United States Department of the Interior

Fish and Wildlife Service

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In Reply Refer To:
AESO/SE
02EAAZOO-2012-F-0200

April 23, 2013

Ms. Jennifer DeHart Hass, Director
U.S. Customs and Border Protection
Environmental and Energy Division
1331 Pennsylvania Avenue NW- NP1525
Washington, DC 20229

Dear Ms. DeHart Hass:

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 (ESA). Your request was received by us on February 11, 2013. At issue are possible effects of the proposed Land Mobile Radio Modernization for Tactical Communications at Buck Peak, Christmas Pass, Cobre, and Granite Mountain (LMRTacCom) along the U.S./Mexico international border in Pima, Santa Cruz, and Yuma counties, Arizona. Additionally, this consultation covers associated approval actions by the FWS's Cabeza Prieta National Wildlife Refuge and the Coronado National Forest such as the issuance of right-of-way easements, special use permits, preparation of a Minimum Requirements Analysis, or a Wildlife Refuge Compatible Use Analysis. The U.S. Customs and Border Protection (CBP) is designated as the lead Federal agency for these actions.

CBP concluded that the proposed project "may affect, and is likely to adversely affect" the endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) and this species is the subject of this Biological Opinion (BO).

CBP also concluded that the proposed action "may affect, but is not likely to adversely affect" the threatened Mexican spotted owl (*Strix occidentalis lucida*) and the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*). We concur with your determination on these species and provide our rationale in Appendix A. CBP has determined that there would be no effect to all other listed species and their designated or proposed critical habitats that occur within the action area for the LMRTacCom project.

The Sonoran desert tortoise (*Gopherus agassizii*) is a candidate species under the ESA. As a candidate, Federal action agencies are not required to consult on this species. We appreciate CBP including this species in the BA, and urge your implementation of the outlined best management practices and other measures to reduce impacts to this species from the proposed project actions. However, effects to this species will not be analyzed as part of this BO.

This BO is based on information provided in CBP's January 2013 biological assessment (BA) addressing the proposed LMRTacCom Project along the U.S./Mexico international border in Arizona, telephone conversations and meetings between our staffs, and other sources of information found in the administrative record supporting this BO. Literature cited in this BO is not a complete bibliography of all literature available on the types of activities included in the LMRTacCom project or the species addressed in this consultation. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

January 2012: FWS receives draft BA.

June 8, 2012: FWS responds to CBP with comments on draft BA.

September 13, 2012: FWS and CBP meet to discuss comments on draft BA and discuss consultation.

November 2, 2012: FWS receives revised BA from CBP.

November 29, 2012: FWS provides comments on the revised BA.

December 4, 2012: CBP provides response to FWS regarding updates to the BA.

December 5, 2012: FWS discusses best management practices and conservation measures related to the Sonoran pronghorn with Cabeza Prieta National Wildlife Refuge and CBP.

December 11, 2012: FWS and CBP hold a conference call to discuss consultation issues.

February 4, 2013: FWS receives the final BA and request for consultation.

March 28, 2013: FWS provided a draft BO to CBP for review and comment.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

LOCATION

The Land Mobile Radio Tactical Communications (LMRTacCom) Modernization Project includes the installation of communications equipment on up to three mountaintop sites (Christmas Pass, Granite Mountain, and Buck Peak) within Cabeza Prieta National Wildlife Refuge (CPNWR) and one mountaintop site (Cobre) within Coronado National Forest (CNF). The four locations proposed by U.S. Customs and Border Protection (CBP) are in Pima, Santa Cruz, and Yuma counties, Arizona (see Figure 1-1).

PROPOSED ACTION

The proposed action includes the installation, operation, repair, and maintenance of radio repeater equipment, and obtaining a special use permit for construction on the subject properties at up to three locations within the CPNWR Wilderness area (Buck Peak, Christmas Pass, and Granite Mountain) and one within the CNF (Cobre). A special use permit or real estate right-of-way would be issued by CPNWR and CNF as part of the proposed action. The issuing of Federal approvals or permits that allow CBP to implement the proposed action is covered by this BO as part of the proposed action.

Radio communications modeling determined the fewest equipment site locations necessary to provide the most coverage possible. Original project plans called for three sites on the CPNWR (Buck Peak, Christmas Pass, and Granite Mountain); however, after additional modeling, the communications coverage provided by Buck Peak and Granite Mountain was nearly equal to the coverage originally modeled for all three sites. CBP proposes to first install the proposed LMRTacCom equipment at Buck Peak and Granite Mountain. Once the sites are operational, field testing will be used to determine if the models were accurate and adequate communications coverage is provided with only two sites. Field testing involves communications checks along currently used patrol routes to determine if there are any remaining communications “dead spots.” If communications coverage is not adequate, or does not meet the requirements of the U.S. Border Patrol (USBP) Wellton or Ajo stations, USBP Yuma or Tucson sectors, or CPNWR, then the proposed LMRTacCom equipment at Christmas Pass site would be installed. Each of the proposed LMRTacCom equipment locations is on a remote mountaintop or ridge. None are protected by a security fence, and they are accessible only by helicopter. Due to the weight of the equipment and steep rugged terrain, all equipment and personnel would be airlifted to the site during the installation phase of the project. Any equipment or materials not needed at the site will be removed from the site. No welding would occur on-site. Installation would take less than 30 days at each site. Thereafter, scheduled maintenance and repair or replacement of faulty equipment would occur twice per year by helicopter. Any replaced equipment would be recycled or otherwise disposed of properly. Trips for emergency repairs may be necessary in addition to the biannual maintenance

trips. All LMRTacCom equipment would be installed on a pre-assembled sled, which would look similar to the existing U.S. Air Force (USAF) equipment on Granite Mountain. Each of the proposed LMRTacCom equipment locations is discussed in detail below.

Buck Peak

Buck Peak is located on a ridge in the CPNWR Wilderness Area in Yuma County, Arizona (see Figure 1-1). Buck Peak currently houses existing CBP communications equipment (one low-power repeater), which is collocated on a solar-powered radio site that is owned and operated by CPNWR. The existing equipment would be replaced because it is outdated and no longer meets CBP's operability requirements. Communications equipment for CPNWR would be updated and collocated at the new CBP facility. The replacement of CPNWR equipment is included as part of this proposed action. The proposed action consists of issuing a special use permit to CBP, the installation of the equipment, and issuing a right-of-way permit for the, operation, repair, and maintenance of communications equipment owned by CBP and CPNWR at Buck Peak. The total surface area required for the radio repeater equipment is approximately 200 square feet. An additional 2,500-square-foot working area would be temporarily disturbed during installation for helicopter landing and workspace needs. Communications equipment to be installed at Buck Peak includes:

- Six mini-solar array platforms that would house solar panels
- Two LMR repeaters
- Duplexers
- SAFARI Commander Station
- One platform-mounted battery enclosure with six batteries
- Two 10-foot-tall poles (one omni-directional dipole array and one grid parabolic antenna)
- Daniel 12.6 Vdc (25 watt) repeater (CPNWR)
- VHF Antenna – dB224 (CPNWR)

The radio repeater equipment would be placed by a helicopter and leveled with lumber if necessary. A grounding system would be necessary to minimize lightning damage to the communications equipment. It would require covering the grounding cables with existing rocks found on-site. Solar panels would be installed on platforms with adjustable legs that require no ground preparation for installation. The platforms house the solar panels and a battery compartment. The batteries are sealed and housed in metal and plastic containers for leak containment. There will be no fuel-based generator used on-site. Maintenance and repair access would be accomplished by helicopter. All helicopter access will originate from Wellton and fly a course west of Copper Mountain and enter the refuge and Buck Peak from the west side of the Cabeza only (see Figure 1-2). This should essentially eliminate any potential effects to pronghorn or disturbance in proximity to pronghorn habitat, and helicopter flights can occur during the pronghorn fawning season (March 15 – July 15). If, for some reason, the flight access for this project is not able to follow this route, no helicopter access would occur between March 15 and July 15 to avoid the Sonoran pronghorn fawning season. No fencing surrounds the site, and no guy wires or lighting would be installed at the site. All aspects of equipment installation, including ground disturbance, would be limited to the previously

disturbed area in the immediate vicinity of existing equipment. The replacement of existing equipment would occur over a 30-day period and necessitate hand tools, drills, cable, rock anchors, and epoxy. It is estimated that surveys and installation would require 16 round trips by helicopter to provide access for installation technicians to remove existing equipment and for the delivery of new equipment.

Christmas Pass

Christmas Pass is located on a mountaintop in the CPNWR Wilderness Area in Yuma County, Arizona (see Figure 1-1). Communications equipment does not currently exist at this site. This communication facility would only be installed if it is deemed necessary to fill a communications coverage gap after the Buck Peak and Granite Mountain sites are installed and operational. If the LRMTacCom equipment is installed at this location, CPNWR radio repeater equipment will be collocated on the equipment sled.

The proposed action consists of issuing a special use permit to CBP, the installation of equipment, and issuing a right-of-way permit for the operation, repair and maintenance of communications equipment at Christmas Pass. The total surface area required for the communications equipment is 125 square feet. An additional 2,500-square-foot working area would be temporarily disturbed during installation for helicopter landing and workspace needs. Communications equipment to be installed at Christmas Pass includes:

- One 14-panel solar array platform
- One repeater (a possible 2nd repeater for CPNWR may be installed.)
- SAFARI Commander station mounted on the platform
- One platform-mounted battery enclosure with four batteries
- One 10-foot-tall pole with a half-parabolic antenna and an omni-directional dipole array
- One 10-foot-tall pole with an omni-directional dipole array
- One tripod-mounted BA40-41 very high frequency (VHF) antenna

The communications equipment would be placed by a helicopter and leveled with lumber if necessary. A grounding system would minimize lightning damage to the communications equipment. It would require covering the grounding cables with existing rocks found on-site. Solar panels would be installed on platforms with adjustable legs that require no ground preparation for installation. The platforms house the solar panels and a battery compartment.

The batteries are sealed and housed in metal and plastic containers for leak containment. There will be no fuel-based generator used on-site. Maintenance and repair access would be accomplished by helicopter or on foot, depending on season of year, the physical condition of the technician, and the amount of material needed to be hauled to the site. The proposed flight access for this site is a western approach that will essentially avoid effects within pronghorn habitat (see Figure 1-2) and flights can occur during the pronghorn fawning season. If for some reason flight access to this site is not able to be from the proposed western approach, no helicopter access would occur between

March 15 and July 15 to avoid the Sonoran pronghorn fawning season if flight access is through Sonoran pronghorn habitat. No fencing surrounds the site, and no guy wires or lighting would be installed at the site. Installation of equipment would occur over a 30-day period and necessitate hand tools, drills, cable, rock anchors, and epoxy. It is estimated that surveys and installation would require seven round trips by helicopter to provide access for installation technicians and to deliver new equipment.

Cobre

Cobre is located atop a remote ridge on the CNF in Santa Cruz County, Arizona (see Figure 1-1). There is no existing communications equipment at the Cobre LRMTacCom site. The proposed action consists of issuing a special use permit and the installation, operation, repair and maintenance of communications equipment at the Cobre LRMTacCom site. The total surface area required for the communications equipment is 250 square feet. An additional 2,500-square-foot working area would be temporarily disturbed during installation for helicopter landing and workspace needs. The location of the working area would avoid the disturbance of woody vegetation. Communications equipment to be installed at the Cobre TacCom site includes:

- One 14-panel solar array platform
- Two receivers
- SAFARI Commander station mounted on the platform
- One platform-mounted battery enclosure with six batteries
- One 10-foot-tall pole with a half-parabolic antenna and an omni-directional dipole array

The communications equipment would be placed by a helicopter and leveled with lumber if necessary. A grounding system would minimize lightning damage to the communications equipment. It would require covering the grounding cables with existing rocks found on-site. Solar panels would be installed on platforms with adjustable legs that require no ground preparation for installation. The platforms house the solar panels and a battery compartment. The batteries are sealed and housed in metal and plastic containers for leak containment. There will be no fuel-based generator used on-site. Maintenance and repair would be accomplished by helicopter.

Granite Mountain

Granite Mountain is located on a remote ridge in the CPNWR Wilderness Area in Pima County, Arizona (see Figure 1-1). The USAF currently operates and maintains communications equipment on Granite Mountain). Collocation of the LMRTacCom communications equipment on the same impact area as the USAF equipment is not possible for the following reasons: 1) the two sets of equipment run on different power systems (USAF equipment requires 48 volts, LRMTacCom equipment requires 12 volts), 2) adding antennas and solar panels would compromise the structural integrity of the existing platform, and 3) CBP requires approximately 100 feet of horizontal separation from the USAF equipment to avoid radio frequency interference from the USAF

communications equipment. Therefore, the LMRTacCom equipment would be located approximately 100 feet east-northeast of the existing USAF equipment.

The proposed action consists of issuing special use and right-of-way permits, and the installation, operation, repair and maintenance of communications equipment at Granite Mountain. The total surface area required for the communications equipment is 30 square feet. If, for some reason, the existing helipad at this site is not able to be used, an additional 2,500-square-foot working area may be needed and would be temporarily disturbed during installation for helicopter landing and workspace needs.
Communications equipment to be installed at Granite Mountain includes:

- One 5-panel solar array platform
- One repeater
- SAFARI Commander station mounted on the platform
- One platform-mounted battery enclosure with four batteries
- One 10-foot-tall pole with a half-parabolic antenna and an omni-directional dipole array
- One tripod-mounted BA40-41 VHF antenna

The communications equipment would be placed by a helicopter and leveled with lumber if necessary. A grounding system would minimize lightning damage to the communication equipment. It would require covering the grounding cables with existing rocks found on-site. Solar panels would be installed on platforms with adjustable legs that require no ground preparation for installation. The platforms house the solar panels and a battery compartment. The batteries are sealed and housed in metal and plastic containers for leak containment. There will be no fuel-based generator used on-site. Maintenance and repair access would be accomplished by helicopter. No helicopter access would occur between March 15 and July 15 due to the Sonoran pronghorn fawning season, except under emergency conditions i.e. a system failure prevents operation of the system.

The proposed installation does not include a security fence. No guy wires or lighting would be installed at the site. Installation of equipment would occur over a 30-day period and necessitate hand tools, drills, cable, rock anchors, and epoxy. All aspects of equipment installation, including any ground disturbance, would be limited to the previously disturbed area in the vicinity of the existing equipment. There is a partial barbed wire fence at the proposed site. No security fencing is proposed for the site. It is estimated that surveys and the installation of equipment would require 12 round trips by helicopter to provide access for installation technicians and to deliver new equipment.

Best Management Practices

The following best management practices (BMPs) were compiled from previous consultations with FWS regarding the potentially affected species, the FWS Information, Planning and Consultation System (https://ecos.fws.gov/ipac/), and through formal consultation with the FWS. The following BMPs will be implemented at all proposed LMRTacCom locations where practicable. Because not all BMPs are applicable to all species, a description of potential effects and BMPs for each

potentially affected species is provided in Sections 3 and 4 of the BA. The following is a general summary of BMPs. Please refer to the BA for a complete description of BMPs.

Best Management Practice 1 (General Construction – BMP1)
BMPs will be developed and implemented as standard operating procedures during all construction activities within or near habitats occupied by, or potentially occupied by, listed species and will include:

BMP1a - proper handling, storage, and disposal of hazardous and regulated materials and other waste
A. All construction will follow DHS *Directive 025-01* for Sustainable Practices for Environmental, Energy, and Transportation Management.
B. Where handling of hazardous and regulated materials does occur, all fuels, waste oils, and solvents will be collected and stored in clearly labeled tanks or drums within a secondary containment system that consists of an over-pack container(s) capable of containing the volume of the largest container stored therein.
C. Nonhazardous waste materials and other discarded materials, such as construction waste, will be contained until removed from the construction and maintenance sites.
D. All food-related trash items, such as wrappers, cans, bottles, and food scraps, will be disposed in closed containers and removed daily from the project site.

BMP1b - minimizing ground disturbance
A. All areas where ground disturbance will occur will be demarcated using flagging or construction fencing, and all activities will remain within flagged boundaries.
B. Standard construction procedures will be implemented to minimize the potential for erosion and sedimentation during equipment installation. All work shall cease during heavy rains and would not resume until conditions are suitable for the movement of equipment and material.
C. CBP will site, design, and install equipment, to avoid or minimize habitat loss within or adjacent to the footprint and minimize the amount of aboveground obstacles associated with the site. The area of disturbance will be minimized by limiting deliveries of materials and equipment to only those needed for effective project implementation.
D. Rehabilitation will include the distribution of organic and geological materials (i.e., sticks and rocks) over the disturbed area to reduce erosion while allowing the area to naturally vegetate.
E. CBP will minimize habitat disturbance by restricting vegetation disturbance to the smallest possible project footprint. CBP will limit the removal of trees, cacti, and brush to the smallest amount needed to meet the objectives of the project. CBP will not remove any ironwood (*Olneya tesota*), paloverde, mesquite (*Prosopis* sp.), agave, barrel cactus, saguaro, organ pipe (*Stenocerus thurberi*), or senita (*Pachycereus schottii*) outside of the permanent footprint. If vegetation other than that identified above must be removed outside the permanent project footprint, CBP will 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.

BMP1c - minimizing disturbance related to human presence
A. The number of trips per day to and from the LRMTacCom sites will be minimized to reduce the likelihood of disturbance of animals in the area.
B. During project activities on CPNWR, CBP will adhere to Leave No Trace principles regarding human waste. Solid human waste will be deposited into catholes, dug 6 to 8 inches deep.
C. CBP will 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.

Best Management Practice 2 (Nonnative and invasive plants – BMP2)
A. CBP will avoid the spread of nonnative plants by not using natural materials (e.g., straw) for on-site erosion control. If natural materials must be used, the natural material would be certified weed and weed-seed free.

Best Management Practice 3 (Migratory Birds – BMP3)
A. CBP will avoid where possible the clearing of vegetation during the migration, breeding, and nesting time frame of migratory birds (February 1 through September 1). When vegetation control must be implemented during February 1 through September 1, a survey for nesting migratory birds will be conducted prior to the start of activities. If an active nest is found, a buffer zone (300 ft.) will be established around the nest and no activities will occur within that zone until nestlings have fledged and abandoned the nest.
B. To the greatest extent practicable, anti-perching or nesting devices may be implemented to deter birds from perching or nesting on the LMRTacCom equipment. CBP will coordinate with FWS if this measure becomes necessary.

Best Management Practice 4 (Area Restrictions – BMP4)
Area restrictions are intended to prevent impacts to individuals and habitats occurring near the proposed action. To reduce potential impacts on Sonoran pronghorn, the following area restrictions will be adhered to:
- CBP will coordinate any trips to LMRTacCom locations for installation or maintenance activities, particularly those in important Sonoran pronghorn areas, with the CPNWR Refuge Manager and AGFD. All maintenance access will be authorized through a special use permit or right-of-way permit. CBP will seek information regarding Sonoran pronghorn locations using telemetry data periodically collected by AGFD and will avoid these locations to the extent feasible.
- Access to the Christmas Pass and Buck Peak sites will be from the west to avoid Sonoran Pronghorn habitat areas. If these access routes are not possible, CBP will coordinate alternative access with CPNWR to avoid or reduced impacts to Sonoran pronghorn.
- Helicopter over-flights for installation or maintenance will not take place within 1 mile of Granite Tank (32.331384°, -113.299146° NAD 83).
- To reduce potential impacts on Mexican spotted owl, helicopter flight paths will be adjusted to climb to higher altitudes to minimize noise emissions within designated Critical Habitat and Protected Activity Centers (PAC) for the Mexican spotted owl. Also, helicopter flight paths will be adjusted to completely avoid PACs and designated Critical Habitat if practicable.

- CBP will avoid restricting water access near proposed LMRTacCom installation sites by identifying and not creating barriers to natural water sources available to listed species.

Best Management Practice 5 (Seasonal Restrictions – BMP5)
Seasonal restrictions are intended to prevent impacts to individual animals and their habitats during breeding seasons (see Table 1-1 in BA). If a seasonal restriction cannot be met, CBP will coordinate with FWS to minimize the potential for impacts on protected species.

Best Management Practice 6 (Species-Specific Measures – BMP6)
A. In Mexican spotted owl habitat, minimize habitat disturbance by restricting vegetation removal to the footprint of the activity. If vegetation must be removed, 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.
B. Agaves will be avoided to the extent practicable to minimize effects on lesser long-nosed bats. Those plants that cannot be avoided will be transplanted.

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. The direct effects of the LMRTacCom project will result from the installation and repair and maintenance of communications equipment on four mountaintop locations. Noise emissions during installation and maintenance, especially when a helicopter is used to access the sites, may affect wildlife at distances up to 1 mile from the takeoff point at the U.S. Border Patrol (USBP) Wellton Station or the Nogales International Airport, along the flight path to the LMRTacCom site, and around the landing area adjacent to each site. The action area for this BO is depicted in Figure 1-2. Indirect effects related to erosion or invasive species may occur as a result of the proposed action.

Management of the vast majority of the action area is 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. CPNWR lies south of BMGR and along the border of Organ Pipe Cactus National Monument and encompasses 860,000 acres. CPNWR is managed to protect, maintain, and restore the diversity of the Sonoran Desert. Most of the refuge is designated as wilderness. CPNWR is 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. In the eastern portion of the action area, Federal lands managed by the U.S. Forest Service's CNF make up the majority of the action area. However, there are also trust lands managed by the State Land Department and areas of private ownership.

Terrain, Vegetation Communities, and Climate in the Action Area

The western portion of 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 in this portion of the action area 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.

The eastern portion of the action area on CNF is characterized by higher elevation areas including mountain ranges such as the San Luis, Atascosa, and Tumacacori mountains. Valleys surrounding these mountain ranges primarily support grasslands, and are also characterized by river systems such as the Santa Cruz River. Drainages within the valleys support important riparian communities. Vegetation communities in the eastern portion of the action area include Madrean Oak woodlands, some coniferous forests, and semidesert grasslands. Summers can be hot in this portion of the action area, but not as hot as the western deserts. Winter temperatures are variable, but are often subfreezing, especially at the higher elevations. Precipitation in the eastern portion of the action area is much greater than in the western deserts and ranges from 11 to 22 inches of annual precipitation.

Monsoon thunderstorms play an important role throughout the action area. The intense monsoon thunderstorms may impact the construction and maintenance of the facilities included in the proposed action.

SONORAN PRONGHORN

STATUS OF THE SPECIES

Description, Legal Status, and Recovery Planning

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 (FWS 1982) was revised in 1998 (FWS 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 2002, a supplement and amendment to the 1998 Final Revised Sonoran Pronghorn Recovery Plan was prepared (FWS 2002). The FWS 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. Survival of the Sonoran pronghorn is precarious and is likely dependent on drastic and untested methods (Krausman et al. 2005). The Sonoran Pronghorn Recovery Plan is currently being updated by a bi-national recovery team. In all planning related to Sonoran pronghorn recover, we have concluded that, in order for recovery actions to be effective, providing an environment of reduced impacts related to anthropogenic activities is essential.

The Sonoran pronghorn is a rare and difficult species to study and monitor. As with most endangered species, there is a lack of extensive studies related to the life history requirements of this species. Studies typically are limited by low samples sizes and difficulty of repeat observations due to the species' rarity. Low sample sizes and limited observations hinder biologists' abilities to obtain statistically rigorous data or adequate data for peer-reviewed scientific publications. The most recent, comprehensive publications related to Sonoran pronghorn were associated with the 2005 Wildlife Society Bulletin (Krausman et al. 2005). Since that time, managers have learned much, but, due to lack of resources, time, and incomplete data, this information is typically exchanged informally, rather than through published literature. Most of the existing information on Sonoran pronghorn is not contained in the peer-reviewed literature (Krausman et al. 2005). This is likely to continue until more resources are available or adequate data is gathered to meet the requirements for publication in a peer-reviewed journal. However, all information that contributes to our understanding of endangered and threatened species' life history requirements and impacts to the species is vital to our management of the species, be it peer-reviewed or personal communications

and grey literature from the professionals working with these species in the field. The best available scientific and commercial data comes from a number of sources including published literature, agency reports, and personal communications with land managers and agency personnel. The FWS has used the best available information related to the Sonoran pronghorn in our analysis below.

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. 1997a, FWS 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. 1997a). 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*) (FWS 1998). Pronghorn will move in response to spatial limitations in forage availability (Hervert et al. 1997b). 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 (FWS 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. 1997a). Home range size of Sonoran pronghorn during 1995-2002 ranged from 16.6 to 1,109 square miles, with an average of 197 $\pm$ 257 square miles (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% ± 0.04 and 92% ± 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.

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 6). 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 State Route (SR) 85 to the east. This area encompasses 2,508 square miles (Bright et al. 2001). Sonoran pronghorn are estimated to be currently limited to < 25% of their historical habitat in Arizona and northern Sonora, Mexico (Krausman et al. 2005).

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 20th century. Sub-population estimates for Arizona, which only began in 1925, have never shown the pronghorn to be abundant (Table 1). 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; Bright and Hervert 2003, 2005) using aerial line transects (Johnson et al. 1991). Sub-population estimates from these transects have been derived using three different estimators (Table 2); currently the sightability model (Samuel and Pollock 1981) is considered the most reliable estimator (Bright et al. 1999, 2001). Table 2 presents observation data from transects and compares estimates derived from the different population models from 1992 through 2010.

The sightability model population estimates from 1992 to 2000 showed a 45 percent decrease in sub-population size (Table 2). 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 (FWS 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. 1997a).

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 habitats where exposure to predators was greater. 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, OPCNM, 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, including activities such as undocumented immigrant, i.e., cross border violator (CBV) traffic, smugglers, and required law enforcement response, as compared to what occurs in the El Pinacate area, may be a 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, 2008, and 2010 aerial surveys resulted in an estimated 58, 68, 68, and 85 (this 2010 estimate does not include the 17 pronghorn released from the pen in December 2010, see below), respectively, pronghorn in the U.S. sub-population (Tables 1 and 2). As of December 2012, we believe that the wild population now numbers over 100, and is estimated at 159 pronghorn (unpublished range-wide survey data). This is a substantial increase brought on by the implementation of ongoing recovery measures and improved range conditions (as a result of

increased rainfall) since 2002. The 2006 to 2010 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 and 2010 surveys observers noted a skewed sex ratio (approximately 2: 1) with more males than females; this affects the rate at which the population may increase.

Although 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 has suggested a number of reasons for this, including high cross border activity, drought, and forage conditions beyond what is compensated for with the implementation of recovery actions. Information provided by land managers in OPCNM suggest off-road vehicle tracks have been seen progressively increasing in extent and density since 2002, throughout that portion of the pronghorn's range U.S. range (electronic mail from Tim Tibbitts, OCPNM 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 and 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 rebound to numbers more in line with historical levels since the 2002 population decline is considered by some Team members to be evidence that human disturbance continues to affect the population, inhibiting its ability to recover. However, it is important to note that pronghorn are likely more resilient to impacts associated with human disturbance and similar stressors during periods of improved forage and water resources. Unfortunately, in recent times, these periods have occurred less often and their occurrence is unreliable. Therefore, in our best professional judgment and based on current observations and predicted climate changes, it is likely that the effects of human disturbance and similar stressors on Sonoran pronghorn will be exacerbated by generally poor habitat conditions during the implementation of the proposed action, although periods of normal or above precipitation are expected to occur throughout the life of this project.

In addition, the low number of females also likely impacts this population's ability to rebound. With efforts to improve forage and water availability and the release of individuals from the captive pens, we may see an improving population trend. If not, factors other than the reduced number of females may be the primary cause of slow population growth or negative population trends.

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 as of January

2012, there were 48 pronghorn in the enclosure. Since establishing the program, 16 pronghorn older than current year have died in the pen due to various causes, including one confirmed case of epizootic hemorrhagic disease, two from malnutrition prior to the introduction of alfalfa hay in the pen, two from bobcat predation, one from entanglement in the fence, and two from capture operations. Eight deaths were from unknown causes and although disease was suspected, it could not be confirmed. Sonoran pronghorn have been released from the pen every year since 2006; as of January 2012, a total of 73 individuals have been released, many of which are known to still be alive.

The objective is to produce at least 20 fawns each year to be released into the current U.S. population, and to establish additional U.S. populations at Kofa NWR and BMGR-East, east of SR 85. The additional populations will be established as experimental, nonessential populations under section 10(j) of the Act. A final Environmental Assessment and final 10(j) rule were published in April and May, 2011, respectively. In December 2011, 13 Sonoran pronghorn were moved from the CPNWR breeding pen to the newly built breeding pen in the King Valley on Kofa NWR. One of the animals died due to capture myopathy, leaving 12 (10 does and 2 bucks) in the pen for breeding purposes.

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; Figure 6). 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 3). 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.

In December 2009, surveys indicated pronghorn numbers increased somewhat with an estimated total of 482 (311 observed) individuals combined for both sub-populations (including 381 pronghorn [258 observed] in the area southeast of Mexico Highway 8 and 101 [53 observed] to the west of the highway). In December 2011, surveys indicated pronghorn numbers declined drastically with an estimated total of 241 (197 observed) individuals combined for both sub-populations (including 189 pronghorn [167 observed] in the area southeast of Mexico Highway 8 and 52 [30 observed] to the west of the highway). This was the lowest ever estimate for a December pronghorn survey in Mexico.

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.

More recent work by Horne (2010) attempted to account for uncertainty that can affect the outcome of PVAs. He conducted a series of PVAs to address various sources of uncertainty. Regardless of the degree or type of uncertainty, active management related to captive populations and establishing additional populations increased the viability of wild Sonoran pronghorn. However, without such active management, the wild population has a high probability of dropping to abundance levels that are unsustainable and a low probability that the population would ever reach an abundance that is higher than 100 females (Horne 2010).

Threats

Barriers that Limit Distribution and Movement

Highways, fences, railroads, developed areas, and irrigation canals can block access to essential forage or water resources. 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. 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 that 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 (a pen-raised radio-collared male is known to have crossed SR 85 and Mexican Highway 2; however, this is considered highly unusual). NPS records include a Sonoran pronghorn found dead just east of SR 85 along Ajo Mountain Drive in 1972. It was suspected to have been struck and killed by a vehicle (electronic mail from Tim Tibbitts, OPCNM, September 1, 2011). More recently, in 2003/2004 John Hervert (AGFD) investigated a Sonoran pronghorn mortality found a few hundred feet from Interstate 8. It had a broken leg, and so vehicle collision was suspected. deVos and Miller (2005) reported that Sonoran pronghorn used areas within 0.6 miles of roads less than those greater than 0.6 miles from roads, demonstrating that non-highway roads can also be restrictive.

Canals have been the cause of four pronghorn deaths since 2008. Three pen-raised pronghorn drowned in the Palomas Canal in 2008 and one pen-raised pronghorn drowned in the Wellton Canal in 2010. De-watering of reaches of the Río Sonoyta and lower Gila River has 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; cross-border violator (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 may be 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 (OPCNM 2001), and an estimated 150,000 people entered the monument illegally from Mexico (Milstead and Barns 2002). Apprehensions of CBVs in the USBP Ajo Station, Tucson Sector increased from 21,300 in 1999 to 22,504 in 2006. The numbers of CBV apprehensions from fiscal year (FY) 2007 to FY 2011 have decreased since 2006, and are shown by location in Table 4. The number of apprehensions and drive-throughs in the Ajo Station's overall Area of Responsibility (AOR) declined after the construction of the border vehicle fences on OPCNM in 2006 and CPNWR in 2009, but has increased since the implementation of the SBI*net* towers and infrastructure became operational in 2010. In the approximately one year since the SBI*net* towers have been operational, the number of apprehensions of CBVs have increased by 85% within OPCNM and 183% in CPNWR. 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, September 1, 2011).

In fiscal year 2005, the Yuma Sector of 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). Apprehensions in recent years have declined in the Wellton Station AOR (see Table 4). Overall, a dramatic decline in apprehensions in the Yuma Sector, particularly in the western portions of the sector, is attributed 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 increased degradation of Sonoran pronghorn habitat, including direct impacts to habitat from vehicles, but also a reduction in access to forage availability, particularly during drought and other periods of poor range conditions. 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 some anecdotal evidence that pronghorn are avoiding areas of high CBV traffic and law enforcement activities (personal communication with Curtis McCasland, CPNWR, 2007). This may be especially true during periods of poor range conditions. For example, according to CBP records, a drag road adjacent to the current Granite Forage Enhancement Plot (FEP) in the Wellton Station AOR was created in 1996 and has been in use since before the FEP was installed. However, at the time the FEP was being planned, this was only a two-track trail with little use (electronic mail communication with John Hervert, AGFD, October 3, 2012). Wellton Station has confirmed that USBP use of this drag road has increased recently in response to an increase in illegal activities in the area. In spring of 2009, AGFD reported that they believe that three does with fawns abandoned the Granite Forage Enhancement Plot (FEP) due to the high amount of USBP activity at the site (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). Plans are currently being made to move the FEP. Instances such as these are more likely to occur during periods of poor range conditions and the impacts are likely exacerbated, regardless of the source of disturbance or impact on the pronghorn.

The Camp Grip Forward Operating Base (FOB), located within the current range of the pronghorn, was established in 2005. In 2011, FWS completed an analysis of whether the Camp Grip FOB resulted in impacts on Sonoran pronghorn movement patterns. FWS analyzed available AGFD Sonoran pronghorn location data from radio-collared animals and results of this analysis were inconclusive as to whether Camp Grip had any impact on Sonoran pronghorn movement; however, as described above under “Distribution and Abundance” there are very few radio-collared animals and documenting pronghorn movement can be difficult. These inconclusive results were also in part due to the many complex factors involving Sonoran pronghorn movement, including artificial feeding and watering of the animals across the species’ range. Initial data from radio-collared pronghorn locations appeared to indicate a potential reduction in use of areas in the vicinity of Camp Grip (electronic mail from Mark Sturm, OPCNM, August 31, 2011). Data from 2012 have shown several occurrences of pronghorn in the vicinity of Camp Grip. This may be due to the increased number of pen-reared pronghorn that have been released and that have been exposed on a more regular basis to human activity at the pens (electronic mail from Jim Atkinson, CPNWR, October 5, 2012). Data also indicate a northerly shift in habitat use since Ajo-1 SBI*net* implementation, which coincides with a documented increase in impacts. This result is despite the presence of abundant and good habitat conditions in areas nearer the border during 2011.

While specific studies related to the physiological effects of disturbance on Sonoran pronghorn are extremely limited, some information regarding how these effects are manifest in other wildlife may be helpful in assessing the potential effects to pronghorn. Physiological effects of noise on wildlife can include stresses to neural, endocrine, digestive, cardiovascular, and immune systems as well as reproductive function, causing changes such as increased blood pressure, available glucose, and blood levels of corticosteroids (Manci et al. 1988, Kaseloo and Tyson 2004, Keay et al. 2006). However, available research evaluating physiological impacts of human stressors on wild animal populations also indicates that the responses of species are variable (Manci et al. 1988, Larkin 1996, Radle 1998, Krausman et al. 1998, Kaseloo and Tyson 2004, Stankowich 2008). We believe that, given the information in the above studies, it is possible that Sonoran pronghorn could have a physiological stress response to disturbance without showing an overt behavioral response. To have a population effect, behavioral and physiological responses to disturbance must ultimately affect survival and productivity, and to date, no research efforts have supported or refuted population level impacts on pronghorn from physiological stress. At some point, increased energetic costs resulting from a stress-related increase in metabolic rate, reduced foraging efficiency due to interrupted feeding, and alarm and flight responses could jeopardize survival and productivity if the disturbance is stressful enough and chronic (Bright and Hervert 2005, deVos and Miller 2005).

As stated above, and though not specifically related to Sonoran pronghorn, 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 and Berger 1994, Primm 1996; as cited by Kerley et al. 2002) or increasing the likelihood of fatal encounters with humans (Kasworm and 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.

Disturbances that cause pronghorns to startle and run would energetically have a more significant effect during times of drought. 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. Using 15% of the Arizona pronghorn population, Landon et al. studied pronghorn use of areas with varying sound pressure (ambient sound) levels and found that pronghorns did not use the areas with different ambient sound levels in proportion to their availability (2003). In general, they found that Sonoran pronghorn select areas with the lower noise levels and avoid areas with the higher noise levels; however, they did not consider habitat in their analysis. Whether pronghorn avoid these areas because of the noise or because of some other human-related factor is unknown; however, the various potential factors (i.e. noise levels, human presence, reduced vegetation or cover, disturbance) are interrelated. Hughes and Smith (1990) found that pronghorn immediately ran 1,310- 1,650 feet from a vehicle, and that military low-level flights (less than 500 feet above the ground) over three pronghorn caused them to move about 330 feet from their original location.

Krausman et al. (2001, 2004, 2005a) examined effects of military aircraft and ground-based activities on Sonoran pronghorn at the North and South tactical ranges (TACs) on the 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). In response to stimuli, on days without stimuli, pronghorn foraged more and bedded less than on days with stimuli; the opposite was true for fawns (Krausman et al. 2001). Krausman et al. (2001) only considered a change in behavior to trotting or running in response to stimuli as biologically significant. Eighty-seven (4.1%) of the 2,128 events with ground-based stimuli resulted in pronghorn changing their behavior to trotting or running; often moving > 10 m (Krausman et al. 2004). Pronghorn tend to exhibit a predator response to human activities, but can habituate to chronic human disturbance in some instances (Krausman et al. 2004). 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 specific conclusions could be drawn about effects of military activities on fawns during the Krausman et al. study, but the data suggests that fawns and their mothers may be more sensitive to anthropogenic stimuli than other pronghorn (Krausman et al. 2004). In general, the study did not detect differences in the behavior of pronghorn with and without anthropogenic stimuli; however, Krausman et al. (2004) recommends that all ground stimuli and activities that alerts or startles females and their fawns should be terminated. However, the long-term behavioral and physiological effects of military activities have not been quantified (Krausman et al. 2004).

The proposed action would result in additional human presence and activity, including helicopter flights, within the range of the Sonoran pronghorn. And, while the noise and activity associated with proposed action may be somewhat different than that described in the studies above, it is anticipated that the proposed action will potentially result in some disturbance of Sonoran pronghorn. While baseline levels of human activity are already relatively high in certain portions of the range of the Sonoran pronghorn, additional disturbance as a result of the proposed action, particularly in those areas that do not have access to the general public, will contribute to the potential for disturbance of pronghorn in the project area. Habituation by pronghorn to disturbance

is more likely to occur if the disturbance is consistent or predictable. Krausman et al. (2004) report that animals, in general, minimally habituate to intermittent sounds, and that any habituation is gradual. Most of the actions associated with the proposed action will occur at irregular intervals, reducing the ability of pronghorn to habituate to the activity. However, some degree of habituation may occur because of the baseline levels of human activity already occurring on the landscape. Regardless, we believe there is the potential for human activities associated with the proposed action to disturb pronghorn and, given the precarious nature of the pronghorn population, even limited disturbance of a few individuals may have population level impacts to Sonoran pronghorn.

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 (FWS 1998, Rutman 1997). While grazing activities across the range of the pronghorn have been largely eliminated, it is likely that long term impacts of this past activity are persistent across the species range. In 2004, the U.S. Bureau of Land Management (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 previous 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 ongoing habitat degradation. For instance, all the valleys at CPNWR 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; however, this figure may be grossly underestimated. FWS reported 8,000 miles of off-road impacts in CPNWR as of 2008. Similar levels of impacts are expected to exist at OPCNM, and a report summarizing existing impacts is being produced (electronic mail from Mark Sturm, OPCNM, August 31, 2011); however, we have not yet received this report. OPCNM has mapped thousands of miles of unauthorized of off-road impacts to date. Based on this preliminary estimate, hundreds of miles of unauthorized vehicle routes may exist within the vicinity of the proposed LRMTacCom project and thousands may exist within the action area. A cooperative effort is currently underway by CBP, NPS, and BLM to map and mark roads within the range of the Sonoran pronghorn to indicate those roads that are open for

use by these agencies, and roads that are closed to vehicle traffic. It is hoped that this effort will reduce the use of unauthorized roads and the associated impacts to Sonoran pronghorn.

Prior to the completion of the vehicle border 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). NPS notes that CBV vehicle activity has decreased at OPCNM since about 2004 (electronic mail, Tim Tibbitts, OPCNM, 2009 and 2011); however, the number of off-road tracks, and new roads ("unauthorized vehicle routes") in OPCNM continues to increase (electronic mail, Tim Tibbitts, OPCNM, September 1, 2011). Decreased CBV vehicle traffic in pronghorn habitat as a result of the fences significantly alleviated the adverse effects of illegal (smuggling and migration) vehicle 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. Off-road driving conducted in pronghorn habitat results in significant degradation of this habitat and disturbance to pronghorn as discussed above. Because of concern over the dramatic increase in disturbance since 2005/2006, NPS has collected data over time to document the trend. The proliferation of unauthorized roads is a major impact on multiple resources, and provides an index of the level of human activity currently taking place in pronghorn habitat.

One potential measure of pronghorn habitat degradation is affects to carrying capacity, the number and distribution of pronghorn that can be supported by habitat conditions and access to available forage. Although the carrying capacity of the pronghorn range has not been quantified, loss or modification of habitat is a potential impact on Sonoran pronghorn. Loss or modification of habitat can reduce the ability of the overall U.S. population of Sonoran pronghorn to cope with limitations of forage by moving from place to place. Ultimately, loss or modification of habitat would reduce the carrying capacity of the U.S. range, resulting in a lower population. Based on population estimates from the past 85 years (Table 1), the pronghorn range has never supported more than about 300 individuals. A population of 300 animals may approach or exceed carrying capacity given current conditions on the occupied range (FWS 2002). Prior to alteration of the range beginning in the early 1900's, the carrying capacity was probably higher due to the ability of herds to migrate to perennial water sources during drought (see "Distribution and Abundance" section under "Status of the Species" for Sonoran pronghorn).

However, the concept of carrying capacity is difficult to describe or apply to the Sonoran desert, particularly as it may apply to pronghorn. For example, it may not just be related to quantity (availability), but also quality of forage. Forage may become limiting for Sonoran pronghorn as the quality decreases, rather than from a lack of forage. Even during a prolonged period of drought, forage still occurs on the landscape; however, it is of insufficient quality to sustain pronghorn. How does this affect carrying capacity? In 2002, the remaining 21 pronghorn were slowly starving to

death, but survived after summer rains increased forage quality. The forage plants were present, but were not of sufficient quality for use by pronghorn, until after precipitation events. One could say that the carrying capacity for pronghorn was 21 for the year 2002, but this number of pronghorn was also influenced by other decimating factors (predation, human caused stress). Defining carrying capacity is complex and is likely related to the cumulative influence of all of these factors on pronghorn survival. Factors affecting pronghorn that are not related to forage are likely exacerbated in periods of poor range conditions, and pronghorn are likely more resilient to such threats during periods of good range conditions. Human activities or infrastructure on the landscape can provide impediments, affecting access by pronghorn to forage and water resources. For example, deVos and Miller (2005) found that pronghorn use areas greater than one kilometer from roads preferentially, and used areas within one kilometer of roads less than predicted, even during a period of good range conditions. Regardless of the forage quality, if pronghorn are not able to access the forage, it cannot contribute to survival and recovery of the population. Overall, carrying capacity is a likely a function of timing of rains and the level of rainfall more than any other factor (Horne 2010, email communications from John Hervert, AGFD, October 3, 2012 and Jim Atkinson, CPNWR, October 5, 2012), but Sonoran pronghorn must be able to access forage of adequate quality.

Due to habitat restrictions previously discussed, any further range reduction through habitat degradation would be significant. Examples of actions that may result in loss or modification of habitat include: permanent human developments; building roads, trails, or other areas cleared of vegetation; invasion by non-native plants; modification of plant communities by fire, etc.; or any activity that further limits use of suitable habitat.

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 burned 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. This said, from 2007 to 2010 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 pronghorn 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 °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. However, it will be important to consider other factors, such as predation, during management actions. Bright and Hervert (20050) indicated that periods of drought may force Sonoran pronghorn to use areas of available forage where predators may be more effective. Thus, climate change and drought may also exacerbate the effects of predation on the Sonoran pronghorn population and management actions should be focused in areas where predation is likely to be less successful.

Small Population Size and Random Changes in Demographics

At populations of fewer than 100 pronghorn, 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 21pronghorn in 2002, and 85 in 2010, 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 pronghorn in 2002 and 52 in 2011, the Pinacate sub-population is also well below desired numbers. At 189 (in 2011), the third sub-population (southeast of Highway 8) is also below the desired size to maintain genetic diversity and has experienced a substantial decline since the 2004/2005 estimate of 625 pronghorn. 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). A number of deaths (five in the captive breeding pen and two in the wild) in 2010 are suspected to be related to epizootic hemorrhagic disease and bluetongue virus. 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

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the 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. As described above, the action area for this BO is the action area identified for the project BA (Figure 2).

Status of the Sonoran Pronghorn in the Action Area

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. Because of this, portions of the U.S. range of the Sonoran pronghorn are included in the action area for the proposed action.

Distribution, Abundance, and Life History

The distribution and abundance of the Sonoran pronghorn in the action area is the same as that described above under "Status of the Species" for the U.S. sub-population. Life history, including demographics, chronology of breeding and movements, diet, and other factors are 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 discernible 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 2011, rainfall and Sonoran pronghorn range conditions have varied, but have improved overall when compared to 2002. Current range conditions are well below average precipitation for the calendar year and for the water year (October 1, 2011 – September 30, 2012). The January 2012 long-term (48-months) drought status report (http://www.azwater.gov/azdwr/StatewidePlanning/drought/DroughtStatus2.htm) indicates that southwestern Arizona is experiencing conditions of no drought to severe drought conditions.

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 warm 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 water sources and 10 emergency water sources (seven on CPNWR, one on OPCNM, and two on BMGR-West) have been constructed in recent years throughout the range of the U.S. subpopulation. In March 2009, three temporary, experimental feed and water stations were placed on the South TAC on the BMGR-East and in May 2010, two new temporary water stations were placed on OPCNM. These stations are heavily used by pronghorn during times with poor range conditions brought on by drought.

Four forage enhancement plots within pronghorn habitat, 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, but additional plots planned for installation over the next five years may be reconsidered. 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 the success of these measures, it is critical that human activity be avoided or significantly minimized near the plots and waters.

A semi-captive breeding facility at CPNWR was first stocked with pronghorn in 2004; as of January 2013, it contains 57 animals. As described above, this facility will be used to augment the current U.S. sub-population, and to establish additional herds east of SR 85 at Kofa NWR and BMGR-East. The breeding pen at Kofa NWR was stocked with 12 animals in January 2012, and now contains 22 pronghorn, nine of which were born in the new pen in 2012. 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, AGFD, Marine Corps Air Station (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.

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.

Past and Ongoing Federal Actions in the Action Area

Due to 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

Examples of Federal actions for which consultation has not been completed include:

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

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

3) DHS-CBP Vehicle Fence on CPNWR

4) Remote Video Surveillance System (RVSS) and Integrated Fixed Towers

Federal Actions Addressed in Section 7 Consultations

As part of our comprehensive discussion of all past and present actions affecting pronghorn within the general vicinity of the action area, we describe below all BOs issued to date on actions that may affect the pronghorn. A variety of project types were considered with a range of effects to pronghorn, including 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; and 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; 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 BO 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/southwest/es/arizona/Biological.htm.

The following are consultations, which were generally of a greater scope than the above consultations:

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

2. Marine Corps Air Station-Yuma in the Arizona Portion of the Yuma Training Range Complex

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

4. Western Army National Guard Aviation Training Site Expansion Project

5. BMGR Integrated Natural Resources Management Plan

6. SBI*net* Ajo-1 Tower Project, Ajo Area of Responsibility, USBP Tucson Sector, Arizona

7. Tactical Infrastructure Maintenance and Repair Program (TIMR) – CBP

None of the above consultations was determined to result in jeopardy to the species. However, some level of take was anticipated for a number of these consultations and is considered as we evaluate the effects of the proposed action on the Sonoran pronghorn population in the U.S.

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. For example, deVos and Miller (2005) reported that Sonoran pronghorn used areas greater than one kilometer from a road as expected or greater than expected, while using areas less than one kilometer from a road less than expected. Bright and Hervert (2005) concluded that lack of nutritious forage and water increased Sonoran pronghorn fawn mortality. Therefore, we believe that human activities can contribute to increased fawn mortality if such activities prevent access to nutritious forage and water.

Few studies have addressed human disturbance of pronghorn, but Berger et al. (1983) found that human disturbance reduces the foraging efficiency of pronghorn. Krausman et al. (2001) reported 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. They noted that “once aware of an observer, Sonoran pronghorn are quick to leave the area. One herd was observed 1.5 hours later 18 kilometers north of the initial observation in October 1984. Other pronghorn have run until out of the observer’s sight when disturbed.” Hughes and Smith (1990) noted that on all but one occasion, pronghorn ran from the observer’s vehicle and continued to run until they were out of sight. 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). Frequent disturbance imposes a burden on the energy and nutrient supply of animals (Geist 1971), which may be exacerbated in harsh environments such as those occupied by Sonoran pronghorn. Krausman et al. (2001) also found that fawns and their mothers were more sensitive to human disturbance than other life stages of Sonoran pronghorn.

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 sub-population increased to 85 in 2010. At 85, 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 (Horne 2010, Defenders of Wildlife 1998).

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% of the range, military training on North and South TACs covers 9.8%, active air-to-air firing range covers 5.8%, proposed EOD five-year clearance areas at North and South TACs and Manned Range 1 cover 1.0%, and MCAS-Yuma proposed ground support areas and zones cover 0.29%.

CBV traffic and responding USBP enforcement activities occur throughout the range of the pronghorn, and evidence suggests pronghorn may be 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). 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 (electronic mail, Tim Tibbitts, OPCNM, September 1, 2011). 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 on CPNWR currently holds 57 pronghorn. This facility will provide pronghorn to augment the existing sub-population and to establish the additional populations east of SR 85 at Kofa NWR and BMGR-East. A new semi-captive breeding facility on Kofa NWR currently holds 22 pronghorn (electronic mail communication with John

Hervert, AGFD, October 3, 2012). 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. These include ongoing military training activities that could negatively affect pronghorn, disturbance from livestock grazing on public lands, and land use prescriptions on BMGR, CPNWR, and OPCNM. These same Federal agencies also implement various actions which may benefit the pronghorn. Effects from multiple CBP-related infrastructure projects and activities have been reduced through various conservation measures; 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. In fact, based on population viability analysis, the loss of even a single pronghorn per year could significantly threaten species survival (Hosack et al. 2002).

Changes made in proposed actions and reinitiated biological opinions, plus the findings in other opinions from 2001 to the present, 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. 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.

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 (deVos and Miller 2005). 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 program, plus planned future recovery actions, including establishment of a second U.S. sub-population, provide a path toward the recovery of the Sonoran pronghorn in the U.S. Key to achieving recovery will be a reduction in human disturbance to pronghorn and their habitat (Sonoran Pronghorn Recovery Criteria, Sonoran Pronghorn Recovery Plan Supplement and Amendment, January 2002).

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the proposed action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and, are later in time, but are still reasonably certain to occur.

Before implementation of the proposed action, surveys and site visits for engineering and regulatory compliance may cause some disturbance as a result of travel to and from the sites, as well as survey and planning activities while on-site. These activities would be unlikely to except for implementation of the proposed action. These activities are relatively short in duration and limited in the disturbance they cause and the potential effects minimal. The increased communication abilities resulting from the proposed action could allow for additional CBP patrol routes, encourage new road or infrastructure in areas benefitting from increased security, or increase the number of incidents to which CBP responds. This would potentially affect the patterns and movement of illegal activity, commerce, and residential development. The location and likelihood of these effects are difficult to predict. It is also likely that equipment unrelated to this action could also be mounted on the newly installed radio repeater infrastructure in the future. FWS guidelines (2000) recommend using existing towers whenever possible instead of building new ones, and financial incentives would also provide motivation for installing additional equipment on any infrastructure that is built. The installation, repair, maintenance, and associated disturbances are potentially an interrelated effect of the proposed action. These actions are likely to have reduced adverse effects on listed species because the period of disturbance would be brief, the area of potential effect would be small, and the action would occur in previously disturbed areas.

There are three sites identified where work will occur under the proposed action that are within or have the potential to affect areas within the range of the Sonoran pronghorn. Of these, work associated with the Granite Mountain site is expected to have the greatest potential for effects to pronghorn. The proposed western access routes to the Christmas Pass and Buck Peak sites will essentially avoid impacts to pronghorn and pronghorn habitat. Because of the locations of the proposed sites, it is not anticipated that there will be direct impacts to Sonoran pronghorn habitat. Because construction necessitates the use of helicopters to transport materials and personnel, there is the potential for direct effects to Sonoran pronghorn through disturbance from these overflights, again these effects are primarily associated with the proposed work at the Granite Mountain site. Installation and scheduled maintenance will not occur during the pronghorn fawning season. This will reduce the potential for effects to Sonoran pronghorn during this sensitive period of the year. However, emergency repairs and maintenance may occur at any time of the year, including fawning season. Approximately 30 round-trip flights (i.e., 16 round trips for Buck Peak, 7 round trips for Christmas Pass, 7 round trips for Granite Mountain) would be necessary for installation of equipment at the LRMTacCom locations. However, only the flights to Granite Mountain would

occur within core areas of the Sonoran pronghorn range. Impacts to pronghorn at the Christmas Pass and Buck Peak sites should be minimal if the access flight paths remain from the west. Long-term disturbance will occur from two scheduled maintenance trips to each LRMTacCom location each year. It can be assumed that the LRMTacCom locations would be accessed via helicopter for repairs and maintenance trips and has the potential for disturbance if pronghorn are in the vicinity. Because the Sonoran pronghorn is endangered and the population has failed to increase to a sustainable number in over 40 years, any effects to individual pronghorn have the potential to affect the species as a whole. This includes effects to pronghorn outside the fawning season.

Evaluating noise effects on pronghorn from anthropogenic factors is difficult, and human caused noise is difficult to assess separately from the effect of the visual aspects of the source of those noises. 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. 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. Behavioral responses such as interrupted activity, vigilance, alert distance, flight distance, and displacement have been used to assess reactions of bighorn sheep to disturbance (Papouchis et al. 2001, Jansen et al. 2006). When compared to physiological stress responses, such as increased heart rate, increased serum cortisol levels, and fecal and urinary corticosteriod levels (MacArthur et al. 1979, Miller et al. 1991, MacArthur et al. 1982, Stemp 1983, Harlow et al. 1987, Hayes et al. 1994, and Keay et al. 2006), bighorn sheep have been shown to have a pronounced physiological stress response to disturbance without showing an overt behavioral response (MacArthur et al. 1982, Stemp 1983).

Ground-based activities may result in behavioral or physiological changes that may be detrimental (Geist 1971, Freddy et al. 1986, Workman et al. 1992). 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 and 2004) found that Sonoran pronghorn reacted to human ground-based stimuli (vehicles and foot traffic) with a change in behavior, including occasionally running or trotting away. Wright and deVos (1986) noted that Sonoran pronghorn exhibit “a heightened response to human traffic” as compared to other subspecies of pronghorn.

Relatively favorable rainfall and forage conditions for pronghorn population growth occurred from 2005-2010. Additionally, 82 pronghorn have been released from the semi-captive breeding pen into the wild population as of January 2013. Forage and water have been provided via several artificial water sources and forage enhancement plots. Nonetheless, the population stayed fairly static during this period (58 pronghorn in 2004, 68 in 2006, 68 in 2008, and 85 in 2010). At 85 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 (Horne 2010, Krausman et al. 2005, deVos and Miller 2005). We believe that, based on the identification in the literature of human disturbance as an impact to pronghorn, a significant reduction in disturbance to pronghorn and their habitat is critical to the continued survival and recovery of this species (deVos and Miller 2005, Gavin 2004, Krausman et al. 2004, FWS 2002). With the pen releases, population genetics among the wild herds and resistance to EHD and BTV are likely improving.

Additionally, impacts to pronghorn will be minimized because all project activities, with the exception of the Buck Peak and Christmas Pass sites where access routes avoid pronghorn habitat, will occur outside of the fawning season (fawning season is from March 15 to July 15) within suitable habitat within the range of the species (Sonoran Pronghorn BMP #3). Substantial impacts to fecundity or mortality are not anticipated due to the implementation of project avoidance and minimization BMPs. Noise, human presence, and vehicles associated with maintenance and repair activities may cause short-term disturbance to Sonoran pronghorn.

Due to the lack of specific research into the effects of human disturbance on Sonoran pronghorn and the general lack of published information related to this species, we must rely on the best available information, including work conducted on other species and personal communications with biologists currently working in the field with Sonoran pronghorn. It is our opinion that human activities and disturbance can affect Sonoran pronghorn by causing behavioral and physiological responses that potentially affect survival and productivity. It is difficult to predict the extent of such effects that may occur as a result of the proposed action, particularly when considering the current baseline conditions which include substantial human activity and infrastructure. However, such effects are reasonably certain to occur based on our conversations with biologists in the field, input from the Sonoran Pronghorn Recovery Team, and the published information and grey literature that is available. We believe this is especially true due to the inconsistent occurrence of good range conditions, and the ongoing history of poor range conditions within the range of the Sonoran pronghorn.

<u>Disturbance to Sonoran pronghorn – Direct Effects</u>

Human activity and noise associated with helicopter overflights and maintenance activities may 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. Disturbance associated with proposed action will be periodic and short-term, and BMPs and CMs will be implemented to avoid and minimize adverse effects to Sonoran pronghorn to the extent possible. Per BMP #5, use of helicopters under the proposed action would not occur during the pronghorn fawning season (March 15 to July 15). Human disturbances can be

particularly detrimental during certain critical periods of a pronghorn's life or during the year when animals are in poor condition or more vulnerable to injury. Sonoran pronghorn are particularly susceptible to stress caused by disturbance during the fawning season due to increased energetic demands during this period. Disturbance may result in fawn and adult mortality, particularly during drought years, due to the low availability of forage and water resources and consequent decreased fitness of adults and fawns. Furthermore, as noted above, disturbance during the fawning season may cause fawns to be separated from their mothers which can also result in death. As mentioned above, the proposed action will not occur during the Sonoran pronghorn fawning season within the range and habitat of the species (the western flight approaches for Buck Peak and Christmas Pass essentially avoid areas used by pronghorn). Therefore, we anticipate these activities will not adversely affect pronghorn during this critical period. In the event that emergency maintenance or other unforeseen actions related to the proposed action are needed during the fawning period, CBP will obtain guidance and authorization from FWS and other relevant Federal land managers prior to conducting any maintenance and repair activities at the TacCom sites (see BMP #4).

Due to the extremely low population numbers and endangered status of this species, there is only limited research on the physiological impacts of human activities on Sonoran pronghorn (Workman 1992), and baseline levels of stress for this species are not currently known. Most researchers agree, however, that noise can affect an animal's physiology and behavior, and if it becomes a chronic stress, noise can be injurious to an animal's energy budget, reproductive success and long-term survival (Radle 1998, Kaseloo and Tyson 2004). The potential for project activities to cause physiological stress to pronghorn is expected to be short-term and minor. Pronghorn may be exposed to noise arising from maintenance and repair activities; however, the level of noise at the LRMTacCom sites will be minimal. Impacts associated with noise of helicopter overflights will be reduced through implementation of BMPs #4 and #5. Sonoran pronghorn may be adversely affected by noise and visual impacts of heavy equipment, vehicles, and personnel. Disturbance to pronghorn is anticipated to result from helicopter overflights and maintenance activities, which may result in energetic stress or harm related to decreased access to resources, particularly during drought and other periods of poor range conditions. The direct effects of these activities could include increased behavioral changes or stress in Sonoran pronghorn. Project-related activities may result in short-term visual and auditory disturbance of pronghorn. However, CBP will significantly minimize this disturbance by implementing general and species-specific BMPs. Additionally, as mentioned above, the proposed activities will occur outside of the Sonoran pronghorn fawning season.

Disturbance to Sonoran Pronghorn – Indirect Effects

Potential indirect effects on the Sonoran pronghorn include increased potential for fire and introduction and spread of invasive species. The introduction of exotic species can reduce the quality of pronghorn habitat, potentially affecting pronghorn occurrence and abundance through habitat degradation and altered fire regimes. Indirect impacts through habitat loss and degradation are addressed below. Implementation of BMP #2 will reduce the potential for indirect effects from invasive plant species.

Habitat Loss and Degradation-Direct Effects

The proposed action will not result in any additional Sonoran pronghorn habitat loss or degradation due to the fact that the proposed LRMTacCom sites are located outside of pronghorn habitat. Accessing these sites through Sonoran pronghorn habitat will be necessary, but will primarily be by helicopter or on foot or horseback. Therefore, we do not anticipate any adverse effects to Sonoran pronghorn habitat as a result of access methods. In addition, any impacts to vegetation and soils related to the proposed action will be minimized through implementation of BMPs (see BMP #1).

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 perimeter of maintained roads and infrastructure, and continuously created disturbed ground are susceptible to colonization by invasive non-native plants such as buffelgrass, Sahara mustard (*Brassica tournefortii*), and rocketsalad (*Eruca vesicaria*). Non-native species could spread to other areas and may outcompete native species upon which pronghorn rely, or carry fire which could impact pronghorn habitat. The colonization and spread of non-native plants will be minimized by the implementation of a number of measures (see BMPs #1 and #2). Consequently, we believe effects from the proposed action related to invasive species and fire to be unlikely to occur.

Limited erosion is expected during and immediately following construction activities. However, erosion and changes to natural hydrology will be minimized through implementing standard construction procedures to minimize potential for erosion and sedimentation (BMP #1).

Effects of Best Management Practices

BMPs incorporated into the proposed action, such as those mentioned above, will significantly help minimize project impacts to Sonoran pronghorn and their habitat. For example, avoiding helicopter overflights during the pronghorn fawning season will avoid potential disturbance impacts during the most sensitive period of the year. Ongoing coordination with CPNWR and CNF, as well as AGFD, will provide opportunities to evaluate and reduce potential effects of the proposed action on Sonoran pronghorn related to long-term maintenance and repair of the sites.

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 BO. 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 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 SR 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. Although CBV activity levels are still high, the trend in overall CBV apprehensions and drive-throughs is a decline in recent years likely due to increased law enforcement presence, the border fence, and the status of the economy in the U.S. 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 appears to have declined.

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. Anticipated incidental take has increased recently, and 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. 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 a path toward the recovery of the Sonoran pronghorn in the U.S. At the same time, the rate of recruitment in the wild population in the U.S. is not self sustaining. Population gains are being achieved through augmentation from the semi-captive breeding pen. This indicates that for a number of reasons, including persistent physiological stress of individuals, low recruitment levels persist in the wild U.S. Sonoran pronghorn population.

CONCLUSION

The conclusions of this BO are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any BMPs that are incorporated into the project design. After reviewing the current status of the Sonoran pronghorn, the environmental baseline for the action area, the effects of the proposed activities, and cumulative effects, it is FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Sonoran pronghorn. Pursuant to 50 CFR 402.02, to "jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. No critical habitat has been designated for this species; therefore, none will be affected. Our conclusion is based on our discussion in this document found in the "Effects of the Action" section above, and the following:

1) The proposed action will not directly affect Sonoran pronghorn habitat, and measures have been included to reduce direct and indirect effects to vegetation and soils.

2) Although we anticipate that activities associated with the proposed action may result in disturbance to pronghorn, the proposed BMPs will reduce the potential for adverse effects to the Sonoran pronghorn.

3) CBP has committed to ongoing coordination with the Federal land managers regarding the long-term implementation of the proposed action. This will provide the opportunity to practice adaptive management and rely on the most up-to-date information to direct the ongoing maintenance and repair of these sites in a way that reduces potential effects to Sonoran pronghorn. Thus, the LRMTacCom project is not expected to significantly affect the distribution, numbers, and reproduction of Sonoran pronghorn in the wild.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act 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 Act 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 do not anticipate that the proposed action will result in incidental take of Sonoran pronghorn. Our conclusion is based on the rationale in the “Effects of the Action” and “Conclusion” sections above. Specifically, we do not anticipate incidental take for the following reasons:

1. The proposed LRMTacCom sites are located in areas that do not support Sonoran pronghorn habitat and impacts to vegetation and soils at the LRMTacCom sites will be minimized.
2. The access routes proposed for helicopter flights during construction and maintenance at Christmas Pass and Buck Peak will generally avoid Sonoran pronghorn habitat and effects to pronghorn.
3. With exceptions for emergency maintenance and repair and the activities at Buck Peak and Christmas Pass using a western flight approach (see description above) , all activities associated with the LRMTacCom will occur outside of the fawning season for Sonoran pronghorn.
4. CBP will use the most current information regarding Sonoran pronghorn locations from CPNWR and AGFD to implement the proposed action in a way that minimizes effects to Sonoran pronghorn.
5. There will be ongoing coordination between CPNWR and CBP over the life of the proposed action to minimize effects to Sonoran pronghorn.

CONSERVATION RECOMMENDATIONS

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

1. We recommend CBP continue to pursue funding for Sonoran pronghorn research and conservation needs identified by the Sonoran Pronghorn Recovery Team.

2. We recommend CBP hire and maintain at least one full-time biologist or environmental specialist for both the Tucson and Yuma Sectors to assist CBP 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 the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

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 (USFWS OLE, Resident Agent In Charge, 4901 Paseo del Norte NE, Suite D, Albuquerque, New Mexico 87113; telephone: (505) 248-7889) 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.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the 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.

For further information, please contact Scott Richardson at (520) 670-6150 (x242) or Jean Calhoun (x223) of our Tucson Suboffice. Please refer to the consultation number, 02EAAZOO-2012-F-0170 in future correspondence concerning this project.

Sincerely,

/ s / Jean Calhoun for
Steven L. Spangle
Field Supervisor

cc (hard copy):

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Table 1. Summary of Population Estimates for Sonoran Pronghorn in the U.S.

Date	Population estimate	Source
1925	105[a]	Nelson 1925
1941[b]	60[a]	Nicol 1941
1957	<100[a]	Halloran 1957
1968	50[a]	Monson 1968
1968-1974	20-150[a]	Carr 1974
1981	100-150[a]	Arizona Game and Fish Department 1981
1984	85-100[a]	Arizona Game and Fish Department 1986
1992	179 (145-234)[a]	Bright *et al*. 1999
1994	282 (205-489)[a]	Bright *et al*. 1999
1996	130 (114-154)[a]	Bright *et al*. 1999
1998	142 (125-167)[a]	Bright *et al*. 1999
2000	99 (69-392)[a]	Bright *et al*. 1999
2002	21 (18-33)[a]	Bright and Hervert 2003
2004	58 (40-175)[a]	Bright and Hervert 2005
2006	68 (52-116)[a]	Unpublished data
2008	68	Unpublished data
2010	85[c]	Unpublished data
2013	159	Unpublished data

[a]95% Confidence interval. There is a 5% chance that the population total falls outside this range.
[b]Population estimate for southwestern Arizona, excluding Organ Pipe National Monument.
[c]Does not include 17 pronghorn released from breeding pen in December 2010.

Table 2. Comparison of U.S. Sonoran Pronghorn Population Surveys

	Pronghorn Observed		Population Estimates			
Date	On transect	Total observed	Density estimate using DISTANCE[a]	Lincoln-Peterson[a]	Sightability model[a]	Other estimate
Dec 1992	99	121	246 (103-584)	---	179 (145-234)	---
Mar 1994	100	109	184 (100-334)	---	282 (205-489)	---
Dec 1996	71	82 (95[b])	216 (82-579)	162 (4-324)	130 (114-154)	---
Dec 1998	74	86 (98[b])	---	172 (23-321)	142 (125-167)	---
Dec 2000	67	69[b]	N/A	N/A	99 (69-392)	---
Dec 2002	18	18	N/A	N/A	21 (18-33)[c]	---
Dec 2004	39	51	N/A	N/A	58	---
Dec 2006	51	59	N/A	N/A	68 (52-116)	---
Dec 2008	N/A	N/A	N/A	N/A	N/A	68[d]
Dec 2010	N/A	N/A	N/A	N/A	85	---

[a] 95% Confidence interval. There is a 5% chance that the population total falls outside 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 3. Comparison of Mexico Sonoran Pronghorn Surveys, 2000-2011.

	Pronghorn Observed			Population Estimate		
Date	West of Hwy 8	Southeast of Hwy 8	Total	West of Hwy 8	Southeast of Hwy 8	Total
Dec 2000	--	--	--	--	--	346
Dec 2002	--	--	214	25	255	280
Dec 2004/Feb 2005	30	439	469	59	625	684
Jan 2006	--	--	486	--	--	634
Dec 2007	35	325	360	50	354	404
Dec 2009	53	258	311	101	381	482
Dec 2011	30	167	197	52	189	241

Table 4. CBV Apprehensions by Location

Location	1999	2006	FY2009	FY2010	FY2011	FY2012*
Ajo Station AOR	21,300	22,504	15,456	20,448	17,385	--
Wellton Station AOR	--	--	1,889	1,758	1,678	--
OPCNM and CPNWR	--	--	N/A	3,265	7,282	5,187

*Data as of August 30, 2012

APPENDIX A. Concurrences

Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*)

Environmental Baseline

The lesser long-nosed bat is a yellow-brown or cinnamon gray bat, with a total head and body measurement of approximately 8 cm (3 inches). The tongue measures approximately the same length as the body. This species also has a small nose leaf (FWS 2001). Lesser long-nosed bat was listed as federally endangered without critical habitat on September 30, 1988 (53 FR 38456). The species historically ranged from southern Arizona in the Picacho Mountains, the Agua Dulce Mountains, and the Chiricahua Mountains to southwestern New Mexico in the Animas and Peloncillo Mountains through much of Baja California, Mexico (FWS 1994). These bats are seasonal (April to September) residents of southeastern Arizona, and possibly extreme western Arizona (i.e., Cochise, Pima, Santa Cruz, Graham, Pinal and Maricopa Counties, Arizona) (FWS 2001, 2007). With regard to the action area for the proposed action, three major maternity roosts in Arizona (Bluebird and Copper Mountain Mines and Growler Mountain roost) are located within 36 miles of the proposed Granite Mountain LMRTacCom location, and one day roost is located near the proposed Cobre LMRTacCom location and helicopter access route. Habitat for the species includes mainly desert scrub habitat in the U.S. portion of its range. In Mexico, the species occurs up into high elevation pine-oak and ponderosa pine forests. Within the United States, this species forages at night on nectar, pollen from columnar cacti (such as saguaro and organ pipe cacti), and agaves with branched flower clusters (FWS 2001). Considerable evidence exists for the interdependence of *Leptonycteris* bat species and certain agaves and cacti (FWS 2001). During daylight, lesser long-nosed bats roost in caves or abandoned mines. Impacts to foraging resources have been identified as a threat to this species. Impacts to forage resources, including the conversion of habitat for agricultural uses, livestock grazing, woodcutting, urbanization, other development might contribute to the decline of long-nosed bat populations. In addition, occupancy of communal roost sites by illegal border crossers and recreational users is a potential threat. These bats are particularly vulnerable due to many individuals using only a small number of communal roosts (FWS 2001). In general, the trend in overall number of lesser long-nosed bats has been stable or increasing in both the United States and Mexico. In part, for this reason, the FWS recommended reclassifying the status of this species as threatened (FWS 2007).

Effects of the Proposed Action

There are a number of potential effects to the lesser long-nosed bat from the proposed action. However, installation and maintenance and repair activities would occur infrequently, and CBP has included a number of BMPs and other measures to reduce the potential for these effects.

The potential direct impacts on lesser long-nosed bat include disruption of normal roosting and foraging behavior due to noise and lighting associated with installation, maintenance, and repair activities. However, the proposed action includes a BMP that indicates no work will occur between May 1 and September 30 (see page 4-4 of the BA), the normal period of time when lesser long-nosed bats occupy roosts in proximity to the action area. Maintenance activities that occur at night have the potential to interfere with a bat's ability to locate and find food (Schaub et al. 2008), and bats might avoid areas where maintenance noise is present. Installation and maintenance activities at night, and any associated lighting, have the potential to impact bat behavior, altering commuting routes to foraging habitat (Stone et al. 2009). However, the proposed action does not include any work at night. Considerable evidence exists for the interdependence of *Leptonycteris* bat species and certain agaves and cacti (FWS 2001). Site surveys report the potential loss of less than 24 individual agave plants at the Buck Peak site. Vegetation removal at installation sites will be limited to the least practical disturbance. Impacts from habitat disturbance on lesser long-nosed bat would be negligible (less than 0.1 acre).

Bats may avoid foraging areas in the vicinity of LRMTacCom equipment because of the electromagnetic field (EMF) produced. EMFs can also cause increases in bat's surface and deep body temperatures after prolonged exposures. Bats are particularly susceptible to EMF strengths of 2 volts/m (Nicholls and Racey 2007). It is currently unclear whether there would be any impact from the LRMTacCom equipment; however, the proposed equipment is not different from other radio repeater sites currently in use within the action area and the range of the lesser long-nosed bat.

Conclusion

The Service concurs with the CBP determination that the proposed action may affect, but is not likely to adversely affect the lesser long-nosed bat based upon the following:

- Installation, maintenance and repair activities will occur infrequently and will not occur in proximity to any known lesser long-nosed bat roost locations.
- No fencing, guy wires or lighting will be installed at the proposed sites. This will reduce the potential for effects such as collisions or avoidance of the area to an insignificant level.
- Vegetation disturbance and loss of lesser long-nosed bat forage plants is minimal and will have an insignificant effect on forage availability.

Mexican spotted owl (*Strix occidentalis lucida*)

Environmental Baseline

The Mexican spotted owl has large, dark eyes, an overall dark to chestnut brown coloring, whitish spots on the head and neck, and white mottling on the abdomen and breast (FWS 1995). Mexican spotted owl was listed as federally-threatened on March 16, 1993 (58 FR 14248), with critical habitat designated on August 31, 2004 (69 FR 53182). Critical habitat for Mexican spotted owl

occurs in the action area for the proposed project. The Mexican spotted owl inhabits canyon and forest habitats across its range and is frequently associated with mature mixed-conifer, pine-oak, and riparian forests. Owls are usually found in areas with some type of water source such as perennial streams, creeks, and springs. Mexican spotted owls use a variety of habitats for foraging, including multi-layered forests with many potential patches. In areas within Arizona and New Mexico, forests used for roosting and nesting often contain mature or old-growth stands with complex structure. The breeding period for Mexican spotted owls is March through June (FWS 1995). The primary threats to the Mexican spotted owl are even-aged timber harvest and the threat of catastrophic wildfire. Additional threats include development from oil, gas, and mining; and recreation (FWS 1995). The Cobre LRMTacCom site is within 4 miles of Mexican spotted owl critical habitat and 7 miles of the nearest protected activity center (PAC); however, flight paths from the Nogales International Airport to the site may fly directly over critical habitat and PACs.

Effects of the Proposed Action

There are a number of potential effects to Mexican spotted owls from the proposed action. However, installation, maintenance, and repair activities would occur infrequently, and CBP has included a number of BMPs and other measures to reduce the potential for these effects.

Potential direct impacts to Mexican spotted owl include the risk of disturbance from helicopter overflights from installation, maintenance, and repair activities, and habitat degradation from vegetation removal. Avian species are particularly susceptible to adverse affects during the breeding and nesting season. Removal of vegetation could affect Mexican spotted owls by reducing suitability of habitat if enough vegetation is removed that it fragments the habitat and alters its structure. Vegetation removal will be minimized under the proposed action (see BMP #1 and #6). This limited vegetation control will be conducted outside of the Mexican spotted owl nesting season (see BMP #5).

Noise and visual disturbance associated with installation, maintenance and repair activities could disrupt breeding and foraging behaviors of the Mexican spotted owl. For example, such disturbances could cause adult Mexican spotted owls to flush from roosts or nests. However, BMPs will be implemented so that activities will not typically occur within the nesting season and flight paths and altitudes will be adjusted to avoid or minimize disturbance at PACs and over critical habitat (see BMPs #4 and #5). Emergency maintenance/repair trips could occur at any time of the year; however, flight paths could be established to reduce or eliminate the potential for impacts on Mexican spotted owls and their critical habitat. By implementing these BMPs, the potential for direct and indirect effects from the proposed action will be minimal and discountable, and any effects that might occur would be insignificant.

Conclusion

The Service concurs with the CBP determination that the proposed action may affect, but is not likely to adversely affect the Mexican spotted owl, based upon the following:

- Installation, maintenance, and repair activities will occur infrequently and the Cobre LRMTacCom site is located outside of any known PACs or critical habitat.
- No activities under the proposed action will be conducted during the Mexican spotted owl nesting season (see BMP #5).
- In Mexican spotted owl habitat, habitat disturbance will be minimized by restricting vegetation removal to the immediate vicinity of the LRMTacCom site. Any vegetation removal will be minimized (BMP #1). If vegetation must be removed, natural regeneration of native plants will be promoted by cutting vegetation only with hand tools, mowing, trimming, or using other removal methods that allow root systems to remain intact (see BMP #1 and #6). This should reduce vegetation impacts within Mexican spotted owl habitat to an insignificant level.

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Figure 1-1: Vicinity Map for LMR TacCom Arizona Focus Area

GSRC

September 2011

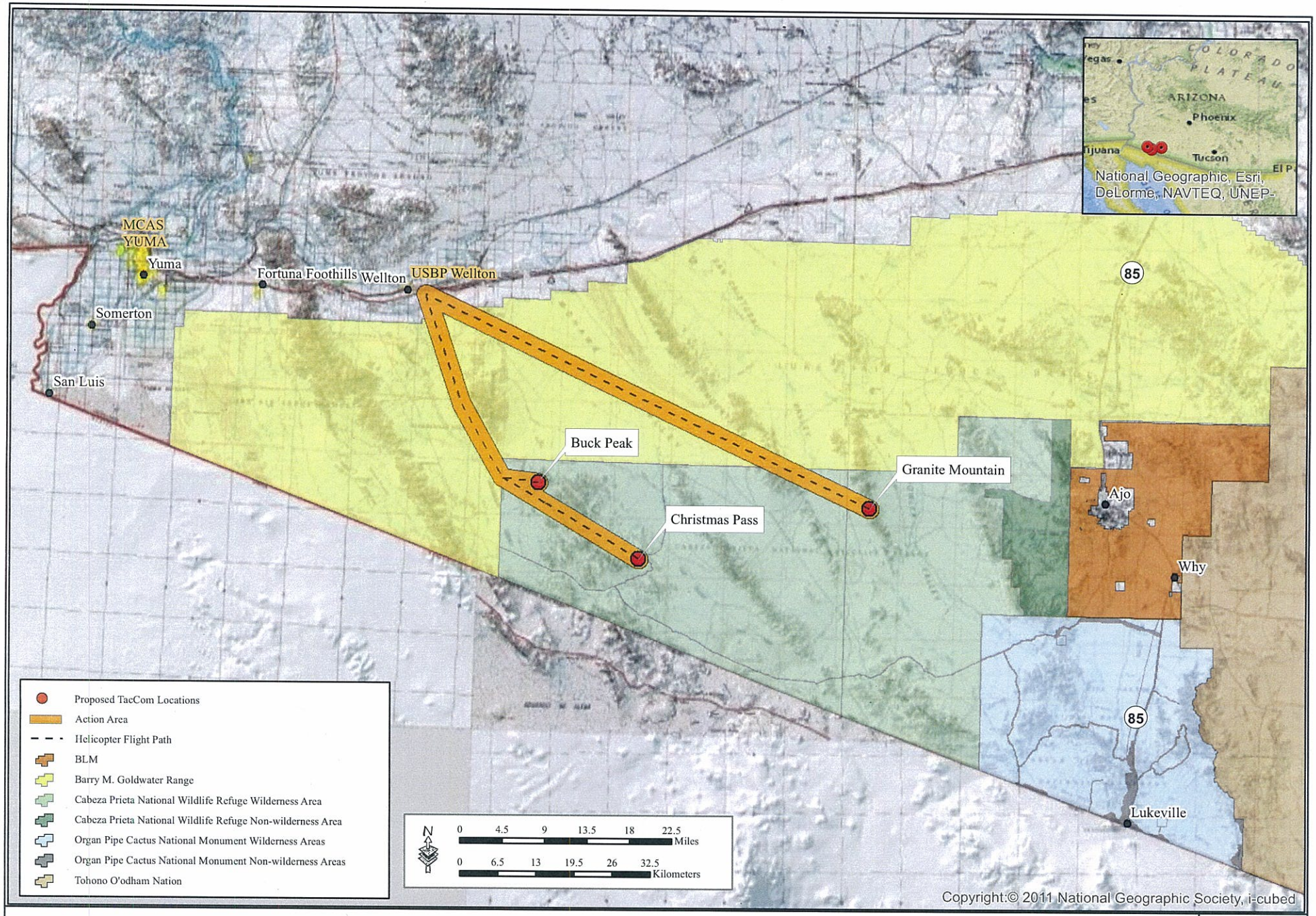

Figure 1-2. Action Area for LMR TacCom Arizona Focus Area

GSRC

April 2013