travel, and the outcome of their activity, d) if pronghorn were detected (as already required in CBP BMP #6), and e) any other pertinent details. A short form can be developed for reporting this information.

b. Important Sonoran pronghorn use areas. CBP, CPNWR, OPCNM, BLM, and FWS-AESO shall develop and implement a protocol mutually acceptable to CBP and the DOI agencies by which areas of important pronghorn use (depicted on a map with polygons) will be shared; the map will be updated as needed to reflect changes in important pronghorn use areas. The protocol will be finalized by March 1, 2010. Such important pronghorn use areas shall be limited to areas of concentrated pronghorn use during the fawning season (March 15-July 31 of each year). CBP shall avoid aircraft and vehicle use in these polygons, except on authorized roads and in emergency/exigent circumstances defined in the 2006 MOU among DHS, DOI, and DOA. USBP shall report this incursion activity via the off-road vehicle activity report, which will be submitted by fax or electronic mail to the land manager and FWS AESO as soon as the incursion is resolved but no later than 24 hours after the incursion. The fax/electronic mail report will include the following information: a) coordinates of the ORVA and a description of the location where the incursion occurred, b) date and time of the incursion, c) a brief explanation of the reason for incursion, including the number of CBVs and USBP agents involved and their method of travel, and the outcome of their activity, d) if air assistance was provided e) if pronghorn were detected (as already required in CBP BMP #6), f) a notation that the incursion occurred within an important Sonoran pronghorn use area (polygon) and e) any other pertinent details.

If, as of March 15 of a given year, the Sonoran Pronghorn Recovery Team determines that range conditions are good, we will inform CBP that such limitations in the polygons may be delayed or eliminated for that year. In addition, after 5 years from the date of this BO, we will informally review the status of the Sonoran pronghorn and inform CBP as to whether or not implementation of this term and condition needs to continue.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. CBP must immediately provide an explanation of the causes of the taking and review with the FWS-AESO the need for possible modification of the reasonable and prudent measures.

LESSER LONG-NOSED BAT
STATUS OF THE SPECIES

A. Species Description

The lesser long-nosed bat is a medium-sized, leaf-nosed bat. It has a long muzzle and a long tongue, and is capable of hover flight. These features are adaptations for feeding on nectar from the flowers of columnar cacti (e.g., saguaro; cardon [*Pachycereus pringlei*]; and organ pipe cactus and from paniculate agaves (e.g., Palmer's agave [*Agave palmeri*]) (Hoffmeister 1986). The lesser long-nosed bat was listed (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) as endangered in 1988 (U.S. Fish and Wildlife Service 1988). No critical habitat has been designated for this species. A recovery plan was completed in 1997 (U.S. Fish and Wildlife Service 1997). Loss of roost and foraging habitat, as well as direct taking of individual bats during animal control programs, particularly in Mexico, have contributed to the current endangered status of the species. Recovery actions include roost monitoring, protection of roosts and foraging resources, and reducing existing and new threats. The recovery plan states that the species will be considered for delisting when three major maternity roosts and two post-maternity roosts in the U.S., and three maternity roosts in Mexico have remained stable or increased in size for at least five years, following the approval of the recovery plan. A five-year review has been completed and recommends downlisting to threatened (U.S. Fish and Wildlife Service 2007).

B. Distribution and Life History

The lesser long-nosed bat is migratory and found throughout its historical range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. It has been recorded in southern Arizona from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County) and Copper Mountains (Yuma County), southeast to the Peloncillo Mountains (Cochise County), and south to the international boundary.

Within the U.S., habitat types for the lesser long-nosed bat include Sonoran Desert scrub, semi-desert and plains grasslands, and oak and pine-oak woodlands. Farther south, the lesser long-nosed bat occurs at higher elevations. Maternity roosts, suitable day roosts, and concentrations of food plants are all critical resources for the lesser long-nosed bat. All of the factors that make roost sites useable have not yet been identified, but maternity roosts tend to be very warm and poorly ventilated (U.S. Fish and Wildlife Service 1997). Such roosts reduce the energetic requirements of adult females while they are raising their young (Arends *et al*. 1995).

Roosts in Arizona are occupied from late April to September (Cockrum and Petryszyn 1991) and on occasion, as late as November (Sidner 2000); the lesser long-nosed bat has only rarely been recorded outside of this time period in Arizona (U. S. Fish and Wildlife Service 1997, Hoffmeister 1986, Sidner and Houser 1990). In spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in southwestern Arizona. These roosts are typically at low elevations near concentrations of flowering columnar cacti. After the young are weaned these colonies mostly disband in July and August; some females and young move to higher elevations, primarily in the southeastern parts of Arizona near concentrations of blooming paniculate agaves. Adult males typically occupy separate roosts forming bachelor colonies. Males are known mostly from the Chiricahua Mountains and recently the Galiuro Mountains (personal communication with Tim Snow, Arizona Game and Fish Department, 1999) but also occur with adult females and young of the year at maternity sites (U. S. Fish and Wildlife Service 1997). Throughout the night between foraging bouts, both sexes will rest in temporary night roosts (Hoffmeister 1986).

Lesser long-nosed bats appear to be opportunistic foragers and extremely efficient fliers. They are known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to foraging areas have been documented in Arizona at up to 25 miles and in Mexico at 25 miles and 36 miles (one way) (Ober *et al*. 2000; Dalton *et al*. 1994, Ober and Steidl 2004, Lowery *et al*. 2009). Lowery *et al*. 2009 and Steidl (personal communication, 2001) found that typical one-way foraging distance for bats in southeastern Arizona is roughly 6 to 18 miles. A substantial portion of the lesser long-nosed bats at the Pinacate Cave in northwestern Sonora (a maternity colony) fly 25-31 miles each night to foraging areas in OPCNM (U.S. Fish and Wildlife Service 1997). Horner *et al.* (1990) found that lesser long-nosed bats commuted 30-36 miles round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 47 miles each night. Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest known potential roost site (Lowery *et al*. 2009; personal communication with Yar Petryszyn, University of Arizona 1997).

Lesser long-nosed bats, which often forage in flocks, consume nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by a variety of columnar cacti. Nectar of these cacti and agaves is high energy food. Concentrations of some food resources appear to be patchily distributed on the landscape, and the nectar of each plant species used is only seasonally available. Cacti flowers and fruit are available during the spring and early summer; blooming agaves are available primarily from July through October. In Arizona, columnar cacti occur in lower elevational areas of the Sonoran Desert region, and paniculate agaves are found primarily in higher elevation desert scrub areas, semi-desert grasslands and shrublands, and into the oak and pine-oak woodlands (Gentry 1982). Lesser long-nosed bats are important pollinators for agave and cacti, and are important seed dispersers for some cacti.

C. Status and Threats

Recent information indicates that lesser long-nosed bat populations appear to be increasing or stable at most Arizona roost sites identified in the recovery plan (Arizona Game and Fish Department 2005, Tibbitts 2005, Wolf and Dalton 2005, U.S. Fish and Wildlife Service 2007b;

electronic mail from Tim Tibbitts 2009,). Lesser long-nosed bat populations additionally appear to be increasing or stable at other roost sites in Arizona and Mexico not included for monitoring in the recovery plan (Sidner 2005, Arizona Game and Fish Department 2009). Less is known about lesser long-nosed bat numbers and roosts in New Mexico. Though lesser long-nosed bat populations appear to be doing well, many threats to their stability and recovery still exist, including excess harvesting of agaves in Mexico; collection and destruction of cacti in the U.S.; conversion of habitat for agricultural and livestock uses, including the introduction of bufflegrass, a non-native, invasive grass species; wood-cutting; alternative energy development (wind and solar power); CBV activities and required law enforcement activities; drought and climate change; fires; human disturbance at roost sites; and urban development.

Approximately 20 – 25 large lesser long-nosed bat roost sites, including maternity and late-summer roosts, have been documented in Arizona. Of these, 10 – 20 are monitored on an annual basis depending on available resources (U.S. Fish and Wildlife Service 2007b). Monitoring in Arizona in 2004 documented approximately 78,600 lesser long-nosed bats in late-summer roosts and approximately 34,600 in maternity roosts. More recently, in 2008, the numbers were 63,000 at late-summer roosts and 49,700 at maternity roosts (Arizona Game and Fish Department 2009). Ten to 20 lesser long-nosed bat roost sites in Mexico are also monitored annually. Over 100,000 lesser long-nosed bats are found at just one natural cave at the Pinacate Biosphere Reserve, Sonora, Mexico (Cockrum and Petryszyn 1991). The numbers above indicate that although a relatively large number of lesser long-nosed bats exist, the relative number of known large roosts is quite small.

The primary threat to lesser long-nosed bat is roost disturbance or loss. The colonial roosting behavior of this species, where high percentages of the population can congregate at a limited number of roost sites, increases the risk of significant declines or extinction due to impacts at roost sites. Lesser long-nosed bats remain vulnerable because they are so highly aggregated (Nabhan and Fleming 1993). Some of the most significant threats known to lesser long-nosed bat roost sites are impacts resulting from use and occupancy of these roost sites by CBVs. Mines and caves, which provide roosts for lesser long-nosed bats, also provide shade, protection, and sometimes water, for border crossers. The types of impacts that result from illegal border activities include disturbance from human occupancy, lighting fires, direct mortality, accumulation of trash and other harmful materials, alteration of temperature and humidity, destruction of the roost itself, and the inability to carry out conservation and research activities. These effects can lead to harm, harassment, or, ultimately, roost abandonment (U.S. Fish and Wildlife Service 2005). For example, the illegal activity, presumably by CBVs, at the Bluebird maternity roost site, caused bats to abandon the site in 2002, 2003, and 2005. Other reasons for disturbance or loss of bat roosts include the use of caves and mines for recreation; the deliberate destruction, defacing or damage of caves or mines; roost deterioration (including both buildings or mines); short or long-term impacts from fire; and mine closures for safety purposes. The presence of alternate roost sites may be critical when this type of disturbance occurs.

Threats to lesser long-nosed bat forage habitat include excess harvesting of agaves in Mexico; collection and destruction of cacti in the U.S.; conversion of habitat for agricultural and livestock uses; the introduction of bufflegrass and other invasive species that can carry fire in Sonoran Desert scrub; wood-cutting; urban development; fires; and drought and climate change.

The 2005 fires referred to under Sonoran Pronghorn "Status of the Species" affected some lesser long-nosed bat foraging habitat, though the extent is unknown. For example, the Goldwater, Aux, and Sand Tank Fire Complexes on BMGR-East burned through and around isolated patches of saguaros. Rogers (1985) showed that saguaros are not fire-adapted and suffer a high mortality rate as a result of fire. Therefore, fire can significantly affect forage resources for lesser long-nosed bats in the Sonoran desert. Monitoring of saguaro mortality rates should be done to assess the impacts on potential lesser long-nosed bat foraging habitat. Fire suppression activities associated with the 2005 fires could also have affected foraging habitat. For example, slurry drops may have left residue on saguaro flowers, which could have impacted lesser long-nosed bat feeding efficiency or resulted in minor contamination.

Drought (see the "Status of the Species" and "Environmental Baseline" for Sonoran pronghorn for further details regarding drought) may affect lesser long-nosed bat foraging habitat, though the effects of drought on bats are not well understood. The drought in 2004 resulted in near complete flower failure in saguaros throughout the range of lesser long-nosed bats. During that time however, in lieu of saguaro flowers, lesser long-nosed bats foraged heavily on desert agave (*Agave deserti*) flowers, an agave species used less consistently by lesser long-nosed bats (Tibbitts 2006). Similarly, there was a failure of the agave bloom in southeastern Arizona in 2006, probably related to the ongoing drought. As a result, lesser long-nosed bats left some roosts earlier than normal and increased use of hummingbird feeders by lesser long-nosed bats was observed in the Tucson area (personal communication with Scott Richardson, FWS, January 11, 2008). Climate change impacts to the lesser long-nosed bats in this portion of its range likely include loss of forage resources. Of particular concern is the prediction that saguaros, the primary lesser long-nosed bat forage resource in the Sonoran Desert, will decrease or even disappear within the current extent of the Sonoran Desert as climate change progresses (Weiss and Overpeck 2005, p. 2074). Monitoring bats and their forage during drought years is needed to better understand the effects of drought on this species.

The lesser long-nosed bat recovery plan (U.S. Fish and Wildlife Service 1997) identifies the need to protect roost habitats and foraging areas and food plants, such as columnar cacti and agaves. The lesser long-nosed bat recovery plan provides specific discussion and guidance for management and information needs regarding bat roosts and forage resources (U.S. Fish and Wildlife Service 1997). More information regarding the average size of foraging areas around roosts would be helpful to identify the minimum area around roosts that should be protected to maintain adequate forage resources.

We have produced numerous biological opinions on the lesser long-nosed bat since it was listed as endangered in 1988, some of which anticipated incidental take. Incidental take has been in the form or direct mortality and injury, harm, and harassment and has typically been only for a small number of individuals. Because incidental take of individual bats is difficult to detect, incidental take has often been quantified in terms of loss of forage resources, decreases in numbers of bats at roost sites, or increases in proposed action activities.

Examples of more recent biological opinions that anticipated incidental take for lesser long-nosed bats are summarized below. The 2008 biological opinion for implementation of the SBI*net* Tucson West Project, including the installation, operation, and maintenance of communication and sensor towers and other associated infrastructure, included incidental take in the form of 10 bats caused by collisions with towers and wind turbine blade-strike mortality for the life (presumed indefinite) of the proposed action. The 2007 biological opinion for the installation of one 600 kilowatt wind turbine and one 50KW mass megawatts wind machine on Fort Huachuca included incidental take in the form of 10 bats caused by blade-strikes for the life (presumed indefinite) of the proposed action. The 2005 biological opinion for implementation of the Coronado National Forest Land and Resource Management Plan (U.S. Forest Service) included incidental take in the form of harm or harassment. The amount of take for individual bats was not quantified; instead take was to be considered exceeded if simultaneous August counts (at transitory roosts in Arizona, New Mexico, and Sonora) drop below 66,923 lesser long-nosed bats (the lowest number from 2001 – 2004 counts) for a period of two consecutive years as a result of the action. The 2004 biological opinion for the Bureau of Land Management Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management included incidental take in the form of harassment. The amount of incidental take was quantified in terms of loss of foraging resources, rather than loss of individual bats. The 2003 biological opinion for MCAS–Yuma Activities on the BMGR included incidental take in the form of direct mortality or injury (five bats every 10 years). Because take could not be monitored directly, it was to be considered exceeded if nocturnal low-level helicopter flights in certain areas on the BMGR increased significantly or if the numbers of bats in the Agua Dulce or Bluebird Mine roosts decreased significantly and MCAS-Yuma activities were an important cause of the decline. The 2002 biological opinion for Department of the Army Activities at and near Fort Huachuca (Fort), Arizona anticipated incidental take in the form of direct mortality or injury (six bats over the life of the project), harassment (20 bats per year), and harm (10 bats over the life of the project).

The lesser long-nosed bat recovery plan (U.S. Fish and Wildlife Service 1997), listing document (U.S. Fish and Wildlife Service 1988), and the 5-year review summary and evaluation for the lesser long-nosed bat (U.S. Fish and Wildlife Service 2007), all discuss the status of the species, and threats, and are incorporated by reference.

ENVIRONMENTAL BASELINE

A. Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The FWS has determined that the action area for the lesser long-nosed bat includes the areas directly impacted by the installation of towers and roads and an area around the project defined by a circle with a radius of 36 miles (the maximum documented one-way foraging distance of the lesser long-nosed bat) (Figure 2). Lesser long-nosed bats may occur anywhere between these towers during the time of annual occupancy in the area (see below). The action area represents only a small portion of the lesser long-nosed bat's range.

Management of the action area is largely by Federal agencies, as described in the "Action Area" for Sonoran pronghorn. The action area for the lesser long-nosed bat also includes part of the Tohono O'odham Nation (TON) and lands near the border in Sonora.

B. Terrain, Vegetation Communities, and Climate in the Action Area

A description of the region encompassing the action area has been previously provided (see "Environmental Baseline", part B. Terrain, Vegetation Communities, and Climate in the Action Area" for the Sonoran pronghorn).

The project is near the Sonoyta and Puerto Blanco mountains. Suitable day and night roosting potentially occur within the immediate project vicinity; however, these areas have not recently been surveyed for lesser long-nosed bat roosts.

C. Status of the Lesser Long-Nosed Bat in the Action Area

Based on the known foraging distances for lesser long-nosed bats, it is likely that this species forages throughout portions of the OPCNM, CPNWR, TON, BMGR, and BLM lands, where flowers and fruit of saguaro, organ pipe, and agave are available.

Three large maternity roosts, including Bluebird Mine, Copper Mountain Mine, and Pinacate Cave, and one day-roost, Victoria Mine, occur in the action area. Bluebird Mine, located along the eastern border of CPNWR in the Growler Mountains, is about 3.4 miles from the nearest proposed tower site (TCA-AJO-004) and generally supports an estimated 3,000 lesser long-nosed bats at the peak of annual occupancy (U.S. Fish and Wildlife Service 1997). The highest estimate of lesser long-nosed bats using Bluebird Mine from 2001-2009 bats was 4,500. They abandoned the mine however in 2002, 2003, and 2005 due to disturbance from illegal activities. In 2004, the bats returned to the mine after CPNWR staff placed a high steel fence around the mine to prevent disturbance. The bats returned to the mine in 2005, however abandoned the site once again after the fence was damaged, presumably by CBVs. The 2009 count was 2,427 in May.

Copper Mountain Mine, located within the OPCNM, is about 2.7 miles from the nearest proposed tower site (TCA-AJO-170) and supports an average (calculated from 2000 to 2009) of about 28,654 bats at the peak of annual occupancy (the annual indicator of the base colony size is the average of two estimates, one in early June and one in late June) (electronic mail, Tim Tibbitts, OPCNM, July 9, 2009). The highest estimate of lesser long-nosed bats using Copper Mountain Mine from 2000-2009 bats was 38,932 in 2008, with a count of 33,531 in 2009. Though annual occupancy counts have continued, other monitoring and research at the Copper Mountain Mine has been reduced or eliminated because of researcher safety concerns related to border issues. CBVs have typically used the valley adjacent to the roost area. In 2005, trails, trash, and other indicators of CBV activities moved to an area right below the Copper Mountain Mine roost site. The Victoria Mine day roost, also in OPCNM, is located about 2.6 miles from the nearest proposed tower site (TCA-AJO-204). Historical records of this roost indicate use by about 100 bats.

The largest maternity roost in the action area is Pinacate Cave in northern Sonora, Mexico. Approximately 40 miles south of the nearest proposed tower site, this roost is estimated to support about 130,000 bats each year (U.S. Fish and Wildlife Service 1997). In May 2006, approximately 200,000 lesser long-nosed bats were counted at the Pinacate Cave. However, in 2007, a significantly lower number of lesser long-nosed bats (83,000) were observed.

Before they give birth, female bats probably occasionally move between the Bluebird and Copper Mountain roosts, and it has been recommended that these two roosts be censused simultaneously to avoid double-counting bats (U.S. Fish and Wildlife Service 1997). Observations at Copper Mountain and Pinacate Cave indicate that they are occupied from mid-April to early-to-mid-September (U.S. Fish and Wildlife Service 1997), although they reach their peak occupancy in late spring/early summer.

Though OPCNM and CPNWR monitor the Copper Mountain and Bluebird roosts annually to determine the presence, abundance, and disturbance of lesser long-nosed bats, including examining the roost year round for evidence of human entry, the rest of OPCNM and CPNWR has not been well surveyed to determine the number of additional day and night roosts that might exist in natural caves and/or mineshafts. This is due to safety issues and a lack of resources. A small maternity roost or roosts is known to occur in the Agua Dulce Mountains in the southeastern corner of the CPNWR. Surveys in 2008 documented that a small number of lesser long-nosed bats continue to use these roosts (Corbett 2009). Smaller day roosts are known in other mine tunnels, and are also suspected in other mines and natural rock crevices and caves. Short-term night roosts are known in natural caves, under the eaves of buildings, and inside several abandoned buildings associated with past ranching activities. It is likely that there is within- and between-season interchange between these colonies, perhaps even within and between nights (U. S. Fish and Wildlife Service 1997).

Flowers and fruits of saguaro, organ pipe cactus, and cardon provide nearly all of the energy and nutrients obtained by pregnant and lactating females roosting in the Sonoran Desert in the spring and early summer (U.S. Fish and Wildlife Service 1997). Saguaro, which is common and abundant throughout much of the BMGR, CPNWR, and OPCNM; and organ pipe cactus, which is common at OPCNM and localized in the eastern portions of CPNWR and BMGR, and portions of the TON, flower in May and fruit mature in June and July (Benson and Darrow 1982). Lesser long-nosed bats feed on both the nectar and fruits of these cacti. When cacti fruit are scarce or unavailable in late July or early August, agave nectar may be the primary food resource for lesser long-nosed bats in OPCNM, CPNWR, and TON. Agaves typically bolt or flower and provide a nectar resource for foraging bats from about July into October. Desert agave occurs in mountainous areas within the action area. As mentioned above under “Status of the Species”, the introduction of bufflegrass and other invasive species, fires, and drought and climate change may affect some lesser long-nosed bat foraging habitat within the action area, though the extent is unknown.

A number of activities occur in the action area that could affect bats. Because of the extent of Federal lands in the action area, with the exception of 1) CBV activities, 2) non-Federal activities that occur on the TON, and 3) all activities in Mexico, most activities that currently, or have recently, affected the lesser long-nosed bats or their habitat in the Action Area are Federal

actions, many of which have undergone formal consultation. For example, our 1997 biological opinion on the OPCNM General Management Plan, found that the proposed action could result in incidental take of bats from recreation, specifically from unauthorized human disturbance to the Copper Mountain maternity roost. Our 2003 biological and conference opinion for the installation of the international boundary vehicle barrier on the OPCNM did not anticipate incidental take, but found that the project would result in the disturbance of 70 acres of potential lesser long-nosed bat foraging habitat, including the destruction of up to 750 to 1000 saguaro and 80 to 100 organ pipe cacti (about 400 to 600 of these were to be salvaged). Our 2006 biological opinion on the CBP - Office of the Border Patrol's installation of a permanent vehicle barrier (as well as access improvements, construction/improvement of border roads, and associated maintenance and patrol activities) along the border from the western end of the OPCNM barrier to Avenue C just east of San Luis, Arizona, did not anticipate incidental take. It did find, however, that the project would result in the direct disturbance of approximately 207 acres of potential lesser long-nosed bat foraging habitat, including the destruction of up to 50 saguaros and 3 organ pipe cacti. About 200 saguaros in the project corridor were to be avoided or salvaged. Our 2008 biological opinion on the CBP and USBP installation of 5.2 miles of primary (pedestrian) fence (as well as construction of access roads, and all associated maintenance and patrol activities) along the U.S.-Mexico border near Lukeville, did not anticipate incidental take. However, it did find that the project would result in the direct disturbance of approximately 45 acres of potential lesser long-nosed bat foraging habitat, including the removal or salvage of up to 206 saguaros and 295 organ pipe cacti.

Some Federal actions that may affect the lesser long-nosed bat have not undergone consultation. For example, all the activities listed under "*Federal Actions For Which Consultation Has Not Been Completed"* of Section E. "Past and Ongoing Federal Actions in the Action Area" of the "Environmental Baseline" for Sonoran Pronghorn may also affect the lesser long-nosed bat and its habitat.

High levels of CBV activity (see the "*Human-caused Disturbance*" and "*Habitat Disturbance*" portions of the "Threats" section under "Status of the Species" for Sonoran pronghorn for further details about CBV activity) and the associated damage resulting to the landscape from their activities, as well the activities of law enforcement response, is a threat, not just to lesser long-nosed bats but to all wildlife of the region. As stated earlier, much CBV traffic occurs through the Growler Mountains, and Bluebird Mine on CPNWR in the Growlers was vandalized by suspected CBVs in June 2002, which resulted in at least four dead bats and abandonment of the roost. The bats returned to the mine in 2005; however, they abandoned the site once again after the fence was damaged by CBVs. Both OPCNM and CPNWR continue to evaluate the need for and type of additional protective measures that may be needed at Copper Mountain and Bluebird Mine, such as the possible construction of bat-friendly gates at roost entrances to prevent illegal human entry. However, lesser long-nosed bats are sensitive to bat gates and may not use mines or caves equipped with them. Therefore, use of bat gates to protect these roosts may not be a feasible alternative.

We believe the aggregate effects of general habitat degradation, spread of non-native invasive species, fires, roost disturbance, and drought and climate change, though significant, have not reached the point that lesser long-nosed bats are in imminent danger of extinction. Efforts are

ongoing that contribute to the conservation and protection of populations and habitat within the action area.

EFFECTS OF THE ACTION

The lesser long-nosed bat is expected to be affected both directly and indirectly by the proposed action. Long-term, direct adverse effects include 1) disturbance of bats and habitat from noise and lights associated with tower, road, and FOB maintenance and operations; 2) loss of foraging habitat from tower, road, and FOB construction; and 3) increased risk of collisions with tower structures. Long-term, indirect adverse effects to lesser long-nosed bat may include 1) degradation of habitat from USBP operations; and 2) disturbance to bats from USBP operations, potential shifts in CBV traffic to areas near roost sites, better access for the public provided by new or improved roads, and the presence of towers between roosts and foraging habitat. The proposed action may have a long-term beneficial effect on lesser long-nosed bats if it results in greater operational control of the border leading to eventual decreased CBV and USBP activity in the project area. Implementation of BMPs and offsetting measures will help minimize and offset adverse effects to lesser long-nosed bats.

Effects from Tower, Road, and FOB Construction, Operation, and Maintenance

Disturbance to Lesser Long-Nosed Bats – Direct Effects

Because all construction/improvement of roads and the majority of Ajo 1 tower construction will occur from December into March (i.e., outside the season in which lesser long-nosed bats typically occur in the action area), lesser long-nosed bats will not be directly disturbed by these activities (effects to habitat are addressed below). However, some Ajo 1 tower construction activities (i.e., 1) Site Security, 2) Sensor Payload Installation, 3) SAT Procedure, 4) Communication Acceptance Test Procedure, 5) Site Functional Checkout, 6) Unattended Ground Sensor Testing, 7) Tower Characterization, 8) SAT Dry-runs, 9) SAT Runs for Record, 10) Trouble shooting and Non-conformance work, and 11) Maintenance of Tower sites) may occur from May to July (i.e., during the season in which lesser long-nosed bat occur in the area) and therefore have the potential to adversely affect bats. Ground activities associated with above mentioned activities will only occur at tower sites with cameras (TCA-AJO-003, 004, 170, 216, 302, and 310). Because of the distance of these tower sites and their access roads from known roosts (greater than 2.6 miles), we do not anticipate the non-testing activities will affect lesser long-nosed bats at roost sites. Personnel associated with tower testing may walk closer than 2.6 miles from a roost site; however, per BMP # 22, they will not enter any roosts, so we do not anticipate testing will affect lesser long-nosed bats at roost sites. Additionally, because all the aforementioned activities, except testing, will occur during the day, we do not anticipate they will affect foraging lesser long-nosed bats. Testing will occur during both day and night and therefore has the potential to affect foraging lesser long-nosed bats. However, due to the nature of the testing activities (i.e., it will require up to 12 people traveling on-foot for up to three hour periods and will last a total of 28 days), we anticipate the chances of testing personnel encountering and then disturbing foraging lesser long-nosed bats is very low. Should testing personnel encounter foraging bats, we anticipate the impact to bats will be minimal and short-lived (i.e., foraging bats could temporarily be disrupted from foraging along a specific test route).

The FOB will be relocated to a site near TCA-AJO-302, which is about 9.5 miles from the nearest known roost (Bluebird Mine), therefore relocation/construction of the FOB, providing it occurs during the day (per BMPs #41 and 43), will not directly disturb the species (effects to habitat and indirect effects from USBP activities associated with the FOB are addressed below). Noise, lights, and helicopter operations associated with operation and maintenance of the towers, roads, and the FOB will; however, likely cause some, likely minor long-term disturbance to lesser long-nosed bats.

Noise will be associated with vehicles, helicopters, radios or human voices, generators, and other equipment needed to operate and maintain the towers[1], roads, and the FOB. This noise may disturb bats in the roost or affect their behavior entering or leaving the roost, particularly around maternity roosts (U.S. Fish and Wildlife Service 2007b), or while foraging. The threshold for noise disturbance that results in behavioral disturbance or abandonment of the roost is unknown and likely varies significantly based on distance to the roost, volume and frequency of the noise, and the pattern of the noise (continuous, intermittent, occasional, or sporadic). Lesser long-nosed bats, however, are not very sensitive to sounds below frequencies of 10 kiloHertz (kHz) (Howell 1974). Generally, high frequency noises attenuate in shorter distances than lower frequency noises.

Noise associated with the generators at the FOB will be permanent whereas noise associated with the towers will be intermittent (though long-term). Noise from both will attenuate to less than 35 dBA at 492 ft from the generator. Generators for towers that are not connected to the commercial grid will operate twice per day, for two to four hours for each start. Run times will be shorter on sunny days. Generators for systems connected to the power grid will be limited to one hour twice per month for system conditioning and during commercial power interruptions. Generators associated with operation of the FOB will operate 24 hours per day, 7 days per week. Because of the distance of the tower sites and the FOB from known roosts (greater than 2.6 and 9.5 miles respectively), noise from the operation of generators at the towers and the FOB is not expected to reach bat roosts and therefore, will not disturb bats at those roosts. However, survey efforts have not been exhaustive and there are likely sites, unknown to us, where bats may be day or night roosting near proposed tower sites and FOB and they could potentially be adversely affected by noise associated with the towers and FOB.

Forage plants generally occur near or at tower sites, roads, and the FOB; therefore nighttime generator noise could disturb foraging bats that are immediately adjacent to those sites. Nighttime generator noise could also disturb bats traveling from roosts to forage habitat.

Helicopter operations will occur at TCA-AJO-189 and 204. Deployment of these towers will occur when lesser long-nosed bats are outside of the action area; however maintenance of these towers will require annual helicopter use. Tower TCA-AJO-189 will require four maintenance trips annually. Access to tower TCA-AJO-204 for maintenance will generally be done on foot

[1] A total of 11 towers will be built as part of the Ajo 1 project; however, TCA-AJO-305 was addressed in a separate biological opinion and TCA-AJO-301 is not expected to result in impacts to lesser long-nosed bats because it is located at the Lukeville Port-of-Entry, an area already heavily impacted by human activity.

via a foot trail; however, because personnel may not be able to carry some equipment necessary for routine maintenance, an occasional helicopter lift may be required for maintenance. Additionally, helicopter lifts will be required at proposed tower site TCA-AJO-204 for battery replacements; however, at this time the frequency of battery replacement is unknown and will depend on tower power requirements and weather conditions. Helicopter ingress and egress routes are over 2.6 miles from known roosts. Some types of flights are not a disturbance to the bat while they are in roosts (U.S. Fish and Wildlife Service 2007a). Dalton and Dalton (1993) note, however, that the long-term effects of repeated low level flights are unknown. Because of the distance of the above-mentioned tower sites and ingress and egress routes from known roosts (greater than 2.6 miles), noise associated with tower-maintenance helicopter operations is not expected to reach bat roosts and therefore, will not disturb bats at those roosts. As mentioned previously, much of OPCNM and CPNWR have not been well surveyed to determine the number of additional day and night roosts. If unknown roosts occur near tower sites, bats using those roosts could potentially be adversely affected by helicopter noise associated with tower maintenance.

Forage plants are documented near or at the two tower sites that require helicopter operations. Noise associated with helicopter operations, therefore, could disturb foraging bats that are near these tower sites or helicopter ingress and egress routes, if helicopter operations occur after dark However, this is unlikely to occur as BMP #43 (avoidance and minimization of nighttime construction and maintenance) will be implemented.

Noise associated with vehicles, radios or human voices, and other equipment associated with road, tower, and FOB maintenance is not likely to disturb bats at roosts because no roosts are known to occur closer than 2.6 miles from towers, roads, or the FOB. This noise is also not likely to disturb foraging bats as BMP #43 will be implemented.

Lights will be installed for security at the towers and the FOB. Limited information is available on the effects of lights on bat behavior or habitat use. However, Lowery *et al.* (2009) indicate that lesser long-nosed bats may avoid lighted urban areas during movements between roosts and foraging areas and among foraging areas. Information for other animal species indicates that artificial lighting that shines into a habitat area may alter normal behavior patterns (i.e., foraging, vocalizations), and increase the risk of predation (Rich and Longcore 2006). The safe distance between high-intensity light sources and lesser long-nosed bat roost sites is unknown. Disturbances such as noise and light at roosts can result in stress, increased energetic costs, and roost abandonment, all of which can lead to decreased survival and recruitment rates in lesser long-nosed bats. Activities outside the roost but in close proximity that allow noise or light to intrude into the roost may also result in stress to the resident bats. However, because of the distance of the tower sites and FOB from known roosts (greater than 2.6 miles), light associated with tower and FOB operation is not expected to reach and disturb bats at those roosts.

As stated above, forage plants occur near or at tower sites, roads, and the FOB; therefore lights associated with nighttime tower and FOB operation or maintenance could disturb foraging bats. Disturbance, however, is expected to be minimal because, in accordance with BMP #42, the number of lights used will be minimized and they will be selectively placed, pointed down toward the ground, and installed with shields to prevent light from going up into the sky or out

laterally beyond the tower site footprint. Additionally, in accordance with BMP #41, night lighting for project maintenance will be avoided, and if it is unavoidable, DHS will: 1) use special bulbs designed to ensure no increase in ambient light conditions, 2) minimize the number of lights used, 3) place lights on poles pointed down toward the ground, with shields on lights to prevent light from going up into the sky, or out laterally into landscape, and 4) selectively place lights so they are directed away from all native vegetation communities.

Bats may also avoid foraging areas in the vicinity of towers because of the electromagnetic field (EMF) produced by radar equipment. EMFs can also cause increases in bat's surface and deep body temperatures after prolonged exposures. The radars associated with the proposed towers will emit continuously and have a mean power of 110.72 volts/m at 1 m from the radar, 4.43 volts/m at 25 m, 2.01 volts/m at 55 m, and 1.11 volts/m at 100 m. Because bats are particularly susceptible to EMF strengths of 2 volts/m (Nicholls and Racey 2007), it is likely that tower radars may have some adverse effects on bats in the area. Though it is difficult to predict the extent of this effect, at a minimum, we anticipate bats will avoid foraging or flying closer than 55 meters from the towers.

The proposed action will result in 10 towers, associated roads, a FOB, and other features located within an important portion of the range of the lesser long-nosed bat in Arizona. Most of the action area is suitable foraging habitat (although the FOB site is devoid of vegetation), and three major maternity roosts and one day-roost occur within the action area. Though towers, roads, and the FOB will not likely create a complete barrier to lesser long-nosed bats, their presence between roosts and forage habitat may lead to increased flight time and energetic demands if bats avoid and fly around these features. Increased energetic demands can have significant adverse consequences for nectarivorous bats, particularly for pregnant and lactating females (Studier *et al.* 1973, Kurta 1989, Voigt 2003).

Disturbance – Indirect Effects

Construction, repairs, improvements, and maintenance of roads could result in some indirect effects to lesser long-nosed bats if it leads to better access for the public within lesser long-nosed bat habitat. The total length of new roads will be approximately 1.27 miles for all 10 towers. The longest segment of new road (TCA-AJO-310) is 1.2 miles, which will be east of Highway 85. All other new access roads are less than 100 feet in length and provide access from an existing authorized road to a tower site. In addition to new roads, 3.9 linear miles of authorized road segments and 4.4 linear miles of authorized corridor will be repaired, and 0.22 linear mile of authorized road segments and 1.7 linear miles of authorized corridor will be improved. All the aforementioned roads will be maintained in addition to 38.2 miles of authorized roads and a corridor. Increased public access near roost sites could result in humans entering roosts. Although this would be a significant disturbance to the resident bats because no new, improved, or repaired roads are closer than three miles to known lesser long-nosed bat roosts, we anticipate that human disturbance by the public (see below for discussion regarding effects from disturbance by CBVs) at roost sites is unlikely. If any unknown roosts occur in closer proximity to roads, bats at these roosts would be more susceptible to human disturbance associated with improved public access. Additionally, all primary access roads to be maintained are currently

passable by foot and most vehicles, and though maintenance could lead to an increase in driving speeds, it is unlikely it will lead to a significant increase in public accessibility to roosts.

Foraging Habitat Loss and Degradation – Direct Effects

Land clearing associated with construction of towers, roads, and road repairs and improvements will result in the loss of some foraging habitat. Approximately 25.3 acres (this includes 18.8 acres of permanent disturbance and 6.5 acres of temporary disturbance) of Sonoran Desert habitat will be disturbed and eight forage plants will be directly impacted (removed). A total of seven saguaros were documented within the construction footprint at TCA-AJO-170, 303, and 310, and one organ pipe cactus was documented at TCA-AJO-204. Of these, one saguaro less than three feet tall at TCA-AJO-170 will be salvaged and transplanted adjacent to the tower site and the remaining six saguaro and one organ pipe cactus (greater than three feet) will not be salvaged but will be replaced on OPCNM in coordination with the land manager at a ratio of 3:1 (see BMP#20). Because saguaros and organ pipe cacti less than 6 feet tall generally do not flower, the salvaged cactus, once replanted, and replaced cacti (which will be small), will not be available as a forage resource for lesser long-nosed bats until they reach the size at which they flower.

A total of 13 saguaros occur within the 12-foot temporary construction footprint of roads to be repaired. All of these will be flagged and avoided to the extent reasonable during construction. If a columnar cactus is damaged during road construction, repairs, and improvements, the individual cactus will be replaced at a ratio of 3:1 (see BMP #20). Columnar cacti and agaves seedlings that may have been missed during the surveys will likely be destroyed by project activities. The roots and rooting areas of cacti and agave adjacent to the project corridor might also be damaged; this may affect plant vigor and cause increased plant mortality. Additionally, columnar cacti and agave outside the temporary construction footprint could potentially be damaged as a result of rotor wash during helicopter lifts at TCA-AJO-204. The number of cacti and agave potentially damaged is unquantifiable at this time; however, during construction activities the biological monitor will record any damage to columnar cacti and agave and DHS will mitigate for their loss at a 3:1 ratio.

Disturbance to bat foraging habitat and destruction of and damage to lesser long-nosed bat forage plants reduces available food to the lesser long-nosed bat; this can adversely affect bats, especially during drought periods when forage availability is already impaired. It is difficult to evaluate the significance of the loss of foraging habitat; however, the loss associated with construction of the project is small compared to the large amount of potentially suitable foraging habitat available to the lesser long-nosed bat throughout the action area. However, it is still extremely important that effects to forage resources are minimized; this will be done by the implementation of a number of BMPs, including BMP#s 3, 4, 5, 6, 8, and 20.

Foraging Habitat Loss and Degradation – Indirect Effects

Non-native plants often thrive in disturbed areas (Tellman 2002); hence, construction activities could encourage the spread and establishment of these plants. Specifically, the 25.3 acres of disturbed ground will be susceptible to colonization by invasive non-native plants such as

buffelgrass, Sahara mustard, and *Eruca vesicaria*. Non-native species may prevent the recruitment of lesser long-nosed bat forage species and may carry fire that could also impact lesser long-nosed bat forage species. Many non-native plants carry fire better and often burn hotter than the native plants (Bock and Bock 2002, Esque and Schwalbe 2002) and most Sonoran Desert trees, shrubs, and cacti are very fire intolerant. For example, fires at Saguaro National Park resulted in greater than 20 percent mortality of mature saguaros (Schwalbe *et al.* 2000). Fire can reduce the number of forage plants and result in short-term impacts on bats from smoke and heat. More lasting impacts can result if the microclimate of a roost is affected by the impact of the fire (removal of vegetation, burning of supporting timbers, change in air currents, alteration of hydrology, etc.; U.S. Fish and Wildlife Service 2007b). The colonization and spread of non-native plants and the risk of fire will, however, be greatly minimized by the implementation of a number of BMPs, including #s 4-8, 10, 55, 60, 62, 65, 74, and 75.

Additionally, we anticipate some unquantifiable amount of lesser long-nosed bat foraging habitat will be affected by altered hydrology and increased erosion by the towers, the FOB, and associated roads. However, erosion and changes to natural hydrology will be minimized by the implementation of a number of BMPs, including #s 45-49 and 52.

Injury or Direct Mortality from Collisions with Towers or Construction and Maintenance Aircraft – Direct Effects

Mortality or injury of lesser long-nosed bats could also occur due to collisions with towers. Because all towers occur within or near lesser long-nosed bat foraging habitat, all towers have the potential to cause a collision risk for lesser long-nosed bats. The implementation of BMP #s 16, 17, 18, and 19, however, will help minimize to a degree the risk of bat collisions with towers. Bat collision mortality with towers and other infrastructure has been documented. In 1930, five bats (red, hoary, and silver-haired bats) were killed at a lighthouse in Ontario, Canada. Since then, other bat collisions have been documented at television towers, communication towers, buildings, powerlines, and wind turbines (Johnson 2002, Horn *et al.* 2008). Bats that locate their prey via echolocation may have the ability to navigate through barriers such as towers and wind turbines (Johnson 2002). We have hypothesized that the life history of lesser long-nosed bats may render them less capable echolocators than insectivorous bats. As such, we are concerned that individuals may be susceptible to collisions with towers, which will likely be fatal in most cases (U.S. Fish and Wildlife Service 2007c). The frequency of such collisions is unknown. Foraging height and weather can also increase collision risk. Migratory bird collisions with towers during inclement weather have been well-documented (Manville 2000). Similar evidence exists for bat collisions with towers (Johnson 2002) and bats are known to collide with vegetation (e.g., thornscrub) and die during high winds.

Mortality rates from collisions would be very difficult to determine. Though wind turbines are not associated with this project, the National Wind Coordinating Committee (2004) reports an average “wind project” bat fatality rate of 3.4 bats per turbine per year (based on extrapolations of the number of fatalities with the estimates corrected for observer detection, scavenging, and other sampling biases. The National Wind Coordinating Committee (2004) indicates, however, that actual kills are likely far higher than what can be detected via monitoring. The difference is because not all bats will be found, and many will likely be scavenged before investigators have

an opportunity to record them. Collisions with moving turbines are probably more likely than with the stationary towers proposed herein. However, as mentioned, lesser long-nosed bats may be more susceptible to collision than insectivorous bats because of relatively poor echolocation abilities. If we use the 3.4 bats per turbine as a rough upper estimate of the number of lesser long-nosed bats that could be killed per year, per tower, then we estimate no more than 31 lesser-long-nosed bats may be killed per year as a result of collisions with the nine towers where collisions are likely (excluding tower TCA-AJO-301 at the Lukeville point of entry). Regular monitoring for mortality will detect some proportion of bats that collide with the towers; however, many will be scavenged before the monitoring occurs, or otherwise will not be found.

If helicopters associated with maintenance of towers TCA-AJO-189 and 204 are operated at night where bats are foraging, the extreme downdrafts produced during low-level flights could drive lesser long-nosed bats to the ground or into trees or shrubs where they could be injured or more susceptible to predation (U.S. Fish and Wildlife Service 2003). Helicopter operations at tower sites TCA-AJO-189 and 204 at night also pose a risk of helicopter/bat strikes. However, implementation of BMP #43 will reduce the likelihood of this occurring.

Effects from USBP Operations

Foraging Habitat Loss and Degradation

USBP response to CBV activities frequently requires agents to drive off of authorized roads (i.e., to apprehend CBVs or to respond to emergency situations). USBP off-road vehicle operations associated with the project may degrade lesser long-nosed bat foraging habitat. Off-road vehicle activity degrades foraging habitat for this species through the establishment of trails, increased erosion, and the spread of non-native species that can prevent recruitment of native plants and promote catastrophic wildfires (as described above). Off-road vehicle travel can damage the shallow root systems of large columnar cacti, causing loss of vigor or death, and can be assumed to destroy large numbers of seedlings. Furthermore, off-road travel can cause changes in surface hydrology (from channelization of water in entrenched vehicle track prisms), which can adversely affect vegetation, including lesser long-nosed bat forage species. Off-road travel also destroys cryptobiotic crusts, which are assemblages of algae, lichens, and mosses in the soil surface. These crusts enhance soil stability, produce soil nitrogen, and in some cases increase water retention and infiltration; all of which can benefit vascular plant communities that include bat forage plants. USBP off-road foot or horse operations may also degrade foraging habitat, but to a much lesser degree than off-road vehicle activity.

As we cannot predict the actual location, extent, and frequency of CBV activity and responding USBP off-road vehicle operations, we cannot quantify the impacts of these operations on lesser long-nosed bat habitat. We do know that all of the valleys in the action area north of the border are now criss-crossed with many recently-created routes. These routes have been created mostly by smugglers and USBP vehicles. However, as further discussed below, we do anticipate that over time, the extent and frequency of both CBV activities and law enforcement response will decrease and that they will occur closer to the border. As a consequence, impacts to lesser long-nosed bat habitat from USBP off-road activity will also decrease. Furthermore, implementation of USBP Operational BMP #1 (use of lowest impact mode of travel) will minimize impacts to foraging habitat.

Installation and maintenance of remote sensors may impact some lesser long-nosed bat foraging habitat, but this impact will be minimized by implementation of USBP Operational BMP #2. Mobile surveillance systems will be deployed and operated on vehicles that traverse existing roads. As a result, very minimal effects to lesser long-nosed bat habitat are anticipated from those mobile systems.

Injury or Direct Mortality and Disturbance of Foraging Bats

If USBP helicopters are operated at night where bats are foraging, the extreme downdrafts produced during low-level flights could drive lesser long-nosed bats to the ground or into trees or shrubs where they could be injured or more susceptible to predation (U.S. Fish and Wildlife Service 2003). Also, USBP helicopter operations at night pose a risk of helicopter/bat strikes. However, because the Ajo Station currently and over the last few years has had no nighttime flights and because nighttime flights would only occur in an emergency circumstance, we anticipate effects to foraging bats from these operations will be very minimal. Similarly, USBP operations conducted at night by vehicle, foot, and horse may disturb bats while foraging; however, we anticipate these effects will also be very minimal.

Disturbance of Bats in Roosts

USBP operations that are a part of the proposed action are anticipated to have indirect and direct adverse effects to lesser long-nosed bats at roost sites. USBP aircraft operations near roost sites could disturb bats at these roosts. USBP has committed, however, to avoiding flying over roosts to the extent possible during the time of year in which bats are present (USBP Operational BMP#5). USBP operations by vehicle, on foot, and horse may disturb bats at roosts if they occur in or immediately adjacent to roosts (see below for discussion regarding shifts in CBV traffic).

If the project results in redirection of CBV traffic and required pursuant USBP activities near roost sites, then roosting bats are likely to be disturbed or harassed. Remote caves and mines that may be used by bats are attractive to CBVs looking for places to hide, seeking shelter, or hiding contraband. USBP has committed to not entering roost sites, except in emergency or exigent circumstances (BMP #22). However, when USBP must enter these sites to apprehend CBVs, disturbance of the bats (from both CBVs and USBP) can lead to complete roost abandonment, which can be expected to result in decreased survival, reproductive failure, and mortality as was observed in 2002, 2003, and 2005 at Bluebird Mine roost. In cases where human disturbance does not lead to complete roost abandonment, it may still lead to decreased survival of young and adults. In maternity colonies, young bats left alone at night are vulnerable to falling off the ceiling if stressed by human presence. This may also occur if their mothers are disturbed during daytime resting. Even if young bats remain safely on the ceiling, stress from the disturbance event can affect their general health and growth. There may be an energetic cost to bats that are repeatedly disturbed in roosts and leave to find another shelter. Prolonged or frequent human presence can also change temperature and humidity within caves to the detriment of bats.

Based on information provided to us by CBP, we anticipate CBV traffic may be redirected near Bluebird Mine roost (just north of Growler Pass), which could result in an increased risk of CBV and responding USBP entry into the roost. We do not anticipate CBV activity will be as great at the Copper Mountain Roost as at the Bluebird Mine roost. However, because the valley adjacent to the roost site is a known CBV travel route, we anticipate that some impacts to the roost from CBV and consequently required USBP response activity could occur if traffic continues or increases in these areas. There are historical roost locations in the Agua Dulce Mountains on CPNWR, and surveys in 2008 documented that a small number of lesser long-nosed bats continue to use these roosts (Corbett 2009). These roosts may experience increased CBV and responding USBP traffic. We do not anticipate there will be an increased risk of CBV and USBP entry into Victoria Mine as a result of this project. As mentioned previously, if CBV and USBP entry into these roosts occurs during the time in which bats are present, bats are likely to be disturbed, which could result in abandonment and mortality. That said, because we are unaware of any occurrences of USBP entering roosts and causing bats to abandon them, we anticipate the likelihood of this occurring in any one year is relatively low. However, over the life of the project, which has no end point, the likelihood becomes reasonably certain. Should, however, roost entries occur, entry into Copper Mountain and Bluebird Mine would have the greatest impact on lesser long-nosed bats, as these are significant maternity roosts. These impacts could include mortality of a number of young and adults from stress, increased energetic costs, falling, or increased vulnerability to predators or possibly mortality of an entire cohort of young in a maternity roost if mothers abandon the roost before their young are capable of flight. Based on experience at Bluebird Mine, recounted above, if roosts are abandoned due to CBV and responding USBP entries, we expect the bats will return within one year.

Initially we expect there may be a marked increased risk of CBV and potentially USBP entry into roost sites within the first year after the towers become operational. However, as described in the description of the proposed action, USBP anticipates that the implementation of tower technology will result in an eventual overall reduction of CBV activity throughout the AOR. Therefore, as USBP gains greater effective control of the border (beginning about one year after the towers become operational), the risk of CBV and consequent USBP entry into roosts should decrease. Additionally, if concerns arise regarding trends in CBV traffic and their effect on resources, such as bat roosts, USBP has committed to deploy agents, sensors, MSS units, and other technology, as well as work with the land managers, to collaboratively find solutions to the operational challenges. Furthermore, the risk of entry at Bluebird Mine is decreased by security fencing that surrounds the mine entrance. After USBP gains greater effective control of the border, we expect the risk of CBV and USBP entry into it should decrease.

Long-term Beneficial Effects

As described above, the proposed action is anticipated to have direct and indirect adverse effects to lesser long-nosed bat (both at roost sites and foraging habitat). However, we expect that tower technology will enable USBP to gain better operational control of the border in the project area and that, over time, the amount of CBV activity and subsequent USBP response within the project area will decrease and that they will occur closer to the border (i.e., decrease in the tolerance to depth of intrusion). Based on USBP success in other areas and the information provided, we anticipate USBP will begin to gain greater operational control after approximately

one year of the towers being operational. As a consequence, we anticipate impacts to lesser long-nosed bats will also begin to diminish after one year and will likely continue to diminish for a number of years until maximum operational control is reached and maintained.

We anticipate increased operational control will result in less CBV activity in the project area, which will consequently lead to a decreased risk of disturbance to bats at roost sites and a reduction in foraging habitat degradation. We anticipate the effectiveness of tower technology as described in the description of the proposed action (i.e., that three of the steps required to achieve the requisite satisfactory law enforcement conclusion -detection, identification, and classification - will be primarily performed remotely by a person monitoring signals from the technology, etc.) and the eventual decreased CBV activity will also result in a decrease in USBP off-road vehicle activity, dragging operations, and general patrol activities, including those conducted by vehicle, aircraft, horseback, and foot, in the project area. A decrease in these activities will also result in reduction in foraging habitat degradation.

Effects of DOI's Actions

The effects to lesser long-nosed bats from OPCNM's issuance of a Special Use Permit are the same as previously described for the construction of towers and associated roads for the purpose of constructing the towers on OPCNM (towers TCA-AJO- 003, 170, 204, 302,303, and 310 only) in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above.

The effects to lesser long-nosed bats from CPNWR's issuance of a Special Use Permit are the same as previously described for the construction, maintenance, and access to tower TCA-AJO-189 on CPNWR in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above. The effects to lesser long-nosed bats from BLM's issuance of a ROW grant are the same as previously described for the construction and maintenance tower TCA-AJO-004 and 216 and construction, repair, improvements, and maintenance of access roads associated with these towers on BLM lands in the "*Effects from Tower, Road, and FOB Construction, Operation, and Maintenance*" above.

Effects of Best Management Practices and Offsetting Measures

BMPs incorporated into the project, such as those mentioned above, will significantly help minimize project impacts to lesser long-nosed bats and their habitat. Presence of a biological monitor during project construction and reporting requirements will help ensure that BMPs are implemented as designed.

Additionally, DHS' commitment to implement offsetting measures will help provide valuable information to land managers and our office that will enable us to better manage and conserve the species. For example, the study to identify unknown roosts will allow us to implement protective measures at new roosts once they are discovered. Monitoring at tower sites for bat collisions will allow us to assess tower-related mortality of lesser long-nosed bats and if mortality is documented, DHS will work to reduce such mortality. Additionally, though proposed as an offsetting measure for Sonoran pronghorn, UVR assessment, closure, and restoration will also benefit lesser long-nosed bats and their habitat.

Changes in Lesser Long-Nosed Bat Status with the Project

The lesser long-nosed bat ranges from southern Arizona and extreme southwestern New Mexico, south through western Mexico to El Salvador. In Arizona and Mexico, populations of this species appear to be increasing or are stable at many roost sites. Within the Action Area (including the Pinacate roost in Sonora), at least 161,000 lesser long-nosed bat bats seasonally occur, and within the project area (including only roosts in Arizona), at least 31,000 bats are seasonally in residence. Though some portion of lesser long-nosed bats throughout the action area may be affected by the proposed project, the greatest impacts will be to bats occurring in the project area in Arizona. These lesser long-nosed bats represent about 19% of all individuals in the action area, and an even lesser percentage of the overall bat population. Therefore, though many aspects of the proposed action will adversely affect lesser long-nosed bats, in the context of the overall lesser long-nosed bat population and distribution, the proposed action is not likely to significantly reduce the numbers and distribution of lesser long-nosed bats in the wild. However, in the context of known lesser long-nosed bat roosts, the roosts within the action area significantly contribute to the overall viability of lesser long-nosed bat populations. If USBP entry into roosts causes females to abandon their young before they are capable of flight or if pregnant females abandon the roost and cannot find a suitable alternative maternity roost, complete reproductive failure for the year could occur at a roost. However, because we are neither aware of USBP ever entering a roost, nor complete reproductive failure occurring as a result of USBP entry into lesser long-nosed bat roosts, we anticipate the likelihood of both USBP entry and complete reproductive failure occurring is relatively low. If it did occur, reproductive failure for females at one roost in the project area, though significant, would have a reduced effect on lesser long-nosed reproduction range wide. Furthermore, the implementation of BMPs and offsetting measures will help to ensure these impacts do not significantly affect the reproduction, numbers, and distribution of lesser long-nosed bats in the wild.

CUMULATIVE EFFECTS

Many lands within the action area are managed by Federal agencies; thus, most activities that could potentially affect bats are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on the TON, on private lands in the U.S., and in Mexico. Residential and commercial development, farming, livestock grazing, planting of buffelgrass, surface mining and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in loss or degradation of lesser long-nosed bat foraging habitat, and potential disturbance of roosts. CBV activities, described above under “Cumulative Effects” for pronghorn, can result in loss or degradation of potential lesser long-nosed bat foraging habitat (impacts to foraging habitat have not been quantified, however) and disturbance to and abandonment of roosts, as has been documented at the Bluebird Mine roost site. These CBV activities result in creation of trails and routes that can degrade lesser long-nosed bat habitats and disturb individual bats. Persons involved in these illegal activities often build cooking or warming fires, some of which escape and become wildfires. The trend in overall CBV apprehensions and drive-throughs has declined in recent years within the Ajo Station AOR. Within the Ajo 1 project area, however, an increase in these

activities was detected from 2008 to 2009, though at least some of the increase is attributable to increased USBP effort, tactical infrastructure, and technology in the area which have improved USBP's ability to detect and apprehend CBVs (personal communication with USBP, December 2, 2009).

CONCLUSION

After reviewing the current status of the lesser long-nosed bat; the environmental baseline for the action area; the effects of the proposed activities, including 1) DHS's SBI*net* Ajo-1 Tower project and associated USBP operations, 2) OPCNM's one time deviation from a conservation measure in their GMP biological opinion and issuance of a Special Use Permit for activities specified in the description of the proposed action, 3) CPNWR's issuance of a Special Use Permit for activities specified in the description of the proposed action, and 4) BLM's issuance of a ROW for activities specified in the description of the proposed action; and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the lesser long-nosed bat. No critical habitat has been designated for this species; therefore, none will be affected. Our conclusion is based on the following:

1. Death and injury of some bats (31 per year) is expected as a result from collision with towers, but this number is small in comparison to the known numbers of lesser long-nosed bats throughout their range, and populations appear to be increasing or stable at many roost sites in Arizona and Mexico.

2. The project is anticipated to increase the possibility of disturbance to lesser long-nosed bats at the Bluebird Mine, Copper Mountain, and Agua Dulce Mountains roost sites as CBV and USBP traffic is redirected to near these roosts. We expect the risk of this occurring will increase initially and then begin to decrease beginning about one year after the towers become operational; however, it will be minimized by DHS' commitment to deploy additional technology and agents to supplement tower technology and to only enter roosts in emergency or exigent circumstances. Additionally, risk of entry into Bluebird Mine is minimized by security fencing that surrounds the mine entrance.

3. While we are aware of CBVs entering and causing abandonment of lesser long-nosed bats, we are not aware of any occurrences of USBP entering roosts and causing bats to abandon them. Therefore, we anticipate the likelihood of this occurring is relatively low in any one year of the project, and it is likely to decline over time as operational control of the AOR is achieved.

4. The project will result in direct loss of 25.3 acres of lesser long-nosed bat foraging habitat; however, disturbance to and loss of foraging habitat and forage plants will be minimized through implementation of multiple BMPs, including avoiding or, if they cannot be avoided, salvaging or replacing (at a 3:1 ratio) lesser long-nosed bat forage plants. Furthermore, the anticipated extent of disturbance to foraging habitat is very small compared to what is available in the action area, or throughout the distribution of the species.

5. BMPs and offsetting measures will reduce and offset many of the adverse effects of the action. A proposed study will provide new information on foraging, movement, and roost sites in the action area. Roost sites where human use is likely to increase as a result of the proposed action will be protected through gating, fencing, etc., as appropriate. Implementation of the monitoring plan will help to ensure lesser long-nosed bat tower-related mortality is documented and minimized.

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including any conservation measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR 17.3). "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

We anticipate incidental take of lesser long-nosed bats as a result of this proposed action in the form of direct mortality or injury as a result of collision with towers, harassment due to the effects of human disturbance at roosts associated with the project, and harm due to the potential effects to foraging from noise, lights, human activity, and electromagnetic emissions.

Specifically, incidental take is anticipated as follows:

1. Up to 31 lesser long-nosed bats per year (average of 3.4 bats per towers at TCA-AJO-003, 004, 170, 189, 204, 216, 302, 303, and 310) in the form of direct mortality or injury as a result of collision with towers. We anticipate that mortality associated with collisions will be difficult to detect. As a result, the observed level of mortality will represent only a proportion of the actual mortality; lesser long-nosed bats may be injured but die elsewhere, scavengers will remove carcasses prior to monitoring, and identification of bat carcasses to species may not be possible. As a result, we find that roughly a third of the bats killed or injured (10) are likely to be detected through

monitoring. As described in the offsetting measures for bats, CBP will implement a monitoring program to document and assess tower related mortality of lesser long-nosed bats beginning once tower construction is completed and continuing five years after the towers are operational. CBP will notify us if lesser long-nosed bat mortality is documented at tower sites. Additionally, in accordance with provisions in this opinion, CBP shall report all lesser long-nosed bat mortality and injury associated with the towers and other aspects of the proposed action detected at any time throughout the duration of the Ajo 1 project (i.e., until towers are fully removed).

2. Up to all bats in one roost in the form of harassment from the date of this opinion to one year after the towers become operational, or up to all bats in one roost every 5 years thereafter. Harassment will result from disturbance to lesser long-nosed bats at a roost due to USBP entry. This incidental take will be indicated by USBP entry into a roost occupied by lesser long-nosed bats and subsequent temporary (no more than a year) abandonment of a roost, such as occurred at Bluebird Mine. Monitoring and reporting requirements will allow us to assess these events.

3. An unquantifiable number of bats in the form of harm due to contraction of foraging range caused by avoidance of noise, lights, human activity, and electromagnetic emissions caused by the project. Although we cannot quantify the number of bats likely affected, we do not believe incidental take will occur at a level that would result in declines in bat occupancy in action area roosts.

Although incidental take of bats resulting from the study to evaluate roost occupancy patterns and to identify unknown roosts (bat offsetting measure #2) is possible, any such take that results from that study will be addressed by the section 10(a)(1)(A) permit issued to the entity conducting that work.

Reinitiation will be required if 1) more than a total of 10 bats per year (as described above) are found dead or injured at the base of towers, indicating collision with the towers or 2) USBP enters a roost occupied by lesser long-nosed bats more than once from the date of this opinion to a year after towers become operational, or more than once every five years for the life of the project, or if lesser long-nosed bats abandon a roost as a result of USBP entry for more than one year.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measure(s) are necessary and appropriate to minimize take of:

1. CBP shall report incidental take resulting from the proposed action to the FWS.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, CBP must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure #1 for the lesser long-nosed bat:

a. In addition to the reporting requirements already specified as part of the proposed action, CBP, or their agents shall report to FWS:

1) All lesser long-nosed bat mortality or injury associated with the towers detected at any time throughout the duration of the Ajo 1 project (i.e., until towers are fully removed) via electronic mail and phone call within 48 hours of detecting the dead or injured bat. The electronic mail will include the following details: a) a description of the location (e.g., tower number, location in relation to the tower) where the dead or injured bat was found, b) the date and time when the bat was found, c) a photograph of the bat, if possible, d) if known, a description of how the bat died or was injured, and e) any other pertinent details. This term and condition does not require additional environmental monitors above and beyond those required in the BMPs and offsetting measures.

2) USBP entry into any cave or mine site occupied by bats via electronic mail to us and the land manager immediately upon resolution of the exigent or emergency circumstance that warranted entry into the site. The electronic mail will include the following details: a) coordinates (if obtained) and a description of the location of the cave or mine site, b) the date and time of the entry, c) a description of why entry was warranted and the outcome of the incident, d) a description of any visible damage to the cave or mine sustained as a consequence of CBV entry, e) if detected, a description of any bat mortality, injury, or disturbance that resulted from entry into the cave or mine and e) any other pertinent details.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. CBP must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

DESERT (QUITOBAQUITO) PUPFISH
STATUS OF THE SPECIES

The desert pupfish (*Cyprinodon macularius*) was listed as endangered species with critical habitat in 1986 (U.S. Fish and Wildlife Service 1986). The Quitobaquito, or Sonoyta, pupfish (C. *eremus*) was previously considered a subspecies of desert pupfish (*C. m. eremus*), but was recognized as a distinct species in 2000 (Echelle *et al.* 2000). This is a small fish (5 cm (2 in) long) with a smoothly rounded body shape and narrow, vertical dark bars on the sides. Breeding males are blue on the tops and sides, and have yellow fins. Females and juveniles have tan to olive colored backs and silvery sides. It is found in shallow water of desert springs, small streams, and marshes below 1,515 m (5,000 ft) elevation. The species tolerates high salinities and high water temperatures.

The desert pupfish was once common in desert springs, marshes, backwaters, and tributaries of the Rio Sonoyta, San Pedro River, Santa Cruz River, lower Gila River, and lower Colorado River drainages in Arizona, California, and Mexico. Currently, it is restricted to three natural populations in California and the non-natural irrigation drains around the Salton Sea. It is also found in restricted locations in Sonora and Baja California, Mexico. One natural population still occurs in Quitobaquito Spring and Pond in Pima County, and reintroductions have been made in Pima, Pinal, Maricopa, Graham, Cochise, La Paz, and Yavapai counties, Arizona. Threats and causes of decline include the introduction and spread of predatory and competitive fishes, water impoundment and diversion, water pollution, stream channelization, and habitat modification. A number of populations are maintained in captivity, including one at Dexter National Fish Hatchery in Dexter, New Mexico. Reintroductions are planned for the lower Gila and Colorado River drainages. A recovery plan was completed in 1993.

The Quitobaquito pupfish historically occupied springs, cienegas, shallow pools and slow, shallow stream flows over sandy substrates in the Rio Sonoyta basin, including Quitobaquito Springs (Miller *et al.* 2005). Although the Quitobaquito pupfish is listed under the ESA as the desert pupfish, the status of the species is currently under review and it is assumed that it will in time be listed as a separate species with a similar status (endangered) as the desert pupfish. Critical habitat was designated for the desert pupfish in Arizona at Quitobaquito Springs in Pima County and in California along parts of San Felipe Creek, Carrizo Wash, and Fish Creek Wash. The critical habitat at Quitobaquito Springs is shown in Figure 2-2 of the BA. The listing document (U.S. Fish and Wildlife Service 1986) and recovery plan (U.S. Fish and Wildlife Service 1993) are incorporated by reference.

ENVIRONMENTAL BASELINE

A. Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The FWS has determined that the action area for the Quitobaquito pupfish is the Quitobaquito pond, the springs and channel that feed the pond, the riparian vegetation around the pond and springs (about 42 acres), and areas immediately upstream of the riparian area that could affect the pupfish and its habitat through erosion or sedimentation, if degraded by off-road activities

associated with illegal cross-border traffic such as illegal immigration as well as the resulting required law enforcement activities (to include protection of the area by OPCNM law enforcement). Management of the action area is entirely by OPCNM, though CBP has significant border security responsibilities in the area.

B. Status of the Quitobaquito pupfish in Action Area

In the United States, the only natural population of Quitobaquito pupfish occurs in Quitobaquito pond, spring channel, and springs on OPCNM. Refugium populations were established at OPCNM ('La Cienega') and CPNWR visitor centers in the winter of 2004-5. The subsurface aquifer of Aguajita Wash provides water for more than five springs and seeps in the Quitobaquito area, from Aguajita Springs on the southeast to Williams Spring more than 1.5 miles to the northwest. All these springs and the Aguajita aquifer are hydrologically linked. Standardized sampling efforts have been implemented for the pupfish population at Quitobaquito since 1992, with the exception of 1997-9. The 2003 and 2004 surveys suggested the population was at what is perhaps an average level for Quitobaquito (~6,500 to 10,000 pupfish; National Park Service 2004; U.S. Fish and Wildlife Service 1993). Pupfish inhabit the pond, the entire length of the spring channel, and the southwest spring. Population extremes are likely represented by highs (>15,000 individuals) in 1995, 1996 and 2007 (National Park Service 2007), and low points (5,000-7000 individuals) likely occurred in 1992, 1994, 2000, 2001, and 2005 (Tibbitts 2005), as well as 2008-2009. In most years, population size may vary seasonally with the greatest numbers occurring in the fall (as a result of summer reproduction), followed by a reduction in numbers due to winter and spring mortality (Kynard and Garret, 1979, as cited by Arizona Game and Fish Department 2009).

Threats to the species at OPCNM include loss of, or damage to, the structural or physical integrity of the pond, berm, springs, or springs collecting pipe; drought; pollutants (due to its nearness to Mexico Highway 2, Quitobaquito may be subject to aerial pollutants); and the risk of contamination from a chemical spill associated with a vehicle wreck on the highway and introduction of non-native species, particularly non-native fish or crayfish (McMahon and Miller 1985, Hendrickson and Varela 1989, Arizona Game and Fish Department 2009). Individual non-native fish, turtles, and tamarisk (*Tamarix ramosissima* or *chinensis*) have been documented at Quitobaquito but were subsequently removed. OPCNM biologists continually monitor Quitobaquito for non-native species. Discharge from the Quitobaquito springs has diminished by nearly 50% over the past 30 years (Arizona Game and Fish Department 2009). Essentially no water withdrawal or livestock grazing occurs upslope and/or upstream of Quitobaquito; drought is suspected as the primary cause for this depletion.

In 2006 through 2009, the surface elevation of Quitobaquito lowered to levels unprecedented since dredging and related modifications occurred in 1962. In these years, the pond reached progressively lower low levels, resulting in large temporary reductions in total water volume and pond surface area. This was assumed to have equated to reductions in habitat for pupfish. With loss of the pond seeming imminent, 1,048 Quitobaquito pupfish and 13 Sonoyta mud turtles were evacuated to temporary holding facilities at the Arizona-Sonora Desert Museum. The reductions in pond level are believed to be due to a combination of structural and/or physical deficiencies in the Quitobaquito system. Since 2006, OPCNM staff personnel have been conducting extensive

efforts to improve and maintain spring trenches and water-collecting infrastructure at the springheads, as well as to detect and repair a suspected leak in the pond. They have also transported water to the pond to maintain water levels.

In the summer of 2009, approximately 4,500 ft^2 of the southeastern corner of the pond was isolated by constructing a temporary coffer dam. All possible Quitobaquito pupfish and Sonoyta mud turtles were either relocated from the southeastern corner to the remaining pond (pupfish) or removed for temporary safekeeping offsite (mud turtles). The southeastern corner was then emptied of water, mud, and detritus. The retaining berm was widened inward approximately 4 feet, using compacted clean fill material. A bentonite wall was built into the center of this enlargement of the berm. Finally, the pond bottom was covered with about 6" of compacted bentonite and fill mixture. The total rise in water level since the southeastern corner renovation is 10.25", with no rain, relatively low spring input, and above-average temperatures much of that time, suggesting the renovation plugged a leak in the berm. OPCNM staff are cautiously optimistic that the problem that caused the drop in water elevation has been remedied. On October 7, 2009, a trespass cow from Mexico walked down the berm to drink at the pond; however, it did not appear to damage the berm.

The future of Quitobaquito pond and springs depends heavily on OPCNM's ability to manage the site, which is currently affected by the threat posed by high levels of CBV activities along the border at OPCNM (i.e., OPCNM biologists and staff cannot freely visit the site to conduct management, maintenance, and monitoring, as they must be accompanied by law enforcement on all visits).

C. Critical Habitat

Critical habitat at Quitobaquito includes "Quitobaquito Spring…and a 100-foot riparian buffer zone around the spring" (U.S. Fish and Wildlife Service 1986). We interpret this to mean Quitobaquito pond and a 100-foot buffer around the pond. The primary constituent elements include "clean unpolluted water that is relatively free of exotic organisms, especially exotic fishes, in small slow-moving desert streams and springs with marshy backwater areas" (U.S. Fish and Wildlife Service 1986). Activities likely to result in destruction or adverse modification of critical habitat were identified in the final rule listing the species and designating critical habitat, and include: 1) withdrawal of water from San Sebastian Marsh, California, that could reduce or destroy habitat; 2) stocking of additional exotic fishes or other non-endemic species into critical habitat, and 3) other activities that could reduce habitat, including geothermal or oil and gas development, stream channelization, intensive recreational use, and the siting of transmission lines, roads, canals, or irrigation ditches within critical habitat (U.S. Fish and Wildlife Service 1986).

EFFECTS OF THE ACTION

No direct impacts to the Quitobaquito pupfish or its critical habitat would occur from the construction, maintenance, or operation of the towers, as none of those activities are proposed near where the species or its critical habitat occurs (the tower nearest to Quitobaquito is TCA-AJO-003 which is approximately 3 miles away). However direct effects are anticipated from

USBP operations, and indirect effects, as a result of a shifting of CBV activity, could also affect Quitobaquito. If CBVs shift their activity to Quitobaquito pond and springs, these areas may experience increased CBV traffic and required USBP response. Increased activity at Quitobaquito could cause impacts to the pupfish and its critical habitat. It is difficult to assess the likelihood of changes in CBV activity at Quitobaquito due to the towers. However, the risk of CBV traffic being redirected near Quitobaquito will be minimized because CBP has committed to deploy agents, sensors, MSS units, and other technology to supplement tower technology.

Impacts may occur from CBVs damaging the pond or springs and surrounding area, contaminating the pond or springs, or directly removing fish from the pond or spring. To date, though CBVs have been documented at or near Quitobaquito, no significant impacts caused by CBVs to Quitobaquito pond, springs, or pupfish have been definitively documented (but see "Cumulative Effects", below).

USBP vehicles have driven several times recently on the berm that impounds Quitobaquito pond. Evidence of driving on the berm was noted in an OPCNM database on May 13, 2008; November 20, 2008; March 4, 2009. June 11, 2009; September 4, 2009; and October 7, 2009; however, staff have also informally observed tracks about 10-15 times in the last two years. The tracks often show tread types characteristic of USBP vehicles, although other unauthorized vehicles have likely driven on the berm as well (T. Tibbitts pers. comm. 2009). OPCNM has recently placed sandbags at the western end of the berm to discourage vehicle traffic.

Because of recent reconstruction of the berm, it is not yet fully stable (T. Tibbitts pers. comm 2009). Driving on the berm could cause its partial collapse or deterioration. If the integrity of the berm is compromised, much or all of the pond could be lost if the berm collapses. Even if the berm does not collapse, driving on it could cause deterioration, resulting in materials spilling into the pond, decreasing its volume, reducing habitat for pupfish, and requiring additional work to repair and reinforce it. These activities would likely result in mortality of pupfish and, at least temporarily, reduce the population. A worse outcome would be if a USBP vehicle slid into the pond, either due to collapse of the berm or driving too close to the edge followed by accidental slippage off the berm and into the pond. Contaminants in the form of oil or other vehicle fluids could cause mortality of pupfish, and again, any remedy of this situation would threaten the integrity of the berm and likely result in additional mortality of pupfish.

Furthermore, as was documented in October 2009, USBP vehicles could drive over the stream crossing that connects the springs to the pond. The stream flows through an artificial concrete channel designed by the Arizona-Sonora Desert Museum in 1989 to create habitat for pupfish and mud turtles, while supplying a dependable flow of water to the pond. In 1993, 1,160 pupfish were captured in the channel during the annual pupfish census (National Biological Service and National Park Service 1995). Though no significant damage was sustained from this recent incident in which an agent drove over the channel several times in an ATV, such events could affect the flow of water from the spring to the pond. If the concrete channel was broken or damaged, water could be diverted from the channel, resulting in dewatering of the spring channel and possible lowering or drying of the pond. Pupfish inhabiting the channel downstream of the break could desiccate and die under this scenario.

Effects to Critical Habitat

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat. In particular, herein we describe how the proposed action would affect those physical or biological features that are essential to the conservation and recovery of the species, and whether such effects rise to the threshold of destruction or adverse modification. If the proposed action would severely compromise or preclude our ability to recover a species, then that threshold has been exceeded. To evaluate whether critical habitat is likely to be destroyed or adversely modified, we compare the proposed action to recommendations in recovery plans; but we also use guidance in final critical habitat rules, which define those activities or categories of activities that may result in destruction or adverse modification of critical habitat.

Effects to critical habitat are similar to those described above. The primary constituent element of "clean unpolluted water" could be adversely affected if a vehicle slid off the berm and into the pond, potentially leaking oil and other fluids that would likely be toxic to pupfish. The primary constituent element of "springs with marshy backwater areas" could also be compromised if the berm was damaged or collapsed, draining the pond partially or entirely.

The likelihood of these events is difficult to assess. However, there has never been damage to the berm or the stream channel from USBP operations. Yet the recent USBP vehicle activity on the berm and the incident of the agent driving back and forth across the concrete channel illustrate the possibility that real damage could occur, especially given the long-term nature of the proposed action (likely many years). USBP vehicles have been on the berm several times in the last two years. The risk of these impacts occurring may increase within the first year after the towers become operational, as we expect an initial increase in enforcement activity. However, as described in the description of the proposed action, USBP anticipates that the implementation of tower technology will result in an eventual overall reduction of CBV activity throughout the AOR. Therefore, as USBP gains greater effective control of the border in the Ajo AOR (about one year after the towers become operational), we expect the risk of CBV and USBP impacts to Quitobaquito pupfish and its critical habitat should decrease.

USBP activities at and near Quitobaquito have beneficial effects, as well, in that they reduce levels of CBVs and the damage they often cause to sensitive habitats such as Quitobaquito. The potential effects of CBVs on the pupfish and its habitat are described under "Cumulative Effects", below.

OPCNM, CPNWR, and BLM Activities

No effects to the pupfish or its critical habitat are anticipated due to 1) CPNWR's issuance of a Special Use Permit for activities specified in the description of the proposed action, and 2) BLM's issuance of a ROW for activities specified in the description of the proposed action. These activities will not affect the action area. OPCNM's one time deviation from a

conservation measure in their GMP biological opinion and issuance of a Special Use Permit for activities specified in the description of the proposed action will allow the towers to go forward, with potential indirect effects due to redirection of CBV traffic. Potential effects of such redirection are discussed above.

CUMULATIVE EFFECTS

The action area for the pupfish is managed entirely by OPCNM; thus, many activities that could potentially affect the pupfish and its critical habitat are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, as noted above, trespass cattle as well as activities of CBVs occur in the action area as well, and are not actions of OPCNM. Non-native fishes and turtles have occasionally been discovered at Quitobaquito, which may have been introduced by CBVs. For instance, in August 1993, a black bullhead (*Ictalurus melas*) was removed from the southwest spring at Quitobaquito (National Biological Service and National Park Service 1995). Golden shiners were introduced into Quitobaquito in 1968 or ’69, but were subsequently eliminated (Minckley 1973).

Other CBV activities, including building cooking or warming fires, development and use of trails, discarded clothes, backpacks, food containers, and other materials can all degrade pupfish habitat. If a CBV caused a fire at Quitobaquito, that could be especially damaging to pupfish habitat as a result of ash flow into the pond and degradation of the watershed above the pond. The trend in overall CBV apprehensions and drive-throughs has declined in recent years within the Ajo Station AOR. Within the Ajo 1 project area, however, an increase in these activities was detected from 2008 to 2009, though at least some of the increase is attributable to increased USBP effort, tactical infrastructure, and technology in the area which have improved USBP’s ability to detect and apprehend CBVs (personal communication with USBP, December 2, 2009).

CONCLUSION

After reviewing the current status of the desert pupfish and its critical habitat; the environmental baseline for the action area; the effects of the proposed activities, including 1) DHS’s SBI*net* Ajo-1 Tower project and associated USBP operations, 2) OPCNM’s one time deviation from a conservation measure in their GMP biological opinion and issuance of a Special Use Permit for activities specified in the description of the proposed action, 3) CPNWR’s issuance of a Special Use Permit for activities specified in the description of the proposed action, and 4) BLM’s issuance of a ROW for activities specified in the description of the proposed action; and the cumulative effects, it is our biological opinion that the proposed action is neither likely to jeopardize the continued existence of the desert pupfish, nor likely to destroy or adversely modify its critical habitat. Our conclusions are based on the following:

1. Although there is recent evidence of USBP driving on the berm of Quitobaquito pond and across the stream channel, these activities and other actions by USBP have not yet damaged important features of pupfish habitat.

2. USBP activities reduce levels of CBVs and the adverse effects they cause at Quitobaquito, including the risk of fire, introduced fishes and other organisms, trailing, and discarded trash. Over time, the proposed towers should result in reduced CBV activity and declining USBP response, which reduces the likelihood of adverse effects at Quitobaquito.

3. OPCNM placed sand bags at the western end of the berm that impounds Quitobaquito pond, which should deter vehicle use on the berm.

4. The desert pupfish and its critical habitat occur in other areas of California, Arizona, Sonora, and Baja California that will not be affected by the proposed action.

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including any conservation measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR 17.3). "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

We anticipate incidental take of desert pupfish as a result of this proposed action in the form of:

1) Direct mortality or injury as a result of USBP vehicles driving over the spring channel and mechanically injuring or killing fish. We estimate that up to 5 fish could be killed or injured per event.

2) Harm, if the spring channel was damaged, causing flow to be diverted partially or wholly from the concrete channel. Fish could be spilled out onto the ground, and fish inhabiting the channel downstream of the breakage could die from desiccation. All fish at and downstream of the break (up to 1000s of fish) could be killed per event.

3) Harm, if driving on the berm of Quitobaquito Pond damages the berm, causing sloughing of materials into the pond from the berm; the integrity of the berm is compromised causing collapse

or partial collapse of the berm; or a vehicle slides off the berm into the pond. As many as 1000s of fish could be killed per event.

Reinitiation will be required if mortality events described in 2) and 3) above occur more than once.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species or adverse modification or destruction of critical habitat for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measure(s) are necessary and appropriate to minimize take of:

1. CBP shall not drive motorized vehicles in the Quitobaquito area unless necessary to immediately abate exigent circumstances that threaten the life or safety of officers or CBVs.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, CBP must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure #1 for the desert pupfish:

a. CBP shall not drive motorized vehicles in the Quitobaquito area unless necessary to immediately abate exigent circumstances that threaten the life or safety of officers or CBVs.

i. Not drive off of authorized roads at Quitobaquito in an area that minimally measures 42 acres. This area includes Quitobaquito pond, surrounding densely vegetated areas, the water channel that transfers water from springs located to the north-northwest of the pond to Quitobaquito pond itself and the spring area located up to 0.3 miles north-northwest of Quitobaquito pond. The spring area includes those areas having dry bare salty soil surfaces and those more typical areas with wet soils covered by herbaceous and woody wetland vegetation. Collectively these features contribute to the maintenance of the endangered Quitobaquito pupfish and its critical habitat.

ii. Ensure that all their agents are made aware of the sensitive nature of the Quitobaquito area and the driving restrictions in the Quitobaquito area.

iii. If USBP must drive in these areas to immediately abate exigent circumstances that threaten the life or safety of officers or CBVs, USBP shall, as soon as the situation is

brought under control, contact USFWS-AESO and OPCNM via electronic mail and phone call to report the incident and discuss remedies for any damage incurred. USBP will be responsible for remedying the damage under the supervision of OPCNM or providing funding to OPCNM to remedy the damage. USBP may access any portion of Quitobaquito by foot or on horseback at any time necessary to patrol or to pursue and apprehend cross-border violators. There are foot paths through the Quitobaquito riparian area facilitating access. It is approximately 1,600 feet from the border road or the parking area to the farthest edge of the riparian area. If sign (tracks, etc.) is evident through the Quitobaquito area, it can be followed on foot or by horseback, or vehicles can be driven around and outside of the defined area on authorized roads to ascertain where the CBVs exited Quitobaquito, and then in emergency or exigent circumstances, the tracks/sign can be followed from there via vehicle or other means in accordance with section IV.B of the DHS/DOI 2006 MOU. The USBP and the land managers will provide training on the sensitive nature of this area, which will be taken into consideration for all decisions to enter into this critical area by motorized vehicle.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. CBP must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend implementing the following actions:

1. Participate in the implementation of, including providing ongoing financial support to agencies to implement, the Sonoran pronghorn and lesser long-nosed bat recovery plans.

2. Hire and maintain at least one full-time biologist or environmental specialist in both the Tucson and Yuma Sectors to assist USBP with compliance with ESA, NEPA, and other environmental requirements; to provide environmental training to agents; and to coordinate with agencies regarding environmental issues.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the (request/reinitiation request). As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The FWS appreciates the Department of Homeland Security's efforts to identify and minimize effects to listed species from this project. For further information please contact Erin Fernandez (x238) or Jim Rorabaugh (x230) of our Tucson Suboffice at (520) 670-6150. Please refer to the consultation number, 22410-F-2009-0089 in future correspondence concerning this project.

Sincerely,

Steven L. Spangle
Field Supervisor

cc (hard copy):
Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Refuge Manager, Cabeza Prieta National Wildlife Refuge, Ajo, AZ
Superintendent, Organ Pipe Cactus National Monument, Ajo, AZ
Field Office Manager, Phoenix Field Office, Bureau of Land Management, Phoenix, AZ

cc (electronic copy):
Director, 56th Range Management Office, Luke Air Force Base, Gila Bend, AZ
Director, Range Management Department, Marine Corps Air Station, Yuma, AZ
Gulf South Research Corporation, Baton Rouge, LA (Attn: Chris Ingram)

Chairperson, Tohono O'Odham Nation, Sells, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
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TABLES AND FIGURES

Table 3. A summary of population estimates from literature and field surveys for Sonoran pronghorn in the U.S.

Date	Population estimate (95 percent CI[a])	Source
1925	105	Nelson 1925
1941[b]	60	Nicol 1941
1957	<1,000	Halloran 1957
1968	50	Monson 1968
1968-1974	50 - 150	Carr 1974
1981	100 - 150	Arizona Game and Fish Department 1981
1984	85 - 100	Arizona Game and Fish Department 1986
1992	179 (145-234)	Bright *et al.* 1999
1994	282 (205-489)	Bright *et al.* 1999
1996	130 (114-154)	Bright *et al.* 1999
1998	142 (125-167)	Bright *et al.* 1999
2000	99 (69-392)	Bright *et al.* 2001
2002	21 (18-33)	Bright and Hervert 2003
2004	58 (40-175)	Bright and Hervert 2005
2006	68 (52-116)	Unpublished data
2008	68[c]	Unpublished data

[a] Confidence interval; there is only a 5 percent chance that the population total falls outside of this range.
[b] Population estimate for southwestern Arizona, excluding Organ Pipe Cactus National Monument.

Table 4. Comparison of U.S. Sonoran pronghorn population surveys, 1992-2008.

	Pronghorn observed		Population estimates			
Date	On transect	Total observed	Density estimate using DISTANCE (95 percent CI[a])	Lincoln-Peterson (95 percent CI)	Sightability model (95 percent CI)	Other estimate
Dec 92	99	121	246 (103-584)	---	179 (145-234)	
Mar 94	100	109	184 (100-334)	---	282 (205-489)	
Dec 96	71	82 (95[b])	216 (82-579)	162 (4-324)	130 (114-154)	
Dec 98	74	86 (98[b])	---	172 (23-321)	142 (125-167)	
Dec 00	67	69[b]	N/A	N/A	99 (69-392)	
Dec 02	18	18	N/A	N/A	21 (18-33)[c]	
Dec 04	39	51	N/A	N/A	58	
Dec 06	51	59	N/A	N/A	68 (52-116)	
Dec 08	N/A	N/A	N/A	N/A	N/A	68 [d]

[a] Confidence interval; there is only a 5 percent chance that the population total falls outside of this range.

[b] Includes animals missed on survey, but located using radio telemetry.

[c] Jill Bright, Arizona Game and Fish Department, pers. comm. 2003

[d] Due to poor visibility and low pronghorn sighting rate (some radio-collared pronghorn were detected from their transmitter signals but not seen during the surveys) caused by inclement weather during the surveys and having do resurvey some areas during better weather, the usual survey estimator was not used because it would have lacked accuracy. The estimate of 68 was based on individual seen and missed on the survey and on several recent telemetry flights.

Table 5. Comparison of Mexico Sonoran pronghorn population surveys, 2000-2007.

Date	Pronghorn observed			Population estimate		
	West of Highway 8	Southeast of Highway 8	Total	West of Highway 8	Southeast of Highway 8	Total
Dec 2000						346
Dec 2002			214			280
Dec 2004 Feb 2005	30	439	469	59	625	684
Jan 2006			486			634
Dec 2007	35	325	360	50	354	404

Figure 1. SBI*net* Ajo-1 Tower project area.

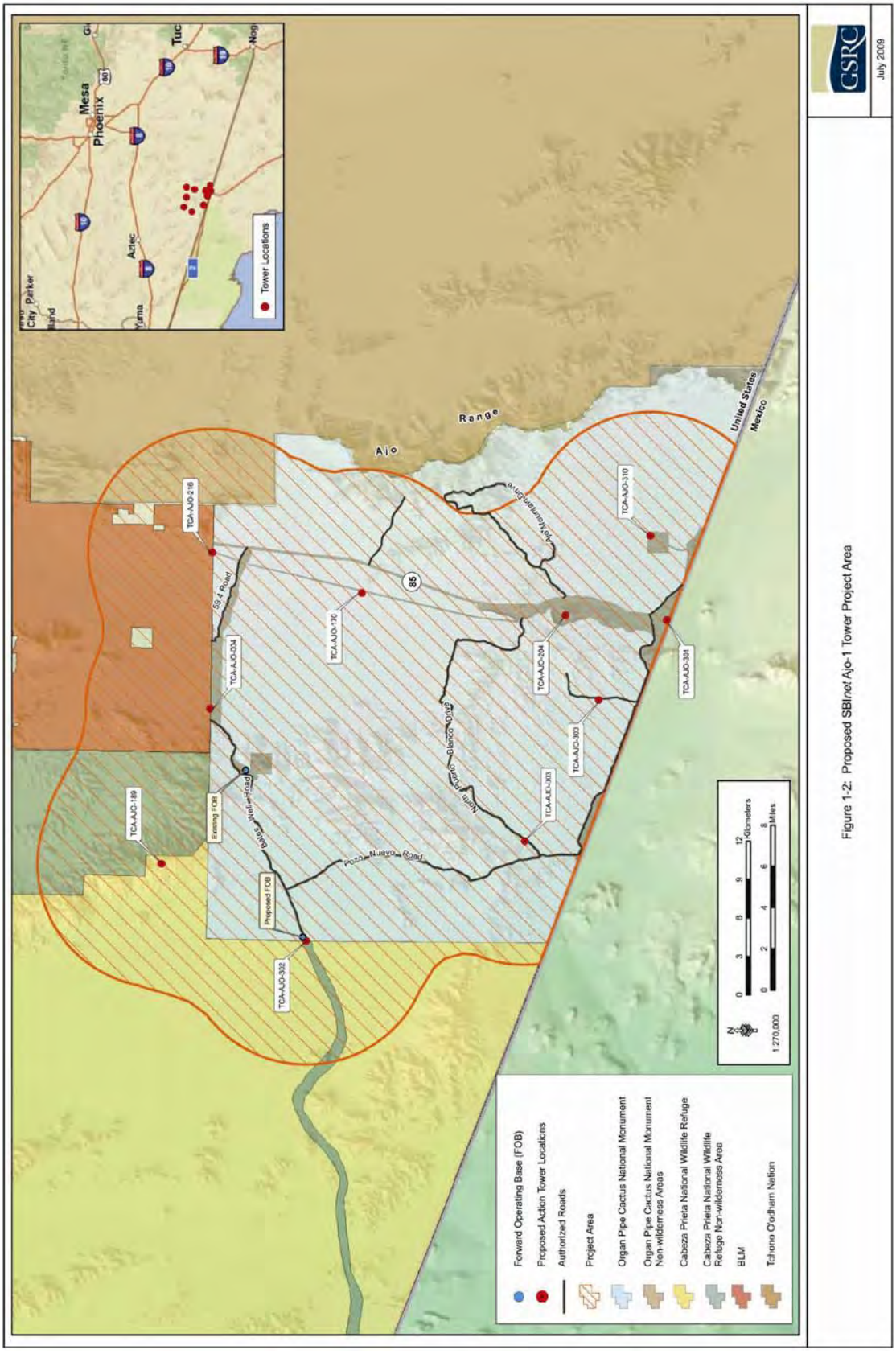

Figure 2. SBI*net* Ajo-1 Action Area.

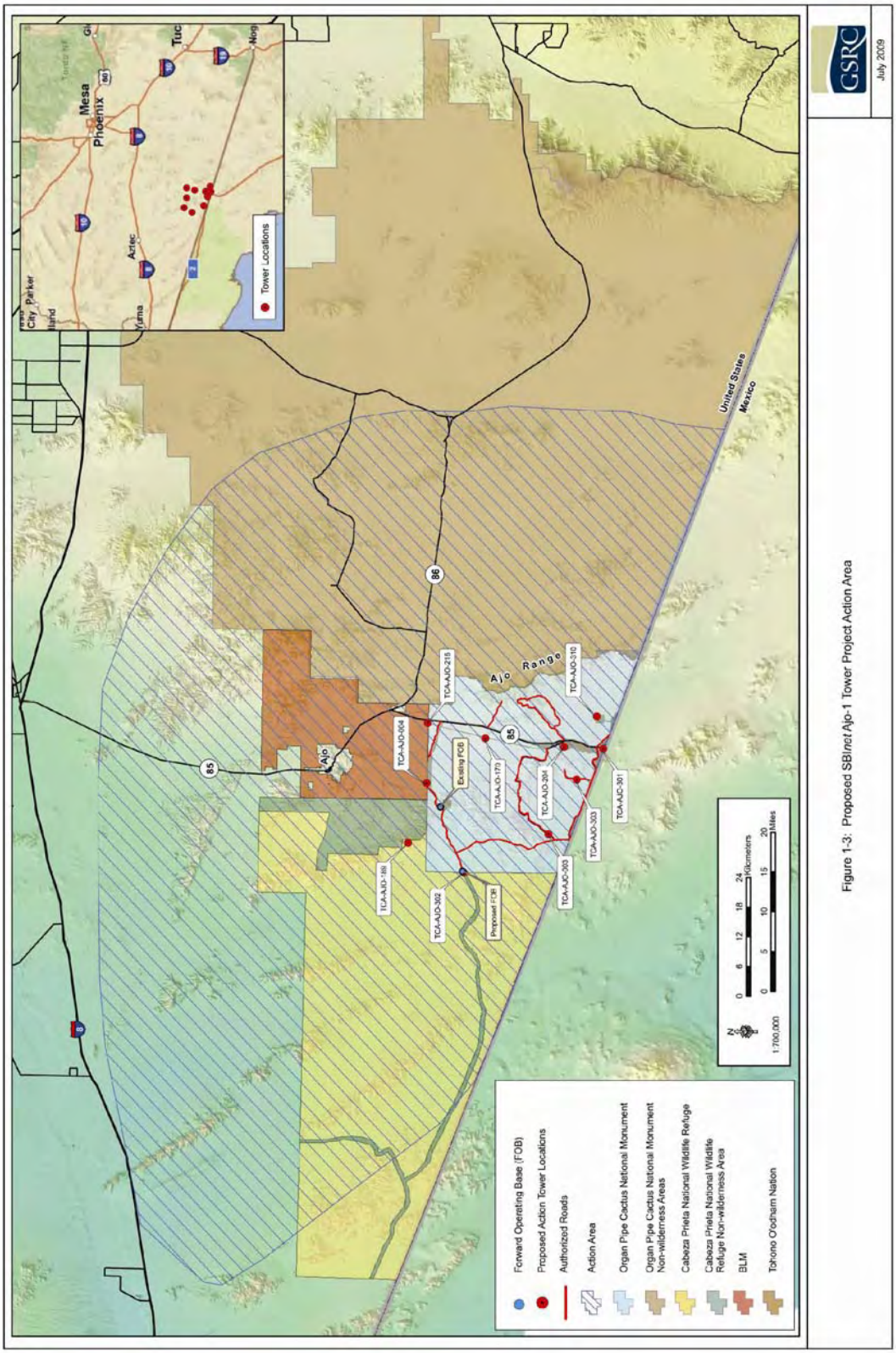

Figure 3. SBI*net* Ajo-1 project map.

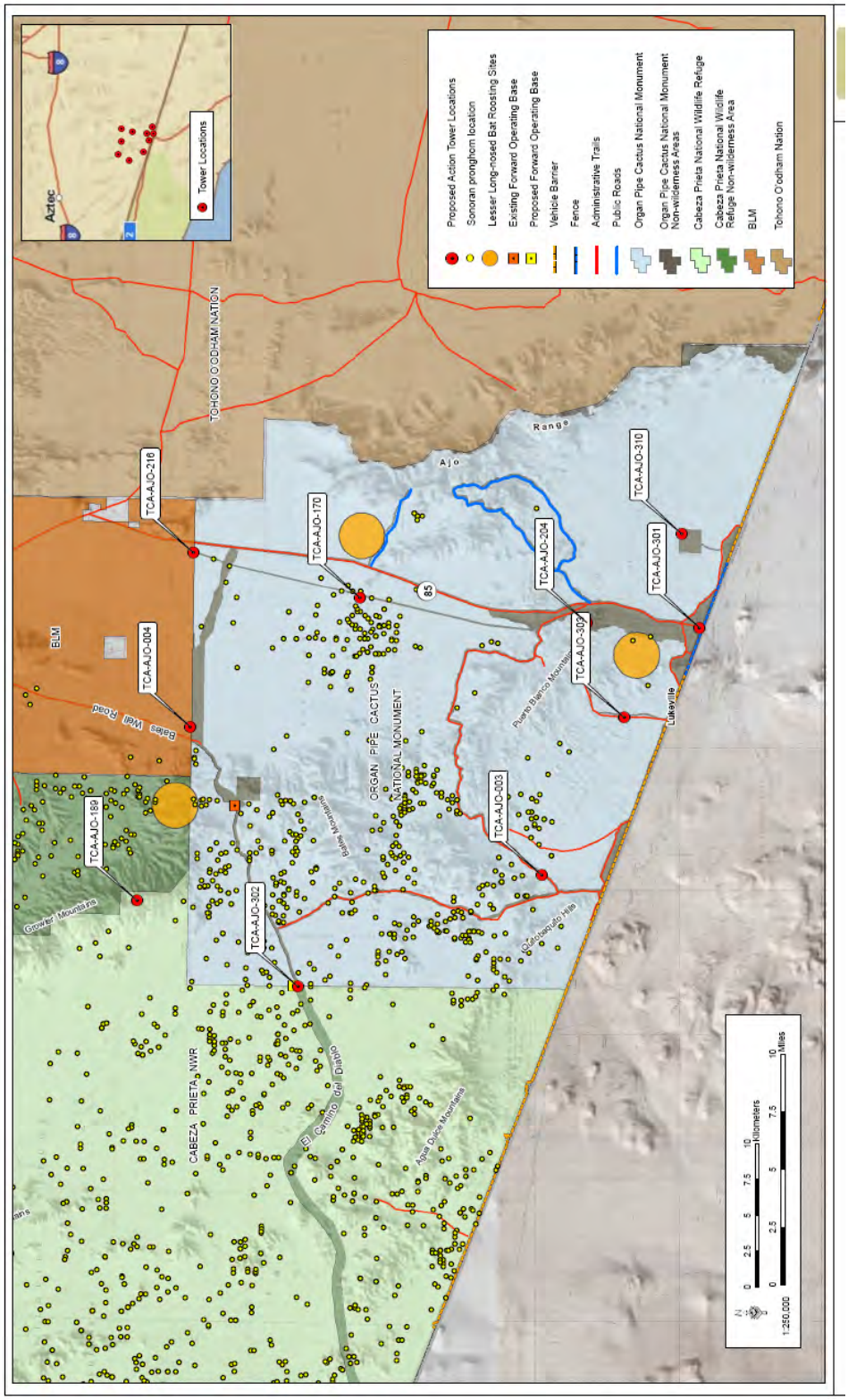

Figure 4. Road segments (in blue) to be maintained as part of the SBI*net* Ajo-1 project.

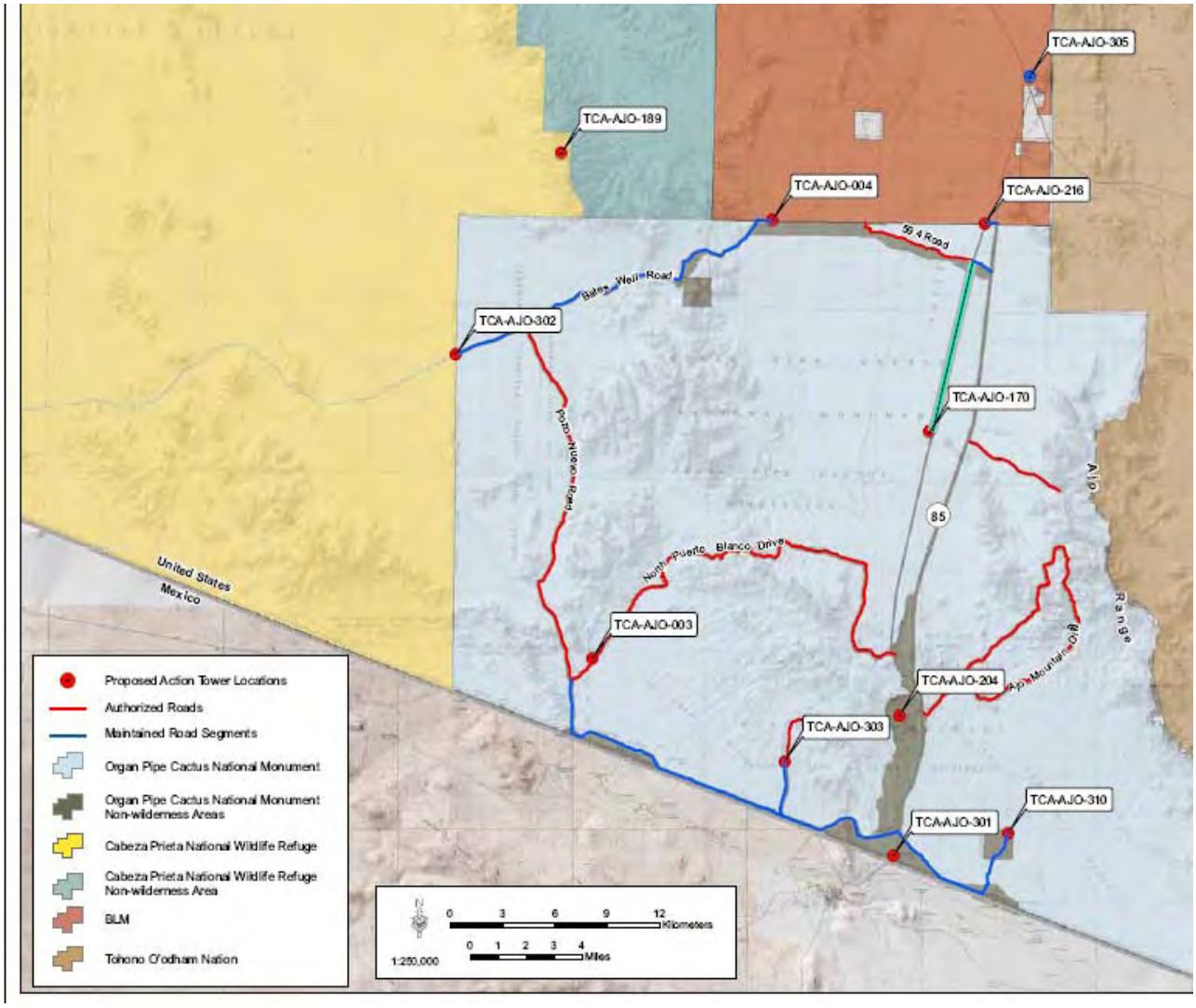

Figure 5. Historical range of Sonoran pronghorn in the Unites States and Mexico.

Figure 6. Current Sonoran pronghorn distribution in the United State: Records from 1994-2001.