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In Reply Refer To:  
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2-21-93-F-389R2

August 6, 2003

Captain William P. Fay  
Environmental Program Manager  
Arizona Army National Guard  
5636 E. McDowell Road  
Phoenix, Arizona 85006

Dear Captain Fay:

This document transmits our biological opinion based on our review of the Western Army National Guard Aviation Training Site (WAATS) expansion project located in Maricopa, Pima, and Pinal counties, Arizona, and its effects on the Sonoran pronghorn (*Antilocapra americana sonoriensis*) in accordance with section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended (ESA). This revised biological opinion is provided in response to a Memorandum Opinion and Order dated January 7, 2003, from Judge Ellen Huvelle of the United States District Court (Court) for the District of Columbia in the case of *Defenders of Wildlife, et al., v. Bruce Babbitt, et al.* (Civil Action No. 99-927 [ESH]).

This biological opinion is based on information provided during the previous consultations on this action, updated information on the proposed action provided by your agency, new information on the status of pronghorn, telephone conversations, field investigations, and other sources of information as detailed in the consultation history. A complete administrative record of this consultation is on file at our office in Phoenix, Arizona. We encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

The September 19, 1997, biological opinion issued for the WAATS included an analysis of the effects of the action on the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), American peregrine falcon (*Falco peregrinus anatum*), and endangered cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*; pygmy-owl). The Sonoran pronghorn was not addressed in the opinion, because the proposed action did not include activities within the current range of the pronghorn. The peregrine falcon is no longer listed pursuant to the ESA and therefore no longer requires section 7 consultation. The current opinion

and the first reinitiation, dated November 16, 2001, do not reevaluate the pygmy-owl and bat because the Arizona Army National Guard (ARNG) continues to implement the September 19, 1997, biological opinion as it relates to those species. The analyses and conclusions for the lesser long-nosed bat and pygmy-owl from the September 19, 1997, opinion are included here by reference.

### CONSULTATION HISTORY

Only key actions in the consultation history are included here for the period prior to issuance of the first reinitiation of this opinion (November 16, 2001). Please refer to the November 16, 2001, and September 19, 1997, opinions for a complete history of the consultation prior to November 16, 2001.

☛ September 19, 1997. We issued a biological opinion for WAATS. The opinion found that the proposed action was not likely to jeopardize the continued existence of the lesser long-nosed bat, American peregrine falcon, and cactus ferruginous pygmy-owl. The opinion anticipated incidental take of the lesser long-nosed bat and pygmy-owl. Two reasonable and prudent measures and three terms and conditions were provided for the bat and two reasonable and prudent measures and six terms and conditions were provided for the pygmy-owl to minimize incidental take.

☛ February 12, 2001. In *Defenders of Wildlife, et al. v. Bruce Babbitt, et al.* the court remanded five biological opinions, including this one, Organ Pipe Cactus National Monument's (NM) General Management Plan, grazing on 5 BLM livestock allotments near Ajo, the Arizona portion of the Yuma Training Range Complex (MCAS-Yuma), and military training on the BMGR authorized by Luke Air Force Base. The Judge's order also required preparation of supplemental environmental Impact Statements (EISs) for the Yuma Training Range Complex and Organ Pipe Cactus NM's General Management Plan, and, in regard to the Sonoran pronghorn recovery plan, required the Service to develop objective, measurable recovery criteria and schedules for implementing recovery actions.

☛ November 16, 2001. A remanded biological opinion for WAATS was issued from our Regional Office in Albuquerque, New Mexico. The opinion found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn. We did not anticipate that the proposed action would result in incidental take of Sonoran pronghorn. The opinion referred the reader to the September 19, 1997, for conclusions on the bat and pygmy-owl.

☛ November 23, 2001. A Record of Decision for the Yuma Training Range Complex's supplemental EIS was published in the Federal Register.

☛ April 11, 2002. A Record of Decision for Organ Pipe Cactus NM's supplemental EIS, re-analyzing cumulative impacts to the Sonoran pronghorn, as directed by court order, was published in the Federal Register.

☛ September 30, 2002. A revised biological opinion was signed for BLM's proposed livestock grazing on 5 allotments near Ajo.

☛ November 27, 2002. A Federal Register notice was published in which critical habitat was proposed for the pygmy-owl. Included was critical habitat proposed at Organ Pipe Cactus NM, on BLM lands north of Organ Pipe Cactus NM, and lands on Cabeza Prieta National Wildlife Refuge (NWR). No lands within the BMGR were proposed for critical habitat.

☛ January 7, 2003. Judge Ellen Huvelle remanded back to us the November 16, 2001, biological opinion for Organ Pipe Cactus NM's General Management Plan. Judge Huvelle gave us 90 days to produce a biological opinion that was consistent with her previous order of February 12, 2001.

☛ February 6, 2003. Judge Ellen Huvelle entered a stipulation among the parties to have us revise the MCAS-Yuma YTRC, Luke Air Force Base, and WAATS November 16, 2001, biological opinions consistent with her January 7, 2003, order within 180 days.

☛ February 27, 2003. We met with ARNG and Luke Air Force Base to discuss the remanded opinion, the status of the pronghorn, and recommended conservation measures.

☛ March 7, 2003. We sent a letter to ARNG listing several emergency recovery actions for the pronghorn that we recommended ARNG and other DoD entities adopt as conservation measures, which would become part of their proposed action.

☛ April 7, 2003. In compliance with Judge Huvelle's January 7, 2003, order, a revised biological opinion was signed and delivered to Organ Pipe Cactus NM covering their General Management Plan. The opinion found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn and the pygmy-owl, and was not likely to result in destruction or adverse modification of critical habitat proposed for the pygmy-owl. The opinion refers the reader to previous opinions for conclusions on the lesser long-nosed bat (which found that the proposed action was not likely to jeopardize the continued existence of the bat). No incidental take of listed animals was anticipated.

☛ June 19, 2003. A letter to this office was dated and received from ARNG outlining the history of consultation on WAATS, the mission of ARNG on the BMGR, details of the WAATS proposed action, and revision of the conservation measures for the pronghorn, in accordance with discussions at the February 27, 2003, meeting and our March 7, 2003, letter to ARNG (Arizona Army National Guard 2003).

☛ July 17, 2003. A revised draft biological opinion for the WAATS expansion project was delivered to ARNG. We requested comments from ARNG by July 28, 2003.

☛ July 29, 2003. We received a letter from ARNG commenting on the draft opinion.



## **BIOLOGICAL OPINION**

### **DESCRIPTION OF PROPOSED ACTION**

The purpose of the WAATS is to provide a highly specialized environment to train military personnel in directed individual aviator qualification training in attack helicopters. The WAATS is located at the Silver Bell Army Heliport adjacent to the north end of the Pinal County Air Park near Marana, Arizona. The WAATS expansion project includes: 1) expansion of the existing Tactical Flight Training Area (TFTA), which includes establishing four Level III touchdown sites, 2) development of the Master Construction Plan (MCP) at the Silver Bell Army Heliport (SBAH), and 3) establishment of a helicopter aerial gunnery range for use by the ARNG on the existing East Tactical Range (TAC) on the Barry M. Goldwater Range (BMGR). In addition, ARNG has agreed to assist in pronghorn recovery efforts. The life of the proposed action considered in this consultation is open-ended. Consultation would be reinitiated as new information becomes available, new species or critical habitat are listed, or other reinitiation criteria are triggered (50 CFR 402.16).

#### **TFTA (including the Level III sites)**

The TFTA covers approximately 2.5 million acres in southern Arizona, extending into Pinal and Pima counties. The TFTA is needed for training individual aircraft crews and unit sustainment operations. Training includes techniques for takeoffs and landings in unimproved areas, terrain flight navigation, and flight techniques (modes of flight). Within the TFTA, three modes of flight are typically used during training: low-level, contour, and nap-of-the-earth. About 75 percent of the tactical training is conducted below 500 feet above ground level (AGL), with the remaining flights typically occurring between 500 and 1,200 feet AGL. These flight modes are used to mask the helicopters from detection by an opposing force.

Within the TFTA, ARNG use has increased from 12,500 to 20,000 sorties per year. According to the ARNG, this level of operation is 15 percent higher than the level of activity conducted in the TFTA prior to the expansion of the WAATS. The distribution of flight operations within the TFTA is likely the distribution shown in Figure 3.5-2 of the draft EIS.

Within the TFTA, some training flights include landing the aircraft in the field. The types of landing sites are divided into three categories (Levels I, II, and III), depending on the type of ground and aircraft activity conducted. All three levels of activities are performed by aviators training at the WAATS. No clearing or improvements are made at Level I sites. In addition, no vehicles or ground personnel operations occur with the exception of aircraft crew members' seat

changes. Level II sites may require limited vegetation clearing to provide sufficient clearance for safe aircraft operations. Limited ground operations would occur. Access would be by aircraft only; no ground vehicle use is authorized.

Level III sites involve extensive use by aircraft and ground personnel. Level III training is proposed within the TFTA at four sites (Picacho Stagefield Annex, Silver Bell Annex, Samaniego Hills, Mercer Ranch) shown in Figure 4.5-1 of ARNG's February 1996 draft EIS for the WAATS Expansion Project. These areas may require some vegetation clearing to provide sufficient clearance for safe aircraft operations. Ground use operations involve activities such as overnight bivouacs, refueling operations, tactical command post, tactical airfield lighting, insertion and extraction of small security teams, and ground vehicles along existing roads or previously used vehicle areas. At the Level III sites, no permanent structures or facilities are constructed. Each site will be graded to establish reusable areas for helicopter/vehicle parking and placement of facilities to support the field operations (e.g., camping areas, headquarters).

### **Master Construction Plan**

The Master Construction Plan involves the existing SBAH property. The property is located at the north end of the Pinal County Air Park on 162 acres. The site is approximately 29 miles northwest of Tucson and 79 miles southeast of Phoenix. The growth at the SBAH site is related to increased training demands for both current and future missions at the WAATS. The primary goals for construction are the modernization of equipment for the 1st Battalion, 285th Aviation (1-285th) division to handle the deployment of the Apache helicopter; meeting the increased demand for training at the WAATS, including the addition of unit sustainment training and Apache helicopter training; and meeting training requirements needed for modernization of aviation units nationwide. The expansion is underway and involves approximately 36 acres.

### **Helicopter Aerial Gunnery Range on East TAC**

#### Operations

Helicopters used in gunnery practice are shuttled to the Gila Bend Air Force Auxiliary Field (on the BMGR approximately three miles south of Gila Bend) for refueling and the loading of weapons/munitions. Students take turns flying from Gila Bend Air Force Auxiliary Field to East TAC for gunnery practice. The weapons storage area at Gila Bend Air Force Auxiliary Field is being expanded by about 2,000 square feet. A bivouac site to be used for unit sustainment training is being developed at the Gila Bend Air Force Auxiliary Field. Under the full training mission expansion concept (maximum use for both individual pilot and unit sustainment training), two groups of helicopters may be active on the range from 4 to 8 hours a day with training expected to occur about 300 days each year. Of the total range training time planned, approximately 20 percent of the training will occur at night. From 1990 to 1999, number of sorties (a sortie is a flight by a single helicopter) into East TAC averaged 476 per year (range 271-679; Table 1). This represented 6.4 percent of all sorties into East TAC for those years.

Number of sorties into East TAC declined to 139, 24, and 16 in 2000, 2001, and 2002, respectively (Table 2). This reduction is a result of deactivation of the AH-1 Cobra attack helicopter system in fiscal year 2001. The Cobra has been replaced by the AH-64 Apache attack helicopter. Use of the BMGR will increase to levels described in ARNG's 1996 biological assessment and their 1997 final EIS as new equipment is fielded and proficiency is obtained (ARNG 2003); however, number of sorties and percentage of all sorties into East TAC by ARNG are projected to remain low until 2010 (Table 2). All weapon types shown on Figure 3.4-2 of the draft EIS can be used on the East TAC.

When East TAC is closed for five weeks each year for explosive ordnance disposal (EOD), the ARNG uses North and South TACs for their training activities. If range time can be scheduled with the Air Force, North and South TACs may also be used at other times. EOD cleanup on East TAC and subsequent use of North or South TACs by the ARNG occurs in March/April. In fiscal year 1999, ARNG conducted 59 sorties on North and South TACs. The Luke Air Force base draft legislative EIS projected that 30 percent of ARNG sorties into the BMGR would occur into North and South TACs (Table 2). In some years (e.g. 2003 and 2004) no sorties would occur outside of East TAC. The ARNG training activities on North and South TACs occur only in previously scheduled Luke Air Force Base training slots that are vacant (i.e., Luke Air Force Base has decided not to use the scheduled training time).

When North or South TACs are used by ARNG, use must comply with Air Force Instruction (AFI) 13-212 V1 Luke Supplement 1 (Attachment 1). This AFI provides detailed use regulations for airspace, ranges, and other facilities within BMGR-East (eastern half of the BMGR managed by Luke Air Force Base). Compliance with these regulations is mandatory for all BMGR-East users. In accordance with the AFI, pronghorn monitoring will be conducted during any high explosive ordnance delivery. The instructions require at least two monitors per TAC during daylight hours. The ranges are monitored visually and by telemetry (for animals with transmitters -note, no pronghorn are currently telemetered) daily for two hours before delivery begins. If there is a break in delivery of more than 2 hours, additional monitoring occurs. If a pronghorn is sighted, no strafing or high explosive ordnance deliveries are made within 1.2 - 3.1 miles of the pronghorn. No monitors are present at night, but deliveries are only allowed if there is not more than a two hour gap between deliveries (during which pronghorn may move onto targets), and afternoon monitoring cannot be completed prior to 30 minutes after sunset or the end of civil twilight (½ hour after official sunset), whichever is earlier.

#### *Weapons/Munitions to be Used in Training*

East TAC is within an existing restricted airspace (Restricted Airspace R-2304) that has sufficient vertical height to allow the firing of all of the weapon types illustrated in Figure 3.4-2 of the WAATS draft EIS (bullets, rockets, and missiles). Nonexplosive ammunition of any weapon type can be used on any of the target areas shown on Figure 4.5-12, 4.5-13, and 5.7-12 of the draft EIS. Missiles carrying high explosives are only fired at the target designated as "HE Hill" on Figure 4.5-11 of the draft EIS. HE Hill has been used historically by the Air Force,

Marines, WAATS, and other military users as a target for weapons carrying high explosives. The ARNG does not use chaff (small fibers that reflect radar signals and temporarily hide aircraft from radar detection) during training on East, South, or North TAC.

### Target and Scoring Systems

East TAC has a series of existing Target Effect Areas (TEAs) used by the WAATS for gunnery practice. No new TEAs will be developed on the East TAC. At each target area, existing targets may be supplemented with non-moving hard targets, such as old armored vehicle chassis. Previously, four towers were proposed for construction on East TAC for a new scoring system using remotely operated cameras mounted on towers. Luke Air Force Base has erected new towers, but ARNG will continue to use the older existing towers.

### **Proposed Conservation Measures**

ARNG proposes the following conservation measures as part of their proposed action:

1. ARNG, subject to funding, will conduct noise studies on non-listed pronghorn located on Camp Navajo, Arizona. This office, Arizona Game and Fish Department, and Cabeza Prieta NWR will review and comment on the draft scope of work for this research project. Non-listed pronghorn subspecies will act as a surrogate for the listed Sonoran pronghorn. Because Camp Navajo is owned and operated by ARNG, funding for this project may be accomplished pursuant to the ordinary funding process for natural resources management projects. For this reason, ARNG is not subject to certain fiscal law constraints that exist at BMGR. The primary focus of the study will be to analyze noise impacts from the following three modes of helicopter flight, which occur on BMGR, primarily on East TAC:

- a. Low-level, contour, and nap of the earth. This type of tactical training can be conducted below 500 feet or between 500 and 1,200 feet AGL.
- b. While on target, helicopters might hold in a hovering position, simulating target acquisition.
- c. Night mission impacts, because approximately 20 percent of training at BMGR will occur at night.

2. Based on data from Table 2, ARNG use of the BMGR is less than five percent of the total sorties off of East TAC. ARNG proposes to use its authorities to make a good faith effort to support up to 5 percent of the total project(s) annual costs for emergency action recovery efforts on the BMGR (see our March 7, 2003, letter to ARNG). The Fish and Wildlife Service would use these funds at their discretion to help in the recovery efforts on the BMGR. This 5 percent level is above the 3.2 percent use that ARNG might have on the BMGR if total estimated sorties



were ever reached (Table 2). Furthermore, this 5 percent projected use is well above the current use of less than one percent by ARNG off of East TAC and only one to two percent of the total sorties throughout the BMGR (Table 2).

## **STATUS OF THE SPECIES**

### **Sonoran Pronghorn**

#### **A. Description, Legal Status, and Recovery Planning**

The Sonoran subspecies of pronghorn (*Antilocapra americana sonoriensis*) was first described by Goldman (1945) from a type specimen taken near the Costa Rica Ranch, Sonora, Mexico by Vernon Bailey and Frederic Winthrop on December 11, 1932, and is currently recognized as one of five subspecies of pronghorn (Nowak and Paradiso 1983). Recent molecular genetic analysis of the Sonoran pronghorn and other subspecies of the American pronghorn did not provide a clear genetic basis for designation of the Sonoran pronghorn as a distinct subspecies (Rhodes *et al.* 2003). However, the analysis showed a clear genetic differentiation of the Sonoran pronghorn from pronghorn populations in central and eastern Arizona. The authors found that any evaluation of the taxonomy of the Sonoran pronghorn should not only evaluate genetic information, but should also rely on extensive morphological and ecological analysis; which to date have not been completed.

The Sonoran pronghorn is the smallest subspecies of *Antilocapra americana*. 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. 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 geographically isolated due to barriers such as roads and fences, and in the case of the two Sonora sub-populations, by distance. Critical habitat has not been designated for the pronghorn.

The 1982 Sonoran pronghorn Recovery Plan (U.S. Fish and Wildlife Service 1982) was revised in 1998 (U.S. Fish and Wildlife Service 1998a). 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 February 2001, the D.C. Federal District Court ordered the Fish and Wildlife Service to reassess Sonoran pronghorn recovery criteria and to provide estimates of time required to perform recovery actions detailed in the 1998 plan. In response, a supplement and amendment to the 1998 Final Revised Sonoran pronghorn Recovery Plan was prepared (U.S. Fish and Wildlife Service 2001). We concluded that, given the nature of the current threats, unknown elements of pronghorn life history and habitat requirements, uncertainty of availability of suitable reintroduction sites and animals for transplants, internal and external resistance to pro-active management actions on wilderness and other areas of public lands, and continuing uncertainty regarding the long-term stability and status of sub-populations in Mexico, the data do not yet exist to support establishing delisting criteria. Tasks necessary to accomplish reclassification to threatened status (as outlined in the 1998 plan) should provide the information necessary to determine if and when delisting will be possible and what the criteria should be.

## **B. Life History**

Sonoran pronghorn inhabit one of the hottest and driest portions of the Sonoran Desert. They forage on a large variety of perennial and annual plant species (Hughes and Smith 1990, Hervert *et al.* 1997b, U.S. Fish and Wildlife Service 1998a), and will move in response to spatial limitations in forage availability (Hervert *et al.* 1997a). Although it is theoretically possible for pronghorn to meet water requirements through forage consumption (Fox *et al.* 1997), after subtracting water required for excretion, respiration, and evaporation (approximately 50 percent), predicted water intake from forage was not adequate to meet minimum water requirements for 14 of 20 simulated diets (Fox *et al.* 2000). Sonoran pronghorn will drink surface water if it is available (U.S. Fish and Wildlife Service 1998a).

Pronghorn consume a wide variety of plants. Fecal analysis indicated Sonoran pronghorn consume 69 percent forbs, 22 percent shrubs, 7 percent cacti, and 0.4 percent grasses (U.S. Fish and Wildlife Service 1998a). During drought years, Hughes and Smith (1990) reported cacti were the major dietary component (44 percent). Consumption of cacti, especially chain fruit cholla (*Cylindropuntia fulgida*, Pinkava 1999), provides a source of water during hot, dry conditions (Hervert *et al.* 1997b). Other important plant species in the diet of the pronghorn include pigweed (*Amaranthus palmeri*), ragweed (*Ambrosia* sp.), locoweed (*Astragalus* sp.), brome (*Bromus* sp.), and snakeweed (*Gutierrezia sarothrae*) (U.S. Fish and Wildlife Service 1998a).

Sonoran pronghorn rut during July-September, and does with newborn fawns have been observed from February through May. Parturition corresponds with annual spring forage abundance. Data from 1995 to 2001, show that during the months of February through August, radio-collared does with fawns made use of areas south of the south end of the Mohawk Dunes

and in the south-central Mohawk Valley in BMGR-West, the central San Cristobal Valley in BMGR-East, the south Mohawk Valley between the Bryan Mountains and Sierra Pinta and the bajadas between Childs Mountain and the Growler Mountains in the Cabeza Prieta NWR, and bajadas in the vicinity of the Bates and Puerto Blanco Mountains and Organ Pipe Cactus NM. The data show that other areas in BMGR-West, BMGR-East, Cabeza Prieta NWR, and Organ Pipe Cactus NM are also used by does with fawns during these months depending on previous rains and forb drying. Use of the more northern locations in BMGR-West and BMGR-East occurred principally during the winter and early spring months but were typically abandoned for four locations in Cabeza Prieta NWR and Organ Pipe Cactus NM during the hotter late spring and summer months, depending on rainfall patterns and forb drying. During drought periods, does with fawns were observed in BMGR-East, Cabeza Prieta NWR and Organ Pipe Cactus NM throughout the period of February through August. 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 2 months (Byers 1997). Does gather with fawns, and fawns sometimes form nursery groups (U.S. Fish and Wildlife Service 1998a). Hughes and Smith (1990) recorded an average group size of 2.5 animals; however, group size observed by Wright and deVos (1986) averaged 5.1, with the largest group containing 21 animals. Group size likely varies with population size. At that time the U.S. sub-population was roughly about 100 animals (Arizona Game and Fish Department 1981, 1986).

The results of telemetry studies in 1983-1991 indicated that Sonoran pronghorns non-randomly use their habitats (deVos 1998). Pronghorn move from north to south or northwest to southeast, and upslope into chain fruit cholla areas as late spring and summer progress depending on rainfall patterns and forb drying. Movements are most likely motivated by the need for thermal cover provided by leguminous trees and water available in succulent cacti such as chain fruit cholla (Hervert *et al.* 1997b), that are more abundant on bajadas and in the southern portion of the pronghorn's range. Home range size of Sonoran pronghorn ranged from 24.9 to 468 m<sup>2</sup> for males and from 15.7 to 441 m<sup>2</sup> for females (Wright and deVos 1986).

Causes of pronghorn mortality are often difficult to determine; however, some radio-collared Sonoran pronghorn have been killed by coyotes, mountain lions, and bobcats (J. Morgart, Cabeza Prieta NWR, pers. comm. 2003). Some of these mortalities may have been influenced by dry periods, which predisposed pronghorn to predation (U.S. Fish and Wildlife Service 1998a). 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. 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 [(J. Hervert, Arizona Game and Fish Department, pers. comm. 2002)].

### C. Habitat

Turner and Brown (1982) described seven subdivisions of Sonoran Desert scrub, two of which encompass the habitat of Sonoran pronghorn in the U.S. and the Pinacate Region of Sonora (Felger 2000). These are the Lower Colorado River Valley and the Arizona Upland subdivisions. Creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are dominant perennials of the Lower Colorado River Valley subdivision. Plant species along major water courses include ironwood (*Olneya tesota*), blue palo verde (*Parkinsonia floridum*), and mesquite (*Prosopis velutina* and *P. glandulosa*). Species in the Arizona Upland include foothill palo verde (*Parkinsonia microphyllum*), catclaw acacia (*Acacia greggii*), chain fruit cholla, teddy bear cholla (*Cylindropuntia bigelovii*), buckhorn cholla (*C. acanthocarpa*), and staghorn cholla (*C. versicolor*).

The habitat of the pronghorn in the U.S. consists of broad alluvial valleys separated by block-faulted mountain and surface volcanics. In December 1984, 40 percent of the pronghorn observed during a telemetry flight were in the Growler Valley, from the Aguila Mountains to the International Border. Arizona Game and Fish Department (1985) reported that pronghorn use flat valleys and isolated hills to a greater degree than other topographic features.

Drainages and bajadas are used by pronghorn during spring and summer. Washes flow briefly after rains during the monsoon season and after sustained winter rains. The network created by these washes provides important thermal cover (shade) for pronghorn during the hot summer season. Bajadas are used as fawning areas in the spring. Pronghorn were observed using palo verde, ironwood, and mesquite for cover during weekly Arizona Game and Fish Department telemetry flights, which began in 1994 (Hervert *et al.* 1997b). Pronghorn were observed in playas in April and May of 1988 and 1989 when forbs were abundant, later vacating these areas when desiccation of annuals occurred (Hughes and Smith 1990). In years with sufficient winter and spring precipitation, some playas produce abundant annual plant growth as do some target areas on the BMGR.

Some of the sandy areas within pronghorn habitat such as Pinta Sands, the Mohawk Dunes west of the Mohawk Mountains, and the west side of the Aguila Mountains, provide a greater variety of seasonal vegetation when precipitation events occur. The openness of these areas appears to be attractive for pronghorn as the annuals, grasses, and shrubs provide good forage, particularly in the spring. These areas have long been considered significant pronghorn habitat in the U.S. Carr (1974) reported seeing pronghorn frequently in the Pinta Sands area. Due to the more arid nature of valley and dune habitats, annuals dry and cure, with decreased palatability for pronghorns as summer approaches. Also, these habitats lack sufficient woody vegetation to satisfy pronghorn requirements for nutrition and thermal protection. These factors limit the

temporal suitability of these areas and most pronghorn move to bajadas and washes in the southeastern portion of the range by early summer.

#### **D. Distribution and Abundance**

##### *United States*

Prior to the identification of the subspecies known as the Sonoran pronghorn (Goldman 1945), specimens of pronghorn taken within its range were identified as other subspecies (Arizona Game and Fish Department 1981). 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 2).

During an international boundary survey conducted from 1892 through 1894, pronghorn were found in every open valley along the international boundary from Nogales, Mexico to Yuma, Arizona (Carr 1971). In 1893, Mearns (1907) reported seeing a herd of 12 pronghorn near border monument 143 in the Baboquivari Valley and small numbers in the Santa Rosa Valley near monument 161 on what is now the Tohono O’odham Nation. Nelson (1925) stated that in 1923, local people reported that a few pronghorn were still ranging in the Santa Rosa Valley. Carr (1970) noted the “sighting of eight antelope near Pisinimo on the “Papago Indian Reservation” (Tohono O’odham Nation) which most likely drifted north from Mexico,” and that “there have been numerous rumors of antelope in the Papago country”; however, no recent reliable observations are known. Carr (1970) also stated that there “is a considerable amount of good Sonoran antelope habitat on the Papago Indian Reservation and particularly in the Great Plains area. However, Indian hunting and grazing practices prohibit a lasting resident antelope population.” Fencing on rangelands probably also created barriers to pronghorn movement on the Reservation and elsewhere. In 1894, pronghorn were abundant near monuments 178 and 179, and westward to Tule Well (Mearns 1907). In February 1894, Mearns observed them in the Lechuguilla Desert, as well. In the Colorado Desert (presumably west of the Gila and Tinajas Altas mountains), Mearns (1907) reported that pronghorn were not abundant. He observed pronghorn tracks in California at Gardner’s Laguna, 6 miles south of monument 216, and 37 miles west of the Colorado River; and then again at Laguna Station, 7 miles north of monument 224 and 65 miles west of the Colorado River.

While Mearns (1907) suggested that pronghorn may have been common in some areas in the late 1800s, evidence suggests that the sub-population declined dramatically in the early 20<sup>th</sup> 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) 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 three population models from 1992 through 2002.

Bright *et al.* (2001) defined the current U.S. range of the Sonoran pronghorn as bordered by Interstate 8 to the north, the International Border to the south, the Copper and Cabeza mountains to the west, and SR 85 to the east (see Figures 1 and 3). This area encompasses 2,508 mi<sup>2</sup> (Bright *et al.* 2001). Based on pronghorn location records from 1994-2001 (Figure 3), locations of pronghorn from 1983-1995, and observations by Carr (1972) and Hall (1981), pronghorn are believed to have occurred most frequently in the recent past in the following areas: Pinta Sands, Growler Valley, Mohawk Valley, San Cristobal Valley, and between the Growler and Little Ajo Mountains (Daniel's Arroyo area). Wright and deVos (1986) stated that observations in the Growler Valley were frequent and that the Mohawk Valley, San Cristobal Valley, and BMGR supported herds of 10 to 20 animals during most of the year. Also mentioned was a regularly observed herd of 7 to 10 pronghorn in the Cameron tank area on BLM lands near Ajo.

Occasional sightings of pronghorn are recorded outside of the range defined by telemetry locations in Figure 3. For instance, a possible pronghorn sighting occurred east of Aztec and north of Interstate 8 in 1990 (U.S. Fish and Wildlife Service 1998a). Two adult pronghorn were observed in 1990 (U.S. Fish and Wildlife Service 1998a) in the northern San Cristobal Valley approximately 5 miles southeast of Mohawk Pass in the Mohawk Mountains. In 1987, a Border Patrol agent reported a pronghorn on the Tohono O'odham Nation; this sighting was not confirmed.

Although observations of pronghorn were common along and east of SR 85 many years ago, observations east of SR 85 in recent years have been very rare since the mid-1970s. The paucity of recent observations east of the highway indicates that this heavily-used road currently poses a barrier to eastward movement. On June 12, 1996, however, an adult doe pronghorn was observed running west off the right-of-way at the approach of a vehicle on the north end of the Crater Range (R. Barry, Luke AFB, pers. comm. 1996). There also exists an unconfirmed report of four Sonoran pronghorn attempting to cross SR 85 in August 1993 approximately one mile north of the Organ Pipe Cactus NM visitor center. A juvenile crossed the highway (two lanes) to the east, but with the approach of a vehicle, ran back across the road to rejoin a group of three pronghorn (T. Ramon, Organ Pipe Cactus NM, pers. comm. 1993). In July 2002, a radio-collared pronghorn crossed SR 85 and continued on to the base of the Ajo Mountains where it later died in August 2002. In September 2002, a second radio-collared pronghorn crossed SR 85. This animal spent most of its time in the vicinity of Ajo Mountain Scenic Loop road, just off the southwestern end of the Diablo Mountains. After 8 days, she crossed back to the west side of Highway 85, and moved to a locally green area in the Growler Valley west of the monument. These seemingly aberrant movement patterns were likely the result of nutritional stress brought on by the 2002 drought, discussed further below. On July 3, 2003, a pronghorn was again observed crossing SR- 85 just north of the Organ Pipe Cactus NM's Visitor Center.

In recent years, the Tohono O'odham Nation has not been accessible to state and Federal biologists to survey for Sonoran pronghorn. A Border Patrol agent reported a pronghorn on the

Nation lands in 1987 (U.S. Fish and Wildlife Service 1998a), and although unconfirmed, this is the last report of Sonoran pronghorn on the Nation. There are no recent records of pronghorn south of the Nation in Sonora. Carr (1970) reported that hunting and grazing on the Nation was not compatible with maintaining a viable population of pronghorn. Phelps (1981) reported that pronghorn had not been observed on the Nation for 10 years. These observations suggest that pronghorn are likely extirpated from the Nation and adjacent areas.

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 (U.S. Fish and Wildlife Service 1998a, Bright *et al.* 2001). The 1994 survey occurred in March (whereas those of other years occurred in December) and therefore the number may be slightly inflated because of the sightability of pronghorn at this time of year (J. Morgart, FWS, pers. comm. 2001). However, the 1994 survey estimate remains useful as a population trend indicator. Different population models may result in divergent estimates. Therefore, the inclusion of estimates obtained prior to 1992 in the analysis of population trends is not reasonable.

Some researchers believe that the number of pronghorn observed on transects is more statistically valid for the evaluation of population trends than estimates generated by population models (Johnson *et al.* 1991, Hervert *et al.* 1997a). For instance, the number of pronghorn observed on transects decreased by 32 percent from 1992 to 2000 (Table 2). Contrary to the sightability model estimate, the number of pronghorn observed on transects showed a minor increase, while the total number of pronghorn sighted actually decreased in 1994 compared to the 1992 survey. Sightability model estimates declined from 282 in 1994 to 130 in 1996. 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 suggests that the decline was real. Five consecutive six-month seasons of below normal precipitation (summer 1994 through summer 1996) throughout most of the Sonoran pronghorn range, likely contributed, in part, to observed mortality (Bright *et al.* 2001, Hervert *et al.* 1997b).

Adult mortality has been high in recent years, with predator-related mortality being the most frequently identifiable proximate cause of death (one of the recovery actions identified by the recovery team is development of a narrowly-defined and rigidly controlled coyote removal plan). Thirty-five adult pronghorn have been radio collared by Arizona Game and Fish Department since 1994. Of these, 31 (88 percent) have since died. A total of 13 of these mortalities were attributed to predation, while the remaining died from unknown causes. Some of the 18 mortalities attributed to unknown causes were likely caused by predation (J. Hervert, pers. comm. 2002); however, unavoidable lag times between time of death and scene investigation caused evidence to be obscured. No evidence of predation of pronghorn was documented near water sources (Hervert *et al.* 2000). Capture myopathy (physiological condition of an animal, caused by fear, stress, and/or overexertion that sometimes manifests itself during or up to 14 days after capture; left untreated the effects can range from temporary debilitation to death) may have played a role in up to five of the mortalities in 1994 (Hervert *et al.* 2000). In the majority of documented mortalities, bone marrow condition was assessed. Only one specimen was

determined to be in poor to fair condition, while all others were determined to be in good condition.

Mortality of radio-collared adults in 2002 was exceptionally high. At the start of the year, seven radio-collared Sonoran pronghorn were at large in the U.S. sub-population. By December 2002, all but one of these had died. For most, drought stress was considered to be the proximate cause. For those animals that may have succumbed to predation, it was suspected that drought stress was again a factor, by making the animal more vulnerable to predation, due to an emaciated physical condition and being forced into predator habitats by drought. Three of these 2002 mortalities were females of prime breeding age (5-7 years old) with no identifiable cause of death. Given their relatively young age, lack of any signs of disease or predation, and the timing of their deaths during one of the most severe drought years ever recorded, these animals probably died of heat stress and/or malnutrition resulting from inadequate forage conditions due to drought (J. Hervert, pers. comm. 2002). The deaths of these prime-age individuals is indicative of how severe conditions were in 2002. Three pronghorn sightings during the summer of 2002 in various parts of their range verified their declining condition. In July 2002, adult pronghorn were observed on Organ Pipe Cactus NM, Cabeza Prieta NWR, and the North TAC of BMGR. In all three cases, observers described the pronghorn as emaciated, with ribs visible, and rough-coated (M. Coffeen, FWS, pers. com. 2002). In August 2000, two pronghorn were spotted on the BLM's Cameron allotment about 2-3 miles south of Ajo by a Border Patrol agent. The agent reported the animals appeared "skinny" but were not emaciated or staggering.

The 2002 drought was one of the driest on record. As an example, annual rainfall at the Organ Pipe Cactus NM visitor center was only 2.54 inches in 2002 (T. Tibbitts, Organ Pipe Cactus NM, pers. comm. 2002); *average* annual rainfall for the visitor center is 9.2 inches (Brown 1994). The extreme drought conditions profoundly affected adult pronghorn, resulting in the highest adult mortality rate documented thus far. Since 1995, adult mortality has averaged 22 percent a year. Yearly mortality rates have fluctuated around this mean in direct relationship with precipitation. In 1997 and 1999, years with relatively good rainfall, there was only 12 and 10 percent adult mortality, respectively. In contrast, during 1996, a relatively severe drought year, a 38 percent adult mortality was documented. The 2002 population survey conducted in November and December 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). Applying these data to the Arizona Game and Fish Department sightability model results in a population estimate of 21 animals (18-33, 95 percent confidence interval), or a 79% decline from 2000. Also, very few fawns survived in 2002 to replace these dying adults. Because of the poor condition and low survivorship of animals during the rut in late summer and early fall, there was some concern that surviving pronghorn may not have bred. However, several fawns have been detected in 2003. Adult pronghorn appear to be in good condition thus far, and the winter rains produced a good crop of ephemeral forage (J. Morgart, pers. comm. 2003).

Although drought was likely the proximate cause of the dramatic decline of the U.S. sub-population in 2002, anthropogenic factors, especially habitat reduction, almost certainly contributed to or exacerbated the effects of the drought. Historically, pronghorn likely moved to



wetted areas and foraged along the Rio Sonoyta, Sonora, and the Gila and probably Colorado rivers during drought. These areas are no longer accessible for 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). At least for the El Pinacate sub-population, observations of forage availability in the El Pinacate area from 2000-2002 and proximity to the U.S. population suggest the El Pinacate sub-population experienced the same severe drought that occurred on the Arizona side (T. Tibbitts, J. Morgart, pers. comm. 2003). Yet that sub-population fared much better than its U.S. counterpart. The high level of human activities and disturbance on the U.S. side, particularly in regard to undocumented alien traffic, smugglers, and law enforcement response, as compared to what occurs in the El Pinacate area, may be a contributing factor in the difference in rate of decline observed north and south of the border. We do not have data on differences in demographics, predation rates, or other factors between Mexican and U.S. populations that may have also contributed to differences in rates of decline from 2000-2002. See the section entitled "Drought" in the Environmental Baseline and "Cumulative Effects" for further discussion.

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). For the Sonoran pronghorn PVA, these factors included impacts of inbreeding, fecundity, fawn survival, adult survival, impacts of catastrophes, harvest, carrying capacity, and numbers and sex/age composition of the present population. Use of three models were discussed at the workshop, but the PVA was only completed with one of the models - Vortex (Hosack *et al.* 2002) - due limited funding. 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, 9 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. 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.

Furthermore, the PVA suggested that the current pronghorn population is extremely sensitive to fawn mortality, with the likelihood of extinction increasing markedly when fawn mortality exceeds 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. This level of reproductive success has only been achieved in two of the last nine years. Fawn survival is correlated with precipitation (Hervert *et al.* 1997b). With above average precipitation in 1998, 33 fawns per 100 does were

produced (Bright *et al.* 2001). In 2001, precipitation levels in the pronghorn range were the highest seen in many years. Pronghorn numbers increased from 99 in December 2000 to approximately 140 individuals in December 2001 (based on an estimated increase of 50 individuals by recruitment, minus an estimated adult mortality rate of 11 percent). However, as discussed above, during the severe drought in 2002, all the gains from the previous year were lost. Although an estimated 50 fawns were recruited into the sub-population in 2001, it appears few of these young and still-maturing animals survived the severe drought conditions of 2002. However, a dead pronghorn thought to be a 2001 fawn was discovered in 2002. The animal was obviously killed by a bobcat, but appeared to be in good condition, with lots of fat in the body cavity. The 2002 fawn crop was estimated to be from one to five (J. Morgart, pers. comm. 2002), consistent with trends of low fawn crops in low precipitation years.

The Sonoran pronghorn's previously poor status, coupled with dramatic declines in both recruitment and adult survival during 2002, have resulted in the serious imperilment of the U.S. sub-population. Actions taken by Federal and state agencies in the immediate future will determine whether the Sonoran pronghorn will continue to survive in the United States. We, in close cooperation with the Arizona Game and Fish Department, Department of Defense, and other partners are initiating a series of emergency projects, such as providing water and forage enhancement projects, as well as embarking on longer term recovery actions, including developing a semi-captive breeding facility, to increase the likelihood that the U.S. sub-population will persist (see *Emergency Recovery Actions* in the Environmental Baseline for additional information).

### *Mexico*

Historically, Sonoran pronghorn ranged in Sonora from the Arizona border south to Hermosillo and Kino Bay, west to at least the Sierra del Rosario, and east to the area south of the Baboquivari Valley on the Tohono O'odham Nation (Nelson 1925, Carr 1974, Monson 1968). The distribution in Baja California Norte 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) west of Highway 8 near the Pinacate Lava flow; and (2) north and west of Caborca and southeast of Highway 8. In 2001, a park ranger at Pozo Nuevo, El Pinacate y Gran Desierto de Altar Biosphere Reserve (El Pinacate), reported that pronghorn have been seen in recent years west of Volcan Pinacate to the Pozo Nuevo area, and reportedly use a cement cattle trough north of Pozo Nuevo (J. Rorabaugh, pers. comm. 2001).

Sub-populations of Sonoran pronghorn in Mexico had not been exhaustively surveyed until all suitable habitat within the current known range of the Sonoran pronghorn in Mexico was surveyed in December 2000 (Bright *et al.* 2001). Although the 1993 estimate was approximate, survey results suggested a decline in the sub-populations of 16 percent from 1993 to 2000 (Table 3). The December 2000 estimate was 346 individuals. This estimate, together with the 2001 U.S. estimate, provided a total estimated size of the U.S. and Mexico Sonoran pronghorn sub-

populations in 2000-2001 of approximately 445 individuals (J.L. Bright *et al.*, Arizona Game and Fish Department, unpubl. data). Although the Sonoran pronghorn sub-populations in Mexico declined approximately 16 percent from 1993 to 2000, the decrease was not experienced equally across pronghorn range. Sonoran pronghorn habitat in Mexico is bisected by Highway 8. The sub-population southeast of Highway 8 remained stable or even increased slightly between 1993 and 2000 (Table 3). Forage conditions in 2000 were notably better in this area than the rest of Sonoran pronghorn range in Mexico and the U.S. (J. L. Bright *et al.*, Arizona Game and Fish Department, unpubl. data). The sub-population west of Highway 8 ranges throughout suitable habitat on and surrounding Volcan Pinacate, and is adjacent to the U.S. sub-population. Mexico Highway 2 (and to a lesser extent the international boundary fence) acts as a barrier to movement between El Pinacate and U.S. sub-populations. The El Pinacate sub-population declined by approximately 73 percent between 1993 and 2000 (Table 3). Dry periods and associated poor forage conditions, likely exacerbated by extensive livestock grazing, may have figured prominently in the significant decline observed in the El Pinacate sub-population. Pronghorn moving across Highway 8 to the southeast may also be an explanation for the changes in these sub-populations' sizes. Between 1993 and 2001, Highway 8 was widened and improved, increasing traffic and probably increasing its effectiveness as a barrier to pronghorn movement.

The two Mexico sub-populations were resurveyed in December 2002. A grand total (both El Pinacate and southeast of Highway 8) of 214 pronghorn in 32 groups were seen for a tentative population estimate of 280. (Note this may underestimate the sub-population due to animals that apparently moved between survey blocks between counts.) This represented a decline from the total number seen (266 - decline of 20 percent) and estimated (346 - decline of 19 percent) in December 2000. A total of 19 pronghorn were observed in the El Pinacate area for an estimate of 25. This is down from 34 estimated in 2000 (decline of 26 percent). In regard to the sub-population southeast of Highway 8, 195 pronghorn were observed, which extrapolates to an estimate of 255. This is also down somewhat from the 2000 estimate when 249 were observed, with an estimate of 311 (decline of 18 percent). Based on the 2002 surveys, the total number of pronghorn in the U.S. and Mexico is estimated at 301, a decline of 32 percent from 2000 (Bright *et al.* unpubl. data).

## **E. Threats**

### *Barriers that Limit Distribution and Movement*

Sonoran pronghorn require vast areas of unencumbered open range to meet their annual needs for survival and reproduction. This includes the ability to freely travel long distances between localized, seasonally sporadic rainfall events in search of forage. Highways, fences, railroads, developed areas, and irrigation canals can block these essential movements. Highway 2 in Mexico runs parallel to the southern boundary of Cabeza Prieta NWR and divides the range of the pronghorn between the U.S. and El Pinacate sub-populations. This highway supports a

considerable amount of fast-moving vehicular traffic, and is fenced along its length, so is likely a substantial barrier to Sonoran pronghorn. In 1999, Dr. Rodrigo Medellín of Instituto de Ecología reported that Sonora, Mexico is planning to widen and improve Highway 2 to four lanes, which would further reduce the likelihood of pronghorn crossing the highway. Both Cabeza Prieta NWR and Organ Pipe Cactus NM maintain boundary fences along the border. At the southern boundary of Cabeza Prieta NWR, a seven-strand livestock fence has been a substantial barrier to pronghorn; however, some large gaps now exist in the fence, apparently as a result of theft of the fence posts and wire. The fence is periodically repaired. Modifying the fences along the U.S./Mexico border to allow pronghorn passage could aid in maintaining genetic diversity if sufficient pronghorn movement occurred. It may, however, also lead to increased pronghorn fatalities from motorized traffic on Highway 2. Mexico has been involved in discussions regarding the fences, as any modifications could potentially affect pronghorn sub-populations in both countries. Sonoran pronghorn habitat in Mexico is also bisected by Highway 8 between Sonoyta and Puerto Peñasco. This highway is bordered in part by a livestock fence and receives considerable tourist traffic. A less-traveled highway runs from Puerto Peñasco to Caborca.

Between Gila Bend and Lukeville, Arizona, SR 85 appears to be a significant barrier to pronghorn dispersal eastward from their current range. Traffic volume and average speeds have increased substantially over the last 30 years as international trade and tourism have increased. The Arizona Department of Transportation increased the posted speed limit on SR 85 from 55 to 65 miles per hour (mph) in 1997, and 85<sup>th</sup> percentile traffic speed has increased from 68-71 mph in the same period (Organ Pipe Cactus NM 2001). This highway corridor is unfenced in Organ Pipe Cactus NM, allowing potential free movement of pronghorn and other wildlife, but has livestock fencing on both sides for most of the remaining mileage on BLM, DoD, and private lands between Interstate 8 and Organ Pipe Cactus NM. Interstate 8, the Wellton-Mohawk Canal, agriculture, a railroad, and associated fences and human disturbance near the Gila River act as barriers for northward movement of pronghorn. De-watering of reaches of the Sonoyta River and some portions of the lower Gila River, and barriers to pronghorn accessing the Gila River, such as Interstate 8 and the Wellton-Mohawk Canal, have 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, Sonora; in the Mexicali Valley, Baja California Norte; and at Ajo, Yuma, and along the Gila River, Arizona, have removed habitat and created barriers to movement. BLM grazing allotment fences in the Ajo area have been modified to allow safe passage of pronghorn. Although fences can be designed to encourage safe passage, pronghorn are less likely to move across any fence line, regardless of design, than through an area without fences (J. Morgart, pers. comm. 2002). The BLM proposes to lay down the fences on portions of the Cameron allotment during the summer, this proposal is scheduled to be implemented during fiscal years 2004-2006.

Historically, pronghorn occurred in the Lechuguilla Desert and in low numbers in the Colorado Desert to the west of the Gila and Tinajas Altas mountains (Mearns 1907). No apparent barrier

to movement from their current range to the Lechuguilla Desert exists. Interstate 8, Mexico Highway 2, and the Gila and Tinajas Altas mountains form a substantial barrier to movement between the Lechuguilla Desert and the Yuma Desert; however, pronghorn could potentially use Tinajas Altas pass as a corridor through the mountains.

### *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 buffleggrass in Sonora; dewatering and development along the Gila River and Rio Sonoyta; increasing undocumented immigration and drug trafficking across the international border and associated law enforcement response; and roads, fences, canals, and other artificial barriers.

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. Other investigators have shown that heart rate increases 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).

A pronghorn can canter effortlessly at 25 mph, gallop without straining at 44 mph, and run flat out at speeds of 55-62 mph (Byers 1997). During an aerial reconnaissance, one herd of Sonoran pronghorn was observed 12 miles away from the initial observation location 1.5 hours later (Wright and deVos 1986). Hughes and Smith (1990) found that pronghorn immediately ran 1,310-1,650 feet from a vehicle, and that military low-level flights (<500 feet AGL) over three pronghorn caused them to move about 330 feet from their original location. Krausman *et al.* (2001) examined effects of military aircraft and ground-based activities on Sonoran pronghorn at the North and South TACs and concluded that behavioral patterns were similar with and without presence of military stimuli. Military activities, both ground-based and aerial, were associated with some changes in behavior (e.g., from standing to trotting or running, or bedded to standing) but the authors concluded that these changes were not likely to be detrimental to the animals. Eighty-seven (4.1 percent) of the 2,128 events with ground-based stimuli resulted in pronghorn changing their behavior to trotting or running; a total of 866 (41 percent) resulted in some change in behavior. Krausman *et al.* (2001) documented 149 direct overflights and 263 other overflights (in which the aircraft passed  $\geq$ 328 feet to the side of the animal). Pronghorn changed their behavior 39 and 35 percent of the time during direct and other overflights, respectively.

Krausman *et al.* (2001) did not address the pronghorn's response to low-level helicopter flights. A study is being developed to quantify effects of helicopter flights by the Border Patrol on Sonoran pronghorn (J. deVos, Arizona Game and Fish Department, pers. comm. 2002). No conclusions could be drawn about effects to fawns due to poor fawn productivity during the Krausman *et al.* study. During times of drought, disturbances that cause pronghorns to startle and run would energetically have a more significant effect. Such energetic expenditures, particularly during times of stress, may lead to lower reproductive output and/or survival of individual animals (Geist 1971).

### *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). This is especially true in the arid Sonoran Desert. Cattle and other domestic livestock were first brought to northwestern Sonora, Mexico, in 1694 (Wildeman and Brock 2000). Overgrazing well into the 19<sup>th</sup> 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).

American ranchers were running livestock by the early 1900s in much of the area that would later become Organ Pipe Cactus NM (Rutman 1997) and Cabeza Prieta NWR (Cabeza Prieta NWR files). Because there was no international boundary fence until 1947, livestock from both the U.S. and Mexico ranged freely across the border (Rutman 1997). Rutman (1997) estimates 1,000 head of burros and horses were present in 1942 on the southern half of Organ Pipe Cactus NM, and as many as 3,000 cattle were present on Organ Pipe Cactus NM at one time. Cattle were removed from Organ Pipe Cactus NM, Cabeza Prieta NWR, and the BMGR in 1979, 1983, and 1986, respectively (U.S. Fish and Wildlife Service 1998a, Rutman 1997). Grazing continues to be an important use of currently used pronghorn habitat on BLM lands south of Ajo, former pronghorn habitat on the Tohono O'odham Nation and the Altar Valley, and in current and former habitats in Sonora. Wright and deVos (1986) stated that poor habitat conditions (caused in part by livestock grazing) still appeared to be the leading cause in the decline in Sonoran pronghorn numbers. In Sonora, livestock grazing occurs in ejidos (community ranches or farms) and other ranch lands throughout much of the range of the pronghorn. Cattle range farther in years with abundant annual growth and are more limited to areas near water during hot and dry periods and seasons.

Mining occurred historically throughout much of the U.S. range of the pronghorn. Miners probably hunted pronghorn and disturbed habitat locally. Mining is currently not a significant threat to Sonoran pronghorn in the U.S. No mining occurs now on the BMGR or Organ Pipe Cactus NM. Cabeza Prieta NWR has one active mining claim. The open pit and associated tailings piles at the Phelps Dodge copper mine at Ajo eliminated habitat in that area (MCAS-Yuma 2001, Organ Pipe Cactus NM 2001), but the mine is no longer in operation. During pronghorn surveys in Mexico in 2002, increasing effects from mining activities were noted in habitats used by the sub-population located southeast of Highway 8.

Illegal crossings by undocumented immigrants and drug smugglers in the U.S. range of the pronghorn have increased dramatically in recent years. Deportable migrant apprehensions by Border Patrol agents in the Ajo Station increased steadily from 9,150 in 1996 to 20,340 in 2000 (U.S. Immigration and Naturalization Service 2001). In 2001, estimates of undocumented migrants traffic reached 1,000 per night in Organ Pipe Cactus NM alone (Organ Pipe Cactus NM 2001) and an estimated 150,000 people entered the monument illegally from Mexico (Milstead and Barns 2002). Illegal border-related activities and Border Patrol response have resulted in widespread habitat degradation and increased human presence in remote areas. Increased presence of Border Patrol in the Douglas, Arizona area, and in San Diego (Operation Gatekeeper) and southeastern California, have pushed undocumented migrant traffic into remote desert areas, such as Cabeza Prieta NWR, Organ Pipe Cactus NM, and the BMGR (Klein 2000).

#### *Small Population Size and Random Changes in Demographics*

A possible minimum viable population for pronghorn is 50 animals (Reed *et al.* 1986, Scott 1990). At populations of less than 100, population viability declines at an increasingly steep rate. To maintain genetic diversity over the long term, a population of at least 500 is desirable (Defenders of Wildlife 1998). The U.S. sub-population is now estimated at 21 after the 2002 drought. At an estimated 25 in 2002 the El Pinacate sub-population is also well below the possible minimum viable population. Thus, 2 of the 3 pronghorn sub-populations are seriously endangered. At 280 animals, the third sub-population (southeast of Highway 8) may be too small to maintain genetic diversity. Loss of the U.S. sub-population would dramatically reduce our ability to manage or recover this subspecies. Populations at low levels may experience random variations in sex ratios, age distributions, and birth and death rates among individuals, which can cause fluctuations in population size and possibly extinction (Richter-Dyn and Goel 1972). The sex ratio as of December 2002 was skewed in favor of females (male:female ratio of 6:15, J. Morgart, pers. comm. 2003]), which may be advantageous in regard to reproductive potential. However, the small number of males may mean that some females may not encounter and breed with a male. In the future, a scenario in which males outnumber females by a similar margin is just as likely. 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).

In 2000, we were concerned that, because of limited recruitment over the last seven years, an estimated 56 percent of the sub-population was more than six years of age. Pronghorn rarely live more than nine years (Bright *et al.* 2001). However, the pronghorn that survived severe conditions in 2002 are likely younger animals (J. Hervert, pers. comm. 2003).

#### *Disease*

Sonoran pronghorn can potentially be infected by at least one bacterial (leptospirosis) and two viral (bluetongue and epizootic hemorrhagic disease) diseases. Bluetongue virus and epizootic hemorrhagic disease virus together produce a hemorrhagic disease syndrome. Pronghorn are

susceptible to an additional two bacterial (Arcanobacterium and Fusobacterium) and four viral (parainfluenza, St. Louis encephalitis, vesicular stomatitis, and malignant catarrhal fever) diseases. Blood testing has shown pronghorn exposure to these diseases by increases in antibody titers over time. A number of other viral diseases, in particular, are known to affect North American ungulates and antelope and gazelle worldwide, including but not limited to, infectious bovine rhinotracheitis, bovine viral diarrhea and bovine syncytial virus (Williams and Barker 2001). The specific names, etiologies, signs, symptoms, reservoirs/hosts/transmission modes, controls, and applicable literature for those diseases specific to pronghorn are noted in Table 4.

Animals in general are subject to increased disease susceptibility when either very young, very old and debilitated, and/or stressed. The manner in which a particular disease is spread can also be a factor in disease risk. Noting Table 4, 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. All the diseases in Table 4 are serious diseases of cattle, as well, and often lead to mortality. Cattle within the current range of the pronghorn have not been tested for the diseases listed in Table 4.

The most serious of the diseases listed in Table 4 are the two viruses, bluetongue virus (BTV) and epizootic hemorrhagic disease virus (EHDV), which together produce hemorrhagic disease (HD) syndrome. HD, in particular, can be spread by infected cattle via fecal contamination. Bovine feces are moist and voluminous, and at watering sources where animals congregate in large numbers, this fecal material is trampled into the soil, causing a substrate and odor that attract insects that are vectors capable of spreading the HD viruses from one animal to another nearby. Pronghorn, deer, and other wild ungulates produce drier, less voluminous, pelleted feces, which are less likely to produce moisture or odors that attract vectors, such as flies or midges.

Overcrowding at essential congregating areas, such as watering sources, particularly in times of drought is another factor that sets up an optimal situation for such disease transmission. Animals are competing for scarce resources and, particularly in times of severe drought, are stressed and debilitated.

Control of diseases in general can be managed in many cases by following often-used animal husbandry practices, including: 1) keeping hosts prone to infection (such as pronghorn and cattle) separated; 2) keeping vectors under control by ensuring that moist fecal material build-up at crucial areas (such as watering sources), does not occur; and, 3) keeping overcrowding, overconcentration, stressful competition and direct contact among animals to a minimum.

## **ENVIRONMENTAL BASELINE**

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



platform from which to assess the effects of the action now under consultation.

## **Sonoran Pronghorn**

### **A. Action Area**

The “action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Within the U.S. portion of the Sonoran pronghorn’s range, pronghorn interact to form one sub-population in which interbreeding may occur. The U.S. sub-population is effectively separated from sub-populations in the El Pinacate Region and on the Gulf Coast of Sonora by Mexico Highways 2 and 8, and the U.S.-Mexico boundary fence. Activities that may affect animals in any portion of the U.S. range of the pronghorn may affect the size or structure of the U.S. sub-population, or habitat use within the U.S. range. The action area for this biological opinion is defined as the current range of the pronghorn within the U.S. (Figure 2), plus East TAC, TFTA, and SBAH, all of which are east of SR 85, outside of the current range of the pronghorn.

Management of the action area is almost entirely by Federal agencies. As discussed above, the BMGR (roughly 1.6 million acres) is managed by Luke Air Force Base and MCAS-Yuma primarily for military training. Organ Pipe Cactus NM manages 329,000 acres in the southeastern corner of the action area for scenic, ecological, natural, and cultural values. Cabeza Prieta NWR lies along the border west of Organ Pipe Cactus NM and encompasses 860,000 acres. Cabeza Prieta NWR is managed to protect, maintain, and restore the diversity of the Sonoran Desert. Most of the refuge and Organ Pipe Cactus NM are designated as wilderness. The BLM manages lands near Ajo for recreation, grazing (four livestock grazing allotments totaling 191,740 acres, and one allotment totaling 21,876 acres), and other multiple uses in accordance with the Lower Gila Resource Management Plan.

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

The action area is characterized by broad alluvial valleys separated by block-faulted mountains and surface volcanics. The Yuma Desert on the western edge of the BMGR is part of a broad valley that includes the Colorado River. It is bordered on the east by the Gila and Tinajas Altas mountains. To the east of these mountains are a series of basins and ranges; from west to east these include the Lechuguilla Desert; the Cabeza Prieta and Copper Mountains; the Tule Desert and Mohawk Valley, including the Mohawk Dunes and Pinta Sand Dunes; the Sierra Pinta, Mohawk, and Bryan mountains; the San Cristobal Valley; the Aguila and Granite mountains; the Growler Valley; the Crater Range, Growler, Bates, and Agua Dulce mountains; and the La Abra Plain and Puerto Blanco Mountains west of SR 85, eastward to the base of the Ajo Mountains. Elevations range from 180 feet in the southwestern corner of the BMGR to 3,294 feet in the Growler Mountains. Major drainages and mountain ranges run northwest to southeast. The mountains are of two major types: a sierra type, composed of metamorphic and granitic rock, and a mesa type, typically of basaltic composition. Major drainages flow mostly northward to the Gila River, although southern portions of Organ Pipe Cactus NM and the southern slope of the

Agua Dulce Mountains drain south to the Rio Sonoyta, Sonora. Climate is characterized by extreme aridity, mild winters, and hot summers. Approximately 2.7 inches of precipitation fall annually at Yuma, with slightly more than half of this occurring in the winter months (Brown 1994). Annual precipitation increases from west to east across the BMGR; at Aguajita/Quitobaquito, precipitation is 10.5 inches annually. Infrequent chubascos (tropical storms) bring heavy rains in September or October that can produce spectacular growth on warm-season perennial plants (Felger 2000).

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 1994). It is the largest and most arid subdivision of Sonoran Desert scrub. Vegetation in the valleys, particularly in the Yuma Desert, is dominated by the creosote-white bursage series of Sonoran Desert scrub (Brown 1994). This series occupies approximately three-fourths of the lowland or valley areas in the BMGR (Reichenbacher and Duncan 1989). In this series, creosote and white bursage are often co-dominants, with galleta grass (*Pleuraphis rigida*), dalea (*Psoralthamnus emoryi*), coldenia (*Tequilia plicata*) and other locally abundant species. Distinctive florals are also found in dunes in the area, particularly in the Yuma Dunes west of the Tinajas Altas Mountains, at Pinta Sands, and at the Mohawk Dunes. Species such as dune buckwheat (*Eriogonum deserticola*), Mormon tea (*Ephedra trifurca*), bugseed (*Dicoria canescens*), dune spurge (*Euphorbia platysperma*), possibly the threatened Peirson's milkvetch (*Astragalus magdalenae peirsonii*), and wire lettuce (*Stephanomeria schotti*) are found in one or more of these dune habitats. These species are dune specialists typical of the Gran Desierto dunes in northwestern Sonora (Felger 2000).

In drainages, bajadas, and montane habitats (including the Mohawk, Cabeza Prieta, Granite, and the Sierra Pinta mountains), the mixed scrub series of the lower Colorado River subdivision (Brown 1994) is found. This community is more diverse than the creosote-bursage series and includes species more representative of the Arizona Upland subdivision of Sonoran Desert scrub, such as palo verde, saguaro (*Carnegiea gigantea*), ironwood, and desert lavender (*Hyptis emoryi*), among others. Frost-sensitive species such as elephant tree (*Bursera microphylla*), limber bush (*Jatropha cuneata*), and Mexican jumping bean (*Sebastiania biloculare*) are also found in this community, but are more representative of species and genera of the Central Gulf Coast subdivision of Sonoran Desert scrub found to the south in Sonora (Dames and Moore 1995, Brown 1994).

The Arizona Upland subdivision of Sonoran Desert scrub is found in the Growler, Puerto Blanco, Ajo and Bates mountains, and surrounding bajadas. Vegetation in this community takes on the appearance of a scrubland or low woodland of leguminous trees, shrubs, and cacti. The woodland component is most developed and species richness is greatest in drainages. In the action area, common trees of the Arizona Upland include palo verdes, ironwood, catclaw acacia, and velvet mesquite (*Prosopis velutina*). Dominant cacti include saguaro, chain fruit cholla, teddy bear cholla, and organ pipe cactus. Senita cactus (*Lophocereus schottii*), more common to the south in Mexico, is found in the southern portion of Organ Pipe Cactus NM and the Agua Dulce Mountains, Cabeza Prieta NWR. Vegetation on Cabeza Prieta NWR, Organ Pipe Cactus

NM, and most of the BMGR is relatively undisturbed by human activities, although the increasing numbers of immigrants and smugglers, and law enforcement response, across these areas are resulting in elevated resource damage.

### **C. Status of the Sonoran Pronghorn in the Action Area**

#### *Distribution*

Figure 3 illustrates records of Sonoran pronghorn in Arizona from 1994-2001. Additional locations are available, but they are few in number due to the loss of all telemetered pronghorn by July 2002 (all observations since then have been incidental) and the U.S. sub-population is at its lowest level ever recorded. Based on these locations and observed locations of pronghorn from 1983-1993, pronghorn have occurred most frequently in the following areas: Pinta Sands, Growler Valley, Mohawk Valley, San Cristobal Valley, and between the Growler and Little Ajo mountains (Daniel's Arroyo area). All localities from 1994-2001 are south of Interstate 8, east of the Copper and Cabeza Prieta mountains, and west of SR 85 (Bright *et al.* 2001). Pronghorn historically crossed SR 85 to use bajada habitats in eastern portions of Organ Pipe Cactus NM, and may still attempt to do so as indicated by the presence of the two radio-collared pronghorn which moved into areas east of SR 85 during summer 2002, and an animal that crossed SR 85 in July 2003. Habitat north of Interstate 8 has not been surveyed to any extent for pronghorn, but habitat in the vicinity of the Gila River is highly fragmented by agricultural and commercial development. Interstate 8 and the Wellton-Mohawk Canal are probably barriers to movement of pronghorn. The current range of the U.S. population of the Sonoran pronghorn encompasses 1,764,568 acres, of which 1,579,588 acres are suitable habitat (excluded are mountainous areas with the current range). Of the suitable habitat, 14 percent is located in BMGR-West, 28 percent in BMGR-East and 39, 12, four, one, and one percent are owned/managed by Cabeza Prieta NWR, Organ Pipe Cactus NM, BLM, Arizona State Land Department, and private individuals, respectively (MCAS Yuma 2003).

On Cabeza Prieta NWR, pronghorn groups were most often observed on the southwestern edge of the Sierra Pinta Mountains and in the Pinta Sands, in the valley between the Sierra Pinta and Bryan mountains, the Antelope Hills between the Bryan and Agua Dulce mountains, the San Cristobal and Growler valleys, and near Daniel's Arroyo. At Organ Pipe Cactus NM, pronghorn were most often observed near Acuna and Bates wells, and west of the Bates Mountains and Cipriano Hills. On the BMGR, concentrations of animals were observed near HE Hill on South TAC, with scattered sightings through the San Cristobal Valley and into the Mohawk Valley. John Hervert (Arizona Game and Fish Department, pers. comm. 1996) has numerous locations of pronghorn in the northern portion of the Agua Dulce Mountains near Antelope Tank. Pronghorn may have used the Pinta Sands area to a greater degree in the early 1970s (Arizona Game and Fish Department 1981).

Pronghorn often seek the thermal cover found in the Arizona Upland subdivision of Sonoran Desert scrub during the hot, dry summer months. This cover is best developed in the southeastern portion of their range in Arizona. With the onset of summer rains or cooler temperatures, pronghorn may move to the more open valleys and flats, such as the Growler Valley and Pinta Sands. Rocky, mountainous terrain, such as the slopes of the Growler or Mohawk mountains, is not considered habitat for the Sonoran pronghorn (deVos 1990); however, pronghorn may be found on lower slopes and in associated washes (L. Thompson-Olais, FWS, pers. comm.1996).

### *Drought*

Rowlands (2000) examined trends in precipitation for southwestern Arizona and Organ Pipe Cactus NM 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 Organ Pipe Cactus NM, 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 (e.g. Felger [1980] notes a 34-month period, from September 1969-August 1972, without precipitation in the Sierra del Rosario, Sonora). No discernable trend in precipitation in southwestern Arizona or Organ Pipe Cactus NM was found in the 1990s, which is when the current decline in the U.S. pronghorn population began. At four stations in southwestern Arizona, Hervert *et al.* (2000) note below normal precipitation in the winters of 1995/1996 (-2.78 inches) and 1996/1997 (-2.87 inches), and wet winters in 1994/1995 (+1.97 inches) and 1997/1998 (+4.29 inches). Annual plant production was exceptional in the winter of 1997/1998 and spring of 1998. The winter of 1992/1993 and spring of 1993 also saw a very good crop of annual plants. Because of increased precipitation, the eastern portions of the pronghorn's current range, including Organ Pipe Cactus NM, are most likely to support annual plant production, and thus are disproportionately important to the pronghorn.

Organ Pipe Cactus NM (2001) examined available data on precipitation and concluded that "although substantial year-to-year variations exist, the general trend in the later 20<sup>th</sup> century has been one of slightly increasing rainfall" at Organ Pipe Cactus NM. Since Rowland's analysis, we have had one year characterized by above-average rainfall and abundant ephemeral forage (2001) and a year with virtually no precipitation or ephemeral forage (2002). Consistent with the findings of Hervert *et al.* (2000) and Bright *et al.* (2001), reproduction and survival were high in 2001 and very low in 2002. Historically, pronghorn populations must have weathered many severe droughts in the Sonoran Desert, including many that were more severe and longer term than what occurred in 2002. 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. Organ Pipe Cactus NM (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.”

### *Emergency Recovery Actions*

A number of critically important emergency recovery projects have been recently initiated in an attempt to reverse the decline of the U.S. sub-population of the Sonoran pronghorn. These projects are designed to increase availability of green forage and water during dry periods and seasons within the current range of the pronghorn, thereby offsetting to some extent the effects of drought and barriers that prevent pronghorn from accessing greenbelts and water, such as the Gila River and Rio Sonoyta. A semi-captive breeding facility will also provide a safe haven for pronghorn that hopefully will bolster the wild population. In March 2003, with funding from MCAS-Yuma and support from Bureau of Reclamation-Yuma Area Office, the Service, and Arizona Game and Fish Department, a well (Tiller Well) was drilled in Childs Valley on Cabeza Prieta NWR. In May 2003, infrastructure was put in place to pipe water to a forage enhancement plot and water trough about 1.5 miles from the well. About 6.5 acres are currently being irrigated, perennial vegetation has responded, and on June 9, pronghorn tracks were found in the plot, and the next day a pronghorn was observed in the vicinity of and moving towards the plot. In mid June a group of six (one adult male, 2 adult females, and 3 fawns) were observed near and on the plot (J. Morgart, pers. comm. 2003). Funding from MCAS-Yuma had originally been targeted for a forage enhancement plot in the Mohawk Valley of BMGR-West; however, the pronghorn recovery team requested that the funds be redirected to the Childs Valley site where it was thought pronghorn were more likely to immediately benefit from the project. MCAS-Yuma graciously agreed to redirect the funds.

Antelope Tank on the refuge has recently been redeveloped with a larger, more reliable and larger capacity, self-filling catchment system that should provide an important water source for pronghorn. Three temporary, emergency waters have been placed in remote areas of the refuge and Organ Pipe Cactus NM. Also, two badly-degraded segments of the Camino del Diablo have been repaired with airport matting, allowing access to recovery project sites. Other projects that are in development include additional emergency waters, redevelopment of two older existing wells in important pronghorn habitat on Cabeza Prieta NWR, additional forage enhancement plots, roadside watering to encourage ephemeral forage growth, initiation of a semi-captive breeding facility on the refuge, and opening of negotiations with our counterparts in Mexico for acquiring pronghorn from Mexico for augmenting the U.S. and Mexico sub-populations. The semi-captive breeding facility, under construction on the eastern side of Cabeza Prieta NWR, will initially house five pronghorn in a kilometer square enclosure equipped with a forage enhancement facility and waters. The initial five animals are expected to be obtained from Mexico. The facility is based on a successful semi-captive facility in place for the peninsular subspecies of the pronghorn in Baja California. We anticipate that the facility will provide a safe and productive environment in which fawns will be produced for release into the wild population. These crucial projects, which we hope will pull the U.S. population back from the brink of extinction, have been cooperative efforts among the Service, Arizona Game and Fish

Department, MCAS-Yuma, Luke Air Force Base, and Organ Pipe Cactus NM, with volunteer efforts from the Arizona Desert Bighorn Sheep Society, Arizona Antelope Foundation, and the Yuma Rod and Gun Club.

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

The Status of the Species section describes a variety of human activities that have affected the Sonoran pronghorn since initiation of livestock grazing over 300 years ago (Officer 1993). Most 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.

Before the Taylor Grazing Act of 1934, and land use designations such as Organ Pipe Cactus NM, the BMGR, and Cabeza Prieta NWR, unregulated cattle grazing was widespread in the current range of the pronghorn. Forage and precipitation is greater in the eastern portion of the current range, thus it is likely that grazing was more prevalent in BMGR-East, Cabeza Prieta NWR and Organ Pipe Cactus NM, than in BMGR-West (MCAS-Yuma 2001). However, cattle grazing presently occurs west of Volcan Pinacate and near the Sierra del Rosario in northwestern Sonora, which are as dry as much of BMGR-West; thus we suspect cattle grazing historically occurred throughout the current U.S. range. The degree to which cattle grazing may have affected soils and vegetation communities in this area is impossible to quantify. Humphrey (1987) compared vegetation in early photos taken at boundary monuments in the early 1890s with photos taken in the 1980s and could not discern any temporal differences in vegetation in what is now Organ Pipe Cactus NM, Cabeza Prieta NWR, and BMGR. However, the changes may have occurred before 1890. In reference to monument 172 at the southern end of the Quitobaquito Hills, Humphrey notes “the entire region near the spring has probably been grazed by domestic livestock since their introduction by the Spaniards in the early eighteenth century. Any grasses that might have grown there prior to that time had probably been grazed out long before the monument was erected.” Organ Pipe Cactus NM (2001) discusses possible effects of long-term grazing in pronghorn habitat, and apparent evidence and impacts of grazing still visible at Organ Pipe Cactus NM 25 years after cattle were removed.

Before the establishment of Organ Pipe Cactus NM, BMGR, and Cabeza Prieta NWR, mining occurred in many of the mountain ranges of the area. The copper mine at Ajo was operated by Phelps Dodge Corporation and others from 1911 to 1985. The open pit mine and its tailings eliminated pronghorn habitat east and southeast of Ajo. Smaller mining operations caused habitat disturbance locally, but most mines were in mountainous terrain outside of pronghorn habitat. Earlier mining operations in the area needed large quantities of timbers for shoring which were likely obtained from bajada habitat woodlands along riparian areas.

Hunting and poaching may have been an important factor historically in the decline of pronghorn populations early in the 20<sup>th</sup> century; however, the Sonoran pronghorn has been protected from hunting in the U.S. for more than 50 years. We are not aware of any recent poaching events (U.S. Fish and Wildlife Service 1998a); but finding evidence of poaching would be difficult across the remote landscape inhabited by this subspecies. Recreational hunting for other species

occurs within the U.S. range of the pronghorn. Of particular importance is the bighorn sheep season, which occurs in December of each year, when a small number of hunters access remote portions of Cabeza Prieta NWR and BMGR to hunt a limited number of sheep. Presence of hunters in pronghorn habitat and discharge of firearms has the potential to disturb pronghorn; however, sheep hunting occurs at a time of year when temperatures are moderate, and hunters focus their activities in the mountains whereas pronghorn are in the valleys and bajadas.

Development of agriculture, including construction of canals, roads, towns, a railroad, and other activities along the Gila River excluded pronghorn from the riparian habitats, shade, forage, and water available along the river. Similarly, construction of Sonora Highway 2, the U.S./Mexico boundary fence, and towns and agriculture along the Rio Sonoyta, excluded pronghorn from these riparian habitats, as well. Flow in the Gila and Sonoyta rivers are now much reduced or restricted to return agricultural flows or periodic flood flows. These greenbelts may have been a source of water and forage, and probably acted as buffers, to enhance survival of pronghorn during drought periods (U.S. Fish and Wildlife Service 1998a).

Numbers of undocumented immigrants and smugglers have increased dramatically in the action area. Deportable migrant apprehensions by Border Patrol agents in the Ajo Station increased steadily from 9,150 in 1996 to 20,340 in 2000 (U.S. Immigration and Naturalization Service 2001). In 2001, estimates of undocumented migrant traffic reached 1,000 per night in Organ Pipe Cactus NM alone (NPS 2001), and 150,000 for the year (Milstead and Barns 2002). Numbers of illegal crossings through the BMGR increased in the mid to late 1990s after Border Patrol stepped up their presence in border cities. Apprehensions in the BMGR by Border Patrol were 9,500, 11,202, and 8,704 in 1996, 2000, and 2001, respectively (MCAS Yuma 2003). These illegal crossing and law enforcement response have resulted in route proliferation, off-highway vehicle (OHV) activity, increased human presence in backcountry areas, discarded trash, and vehicles abandoned by smugglers. Habitat degradation and disturbance of pronghorn almost certainly results from these illegal activities. Increased illegal activities have precipitated increased law enforcement presence, with additional associated adverse effects. However, without Border Patrol efforts, the impacts from undocumented immigrants would be even greater. Some discussions are occurring between Mexican and U.S. officials about the creation of a guest worker program whereby Mexican nationals could legally cross the border to work in the U.S. If such a program was initiated, it might greatly reduce illegal immigration and law enforcement response, with concomitant reductions in habitat degradation and suspected disturbance of pronghorn that have increased so dramatically in recent years.

#### **E. Past and Ongoing Federal Actions in the Action Area**

Because of the extent of Federal lands in the action area, most activities that currently, or have recently, affected pronghorn 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, the Service, BLM, Organ Pipe Cactus NM, and Border Patrol.

Resource management on and near the BMGR is coordinated through the Barry M. Goldwater Executive Council (BEC), a group of Federal and state agency representatives with statutory authority and management responsibility for the BMGR, its resources, and adjacent Federal lands. Formalized in March 1998, the BEC provides a conduit for communication regarding resource management issues, conflicts, and planning on the BMGR. Membership on the council includes representatives from Luke Air Force Base, MCAS-Yuma, the Phoenix and Yuma field offices of BLM, Cabeza Prieta NWR and this office, Organ Pipe Cactus NM, Arizona Game and Fish Department, and Tucson and Yuma sectors of the Border Patrol. No single agency serves as the council lead and the organization operates on a consensus basis. One subcommittee of the BEC is dedicated to Sonoran pronghorn. The MLWA of 1999 called for the establishment of a coordinating committee to act as an advisory group to land management agencies regarding management practices on the BMGR. This committee, the Intergovernmental Executive Committee (IEC), was convened in January 2002 and meets regularly.

Arizona Game and Fish Department, working in cooperation with a number of Federal agencies, has captured and radio-collared a total of 35 adult Sonoran pronghorn since 1994; 22 in 1994, nine in 1997/98, and four in 2000. Five pronghorn captured in 1994 died within 1-33 days post-capture. Three of these mortalities were from unknown causes, while two appeared predator-related (mountain lion and coyote). Since it is unusual to have this many animals die within 40 days post-capture, the direct or indirect effects of capture myopathy, was a suspected factor in their deaths. Capture and handling procedures were immediately modified and no losses related to capture myopathy have occurred in subsequent capture operations. A sixth animal died from a broken neck caused by capture operations in December 2000. Despite these detrimental effects, data collected through radio telemetry are ultimately of great benefit to the conservation of the subspecies. Telemetry data provide information regarding habitat use and requirements, movement patterns, and increase the validity of population estimates. No pronghorn have been captured or telemetered since 2000.

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*

##### Management at Cabeza Prieta NWR

Over 90 percent of Cabeza Prieta NWR was designated by Congress as wilderness in the 1990 Arizona Wilderness Act. To help maintain wilderness character, no vehicular traffic is allowed except on designated public use roads. Vehicles may be parked up to 50 feet from the center of the roads in areas previously used by other vehicles. All other off-road travel is prohibited. Visitors are encouraged to practice a "leave no trace" ethic. Recreational activities on the Cabeza



Prieta NWR include backpacking, hunting, photography, camping, rock climbing, mountain biking, and driving on roads. Before entering, visitors must obtain a valid Refuge Entry Permit and sign a Military Hold Harmless Agreement.

Four-wheel drive vehicles are required on all routes except Charlie Bell Road where 2-wheel drive high-clearance vehicles may be driven. Driving in wet areas is prohibited and visitors are encouraged to not travel during wet conditions due to possible damage to refuge roads. In addition to the prohibitions mentioned above, the following activities are prohibited: dumping of litter, sewage, or liquid waste; firearms, except as authorized in writing by the Cabeza Prieta NWR manager; prospecting, removal, or disturbance of sand, rock, gravel, or minerals; rock hounding; excavating or removing objects of antiquity, cultural artifacts, or paleontological artifacts; trapping; collecting, possessing, molesting, disturbing, injuring, destroying, removal, or transportation of any plant, or animal, or part of the natural flora and fauna on the NWR (exceptions to the above are legally taken game); wood campfires; and unleashed pets.

The management plan for the Cabeza Prieta NWR includes an endangered species management component (U.S. Fish and Wildlife Service 1998b). Activities in this component include the use of remote sensors in coordination with the Border Patrol, an increase in monitoring, forage enhancement plots, a semi-captive breeding facility, and the possibility of the establishment of experimental waters for pronghorn. Specific objectives concerning management goals for the pronghorn were presented in a preliminary draft Comprehensive Conservation Plan (CCP) for the Cabeza Prieta NWR (U.S. Fish and Wildlife Service 1998b) and included coordination with Arizona Game and Fish Department to conduct aerial surveys, weekly telemetry flights, radio-collaring operations, digital vegetation mapping, food plot feasibility studies, installation of water developments with photomonitors to document pronghorn use, telemetry tracking using remote data loggers, and coordination with Mexican authorities on pronghorn populations south of the border. Work continues on the CCP; the draft EIS is expected to be completed in 2003. When the CCP is drafted, we will conduct section 7 consultation on that plan if listed species or critical habitat may be affected. In the interim, we conduct section 7 interagency consultation on individual actions when they are proposed.

Cabeza Prieta NWR provides habitat for the pronghorn and is actively working to conserve the species. However, the presence of humans within pronghorn habitat may constitute a major disturbance factor. Furthermore, human presence may restrict pronghorn access to cover and/or forage and effectively create a barrier to movement.

#### Tucson Sector of the Border Patrol

The Tucson Sector Border Patrol section 7 consultation is not yet complete (consultation number 02-21-99-I-138). We have received three draft BA packages and expect to receive a fourth revised draft in the near future. This consultation encompasses all field activities conducted by the Border Patrol-Tucson Sector, as part of the program to detect, deter, and apprehend undocumented immigrants and drug traffickers. Also included will be the patrol operation, Operation Grip, initiated in 2002 and is continuing in 2003, which is being conducted on the Los

Vidrios Trail and Davidson Canyon areas of the Agua Dulce Mountains on Cabeza Prieta NWR. As part of this operation, trailers, which serve as living quarters for Border Patrol agents, have been placed near Bates Ranch on Organ Pipe Cactus NM. Additionally, we are currently in consultation with Border Patrol on a proposal to place six emergency beacons within pronghorn habitat so that undocumented aliens in distress can call for help. Use of helicopters to respond to emergency call buttons activation on the towers may result in overflights of the proposed semi-captive breeding facility in Childs Valley and are under discussion.

The Tucson Sector is comprised of nine stations. Activities within the Ajo Station have the greatest potential to adversely affect pronghorn. Adverse effects may result from patrol road activities, drag road activities, off-road operations, aircraft overflights, and the use and maintenance of sensors. Furthermore, the potential for disturbance to pronghorn due to human presence may increase in areas where agents live on site (i.e., Operation Grip). Border Patrol activities can be beneficial as well, in that they deter illegal border crossings, foot traffic, and off-road vehicles in pronghorn habitat associated with undocumented aliens and smuggling.

Patrol roads used by Border Patrol agents are typically public or private ranch roads. Although the Border Patrol is not the primary user of these roads, they do have the potential to encounter Sonoran pronghorn during patrols and cause them to flee the area. The Border Patrol monitors tracks of undocumented immigrants on drag roads (dirt roads that are regularly cleared by dragging tires behind a vehicle and then monitored for human tracks). Less than 10 miles of drag roads are used by the Ajo Station. Pronghorn appear to have an affinity for drag roads as the process of preparing the roads promotes forb growth (J. Hervert, pers. comm. 1999). Additionally, these roads may be utilized by pronghorn as bedding areas due to greater predator detection resulting from increased visibility (J. Hervert, pers. comm. 1999). Pronghorn attracted to these areas may be adversely affected by the presence of patrols and road preparation activities. Sensors are placed at strategic locations along the U.S.-Mexico border on established roads or trails within known travel corridors to detect illegal activities. The Ajo Station uses and maintains approximately 85-90 sensors during daily operations. Sensor installation and/or maintenance activities could disturb pronghorn if they are in the immediate area. However, these disturbances should be infrequent and short in duration.

Off-road activities include agents on foot, the use of OHVs, including four-wheel drive vehicles, dirt bikes, and all-terrain vehicles. These activities may disturb pronghorn and disrupt normal behavioral activities. Motorized off-road activities also degrade pronghorn habitat. In addition to off-road activities, one routine helicopter patrol route is flown from Why along a southwesterly route to the Agua Dulce Mountains. Additional helicopter activities may occur throughout the range of the pronghorn, and helicopters may hover and land. Areas where low-level helicopters are used have the highest potential for serious disturbance to pronghorn, such as near the breeding facility in Childs Valley. Evidence from other subspecies of pronghorn and other ungulates suggests that pronghorn may exhibit elevated heart rates, may flee, and could alter habitat use in response to low-level helicopter flights (Workman *et al.* 1992).

Yuma Sector Border Patrol Beacon Stations

After initiating emergency consultation, the Yuma Sector Border Patrol installed six emergency beacon stations (panic buttons) on the BMGR as a means to reduce mortality of illegal immigrants. The installation of the stations resulted in little habitat disturbance; however, the presence of the electronic stations may increase human presence in these areas (undocumented immigrants, and maintenance and rescue crews) and therefore represents an additional disturbance factor for pronghorns. To date, the beacon stations have been activated several times. The Yuma Sector also placed a temporary trailer at Christmas Pass on Cabeza Prieta NWR, just west of the current pronghorn distribution. In 2003, the Yuma Sector is proposing to move that trailer to the Pinta Sands area on the El Camino and discussions are currently underway with the Service. Yuma Sector Border Patrol has requested reinitiation of consultation on their ongoing activities, including the operation and maintenance of these beacons. We expect to complete a biological opinion by the end of September 2003.

Smuggler/Drug Interdiction

We are aware of U.S. Customs, Drug Enforcement Authority, and Arizona Army National Guard smuggler or drug interdiction activities in pronghorn habitat, including vehicle and helicopter activities. However, none of these agencies have provided information to us about the extent or types of activities they conduct, and no consultation has occurred on these activities. ARNG is not a proponent of these Federal actions, but will cooperate with the lead Federal agency if requested to do so. These activities are not part of the WAATS project. Due to a lack of information, we cannot evaluate the extent to which these activities may affect Sonoran pronghorn or their habitats. However, vehicles and low-level helicopter flights can cause pronghorn to run, which can have adverse physiological effects, particularly when the animals are stressed, such as during drought (see Effects of the Proposed Action).

*Federal Actions Addressed in Section 7 Consultations*

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

Four opinions addressed projects with minor effects to the pronghorn. Two opinions (consultation numbers 02-21-83-F-0026 and 02-21-88-F-006) covered capture and collaring of pronghorn for research purposes, with no incidental take of pronghorn anticipated. Consultation number 02-21-88-F-0081 involved installation of a water source in the Mohawk Valley for pronghorn, with no incidental take anticipated. Consultation number 02-21-89-F-008 addressed change in aircraft use by Luke Air Force Base on the BMGR, including change in aircraft type from the F-15A/B to the F-15E, and an increase in nocturnal flights (F-15E Beddown Project). We anticipated take of pronghorn in the form of harassment as a result of aircraft overflights. Reasonable and prudent measures to minimize take included: 1) development of long-term studies to determine the effects of overflights on the pronghorn, 2) if effects of overflights are

identified, Luke Air Force Base would work with us to eliminate them, and 3) work involving pronghorn would be carried out in accordance with appropriate state and Federal permits. This project was later incorporated into the biological opinion on Luke Air Force Base' activities on the BMGR, discussed below. Intra-Service consultation for recent emergency conservation activities conducted by Cabeza Prieta NWR and AGFD, including water tanks, forage enhancement plots, and the proposed semi-captive breeding facility, concluded that no incidental take of pronghorn was anticipated. No incidental take is known to have occurred as a result of these emergency actions.

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

Border Patrol Activities in the Yuma Sector, Wellton Station, Yuma, Arizona

This biological opinion (consultation number 02-21-96-F-0334), issued September 5, 2000, addressed all Border Patrol activities along the United States/Mexico border in Yuma County from the Colorado River to about the area of Pinta Sands at the south end of the Sierra Pinta Mountains. The Yuma Sector has requested reinitiation of consultation; we expect a revised opinion will be produced by the end of 2003. Border Patrol activities within the Yuma Sector/Wellton Station included helicopter and ground patrols; drag road preparation and assessment of road maintenance; remote sensor installation and maintenance; apprehensions and rescues; and assistance to other sectors and agencies. To reduce adverse effects on pronghorn, the Border Patrol agreed to implement the following measures: 1) purchase new, quieter MD600N helicopters to replace existing OH-06As; 2) contact the Arizona Game and Fish Department weekly for an update on weekend telemetry flights to avoid areas of pronghorn concentration; 3) modify helicopter flights to avoid fawning areas during the three peak months of the fawning season (April-June); 4) make confidential monthly reports to the manager of Cabeza Prieta NWR detailing the law enforcement actions and wildlife observations made during the previous month; 5) finalize the Memorandum of Understanding between the Border Patrol and Cabeza Prieta NWR to address objectives that will minimize potential conflicts including limiting routine patrols and off-road use in wilderness and providing a framework for cooperation; and 6) conduct an annual interagency meeting with Cabeza Prieta NWR, this office, and BLM to present the annual report and discuss ways to improve coordination.

Disturbance to pronghorn was anticipated as a result of on-the-ground Border Patrol operations, and direct injury or mortality of pronghorn as a result of collision with Border Patrol vehicles or by low-level helicopter flights abruptly approaching and startling pronghorn, which may result in injury or energetic stress, particularly during drought. Pronghorn may also be adversely affected by noise and visual impacts of helicopter overflights. The increased energy expenditure caused by sudden or loud noises may lead to lower reproductive output and/or survival. The potential for detrimental effects to pronghorn may be greatest during the peak months of the fawning season (April-June). Habitat disturbance due to off-road vehicle travel would also result. During reinitiation of this consultation in 2003, we intend to ensure that helicopter flights do not occur over or near the semi-captive breeding facility, which should be completed in late 2003.

We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. We anticipated take in the form of harassment that is likely to injure up to one pronghorn in 10 years. The following reasonable and prudent measures were provided: 1) minimize injury of pronghorn; 2) monitor and study reactions of pronghorn on BMGR to Border Patrol activities; and 3) provide a means to determine the level of incidental take that results from Border Patrol activities. Several conservation recommendations were also provided.

The Border Patrol submitted an annual report of their activities in 2001, in which they stated that they were in the process of implementing the reasonable and prudent measures, terms and conditions, and conservation recommendations that were part of the proposed action. They have not replaced the OH-06A helicopters with quieter models, as they agreed to during consultation in 2000; however, they are investigating other single turbine helicopters with low noise profiles. We are not aware of any incidental take attributable to Border Patrol activities in the Yuma Sector's Wellton Station resulting from the proposed action.

#### BLM's Lower Gila South Management Area

Three biological opinions address BLM's Lower Gila South Management Area. The Lower Gila South Resource Management Plan-Goldwater Amendment (consultation number 2-21-90-F-042), proposed specific and general management guidance for non-military activities on the BMGR. Of particular importance for pronghorn was proposed management of recreation. Use of the BMGR is by permit only. The number of BMGR recreational use permits issued by the BLM field offices increased dramatically in the late 1990s, with a total of 893, 2545, and 3528 permits issued in 1998, 1999, and 2000, respectively. Permits are also issued by the USAF, Marine Corps, and Cabeza Prieta NWR. Permits are valid for any part of the BMGR that is open to public recreation. The presence of an increasing number of humans creates a disturbance risk to pronghorns, and OHVs may constitute a mortality factor. The OHV roads and heavily used vehicle-camping areas degrade habitat and may disturb pronghorn, as well as create barriers to pronghorn movement. No incidental take was anticipated. The non-jeopardy biological opinion, issued April 25, 1990, was programmatic, requiring BLM to consult when site-specific projects are proposed. To date, no site-specific formal consultations have been conducted. In November 2001, BLM's management of the range ceased and will be replaced by the BMGR INRMP (see section entitled "Recreation, Natural Resources, and Cultural Resources Management" herein).

The Lower Gila South Habitat Management Plan (HMP) (consultation number 02-21-89-F-0213) provided management guidance for both specific and general actions in southwestern Arizona. Four actions were addressed in the HMP, including an exchange of 640 acres near Ajo, rehabilitation work on two catchments, and assessment of livestock removal from pronghorn habitat. Exchange of land out of public ownership may facilitate development or other uses that would preclude use by pronghorn. No incidental take was anticipated. The non-jeopardy opinion was issued on May 15, 1990.

The biological opinion for the Lower Gila South Resource Management Plan and Amendment (consultation number 02-21-85-F-0069) addressed programmatic management of lands in

southwestern Arizona, including livestock grazing, wilderness, cultural resources, fire, minerals and energy, recreation, wildlife management, wood cutting, Areas of Critical Environmental Concern, and other land uses. The biological opinion concluded that OHV restrictions and designations of Areas of Critical Environmental Concern would benefit pronghorn, but wood cutting, recreation, grazing activities, mining, and designation of utility corridors would adversely affect pronghorn. Incidental take of the pronghorn was anticipated, but not quantified. Any decline of forage quality or increase in the amount of fencing was judged to indicate that incidental take had been exceeded. Reasonable and prudent measures and terms and conditions to minimize take included: 1) modifying grazing allotment fences to allow passage of pronghorn, 2) improving habitat conditions for the pronghorn, and 3) minimizing human disturbance. We provided conservation recommendations to monitor pronghorn use of the area, assess pronghorn use at livestock waters, and consolidate lands through land exchanges. The non-jeopardy biological opinion was issued on March 27, 1998. In accordance with the opinion, BLM has monitored livestock grazing, and allotment fences have been modified to allow passage of pronghorn. Enforcement of vehicle and camping regulations has been increased south of Ajo.

In summary, the biological opinions for BLM's Lower Gila South Planning Area anticipated adverse effects to pronghorn and their habitat from livestock grazing, recreation, a land exchange, wood cutting, mining, and designation of utility corridors, resulting in an anticipated unspecified amount of take. We determined that the proposed actions were not likely to jeopardize the continued existence of the pronghorn.

#### Organ Pipe Cactus National Monument - Widen North Puerto Blanco Road

The biological opinion for the Widen North Puerto Blanco Road project (consultation number 02-21-01-F-0109) addressed impacts to pronghorn from the proposed construction of new recreational infrastructure (although consultation on this project is completed, construction has not yet begun due to concerns about the pronghorn). The project was anticipated in concept in the November 16, 2001, opinion on Organ Pipe Cactus NM's General Management Plan, but it was recognized at the time that project-specific consultation would be needed. The project would widen the first 5.1 miles of North Puerto Blanco Road to allow for two-way travel, construct a vehicle turn-around, construct four interpretive pullouts with educational kiosks, and construct a parking area with picnic tables, a restroom facility, and educational kiosks at the terminus of the two-way segment. North Puerto Blanco Road would be widened from 14 feet to 20 feet, concrete low-water crossings would be installed in washes, and some steeper portions of the road would be paved for safety and erosion control.

The project is expected to result in effects to pronghorn from 11 acres of habitat loss, increased disturbance from recreational activities, and movement barrier effects from increased use of the road and recreational activities. Use of the new two-way road, pullouts, and terminus facility may curtail the movements of pronghorn into the area, effectively barring the species from a portion of their range. These effects are expected to be offset by Organ Pipe Cactus NM's program of annual road and backcountry closures and by delaying construction until the

pronghorn's status has improved. Closing these facilities during the crucial fawning and summer dry seasons should largely eliminate these effects during periods when pronghorn are most likely to be in the monument and need access to these areas.

Organ Pipe Cactus NM proposed the following conservation measures to minimize effects to pronghorn: 1) institute a monitoring program such that any pronghorn detected in Organ Pipe Cactus NM will result in a 5-mile diameter buffer zone around the animal which will be closed to all activity, except for a minimal amount of administrative traffic; 2) limit backcountry permits to areas east of SR 85 and south of North Puerto Blanco Drive from March 15 to July 15; 3) close North Puerto Blanco Drive annually to public use from March 31 to July 15, and close the Bates Well Road and Pozo Nuevo Road to public use from March 15 to July 15; 4) continue to place temporary waters in backcountry areas during the dry season for pronghorn; 5) delay timing of construction of the project until after the fawning and summer dry seasons (March 15-July 15); and 6) construction will also be delayed until significant rainfall occurs and most pronghorn move out of the Monument to other areas of their range. We determined that the project was not likely to jeopardize the continued existence of the pronghorn. The non-jeopardy biological opinion was issued October 29, 2002. Based on discussions with Park staff, proposed conservation measures are being implemented.

#### SR 85 Roadway and Drainage Improvements Project, Organ Pipe Cactus NM

On May 8, 2003, we issued a biological and conference opinion for the roadway and drainage improvements to SR 85 through Organ Pipe Cactus NM. The action agency was Organ Pipe Cactus NM. The project included placement of a pavement overlay on the existing roadway width (26 feet) for the length of the project (MP 80.50 to MP 57.80), as well as overlay at existing intersections with Organ Pipe Cactus NM crossroads and the Port-of-Entry at Lukeville. Also proposed were a 6-foot-wide roadway shoulder to be built up to match the elevation of the new roadway pavement, replacement of existing ford concrete walls at 24 low-water wash crossings, modification at the Organ Pipe Cactus NM Visitor Center that would combine the entrance and exit at the site of the existing exit, as well as the construction of right and left turn lanes and a southbound acceleration lane to serve the new entrance/exit, construction of two interpretive waysides for use by motorists, including visitors to Organ Pipe Cactus NM, construction of a concrete box culvert in Cherioni Wash (MP 70.29) to eliminate the existing dip-crossing, and other roadway improvements associated with these features. Included in the proposed action were a number of conservation measures to minimize effects to listed species. These included: salvage of vegetation and revegetation of 8.27 acres, installation of gates on the two SR 85 waysides so they can be closed to public use during the pronghorn fawning period (March 15 - July 15), vegetation clearing adjacent to SR 85 for visibility, a literature review of pronghorn-road interactions and recommendations for reducing the likelihood of pronghorn road mortality or injury, placement of temporary water sources in key areas at critical times for pronghorn, a monitoring program to assess effectiveness of temporary waters, continuation of participation in and financial support of the pronghorn emergency recovery projects, an annual report of pronghorn conservation efforts addressing annual progress for each of the measures

listed here and in other current biological opinions on the pronghorn, contribution to the 51 recovery projects identified by the Sonoran pronghorn recovery team, timing of construction to avoid the pronghorn breeding season, and coordination with us and the Arizona Game and Fish Department to determine pronghorn presence in the Monument prior to construction. NPS will only begin construction after receiving written authorization from us to proceed, based on pronghorn telemetry or overflight survey information (note - no pronghorn are currently telemetered).

We concluded that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn. No take of pronghorn was anticipated. We included three conservation recommendations for pronghorn.

### *5 Remanded Biological Opinions*

In response to *Defenders of Wildlife, et. al., v. Bruce Babbitt, et. al.* (Civil Action No. 99-927 [ESH]), Judge Ellen Huvelle of the United States District Court (Court) for the District of Columbia issued a Memorandum Opinion and Order on February 12, 2001. The Court found that we failed to address the impact of various Federal actions on the Sonoran pronghorn when added to the environmental baseline and failed to include in the environmental baseline the impacts of all Federal activities in the area that may affect, directly or indirectly, the pronghorn.

The Court ordered us to produce, in consultation with the defendants, revisions of the following biological opinions: Luke Air Force Base (August 1997), Army National Guard (ARNG) (September 1997), BLM (December 1997), MCAS-Yuma (April 1996), and Organ Pipe Cactus NM (June 1997). The Court further ordered that we, in consultation with the Federal agencies whose biological opinions have been remanded, must reconsider those portions of the opinions that have been found to be contrary to the dictates of the Act. This included the scope of the action area, analysis of the environmental baseline, and analysis of the effects of incidental take in context with a revised environmental baseline. The remanded biological opinions were issued on November 16, 2001. A reinitiated opinion on the BLM's grazing allotments was completed in September 2002. In the following discussion, we describe both the original and remanded/reinitiated opinions for these five consultations.

#### BLM grazing allotments in the vicinity of Ajo, Arizona

The original biological opinion (consultation number 02-21-94-F-0192), issued December 3, 1997, addressed effects to pronghorn resulting from issuance of grazing permits on five allotments, four of which are located near Ajo and Why (Cameron, Childs, Coyote Flat, and Why allotments); and the fifth near Sentinel (Sentinel allotment). All but portions of allotments east of Highway 85 were considered to be within the current distribution of the Sonoran pronghorn. According to the BLM, livestock use of the five allotments had been relatively low in the previous ten years; however, the effects of stocking the allotments at any level had not been analyzed. Monitoring of the Coyote Flat and Why allotments had not occurred. The BLM permittees had not fully stocked the Cameron, Why, Sentinel, and Childs allotments for a



sustained period of time. The Coyote Flat Allotment had been billed for full stocking. According to the BLM, monitoring data had not shown overutilization of the vegetation or a change in vegetation composition. The BLM estimated that if allotments were stocked at permitted levels, forage utilization rates could approach 40 percent. Preliminary data from the BLM and the Arizona Game and Fish Department showed that there is little dietary overlap between pronghorn and cattle. Because of this, the amount of forage on allotments, and the likely utilization levels, we found that adequate forage for the pronghorn should be available. Maintenance of livestock waters, fences, and other improvements may temporarily disrupt pronghorn activity. Pronghorn may also become entangled in livestock fences.

We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. Incidental take of one pronghorn was anticipated to occur in the form of harassment or death due to grazing management activities during the 15-year proposed action. The following reasonable and prudent measures were provided to minimize take of pronghorn: 1) minimize impacts to pronghorn from grazing and 2) minimize habitat loss, degradation, and fragmentation of pronghorn habitat. The opinion included the following conservation recommendations: develop allotment management plans for each allotment and monitor pronghorn use within Cameron, Coyote Flat, Sentinel, and Why allotments.

The 1997 biological opinion was remanded to us by the Court on February 12, 2001. A final biological opinion was issued on November 16, 2001. The Federal action considered in that opinion was the issuance of a 10-year grazing permit on the five allotments. However, because the BLM agreed to finalize their Rangeland Health Allotment Evaluations conducted during 2001, and to then reinitiate consultation regarding the continued grazing of these allotments, the 2001 biological opinion analyzed the effects of the proposed action only for the interim period. In this biological opinion we concluded that grazing activities within the interim period would not jeopardize the continued existence of the Sonoran pronghorn. Further, we concluded that these actions would not result in take of Sonoran pronghorn. The opinion included a number of g conservation recommendations, as well.

The BLM reinitiated consultation on the Ajo allotments on April 23, 2002. The proposed action was the re-issuance of 10-year grazing permits on the five allotments addressed in previous opinions. The BLM included a number of very comprehensive conservation measures to be implemented according to a prioritized schedule. These measures included: 1) BLM will only authorize ephemeral grazing on the Cameron, Coyote Flats, Childs, and Why allotments in accordance with ephemeral use criteria in their Arizona Rangelands Standards and Guidelines and if both of the following conditions are met: a) In years where ephemeral plant production is geographically limited, ephemeral forage on the Ajo allotments is not an important part of ephemeral forage available to pronghorn, either in terms of forage quality or acreage of green-up, and b) the U.S. pronghorn population must be above 100 and increasing; 2) BLM will implement a forage enhancement project on the Cameron Allotment starting in fiscal year 2004, 3) BLM will develop a “drought policy” for the 5 allotments to more consistently guide authorization of grazing use in Sonoran pronghorn range when drought situations occur, 4) BLM

will install ground-level drinking troughs for use by pronghorn, outside of the corrals, on 3 livestock wells in the Cameron Allotment, 5) During 2004-2006, BLM will install lay-down fences along portions of the southwestern boundaries of the Cameron Allotment to allow unimpeded passage of pronghorn. These portions of the fence will be laid down, beginning on May 1 of each year, with the reinstallation process to begin no sooner than August 31 and to be completed by September 15 of each year, 6) BLM will construct a fence to contain livestock in the northern part of the Cameron Allotment from May 1 to September 15 of each year, 7) BLM will provide this office with full descriptions, including photographs and diagrams, of all existing livestock water sources within the allotments west of SR 85. Based on the results of the study described below in 8, BLM will work with us to determine any necessary modifications to each water source to a) reduce the potential of the source to provide breeding habitat for biting midges (may require restricting access to some sources through fencing or breaching dams and allowing the sources to dry); b) provide safe access for Sonoran pronghorn; and c) ensure that such modifications do not result in adverse effects to other listed species in the vicinity (e.g., cactus ferruginous pygmy-owls may use the more vegetated water sources), and 8) BLM will initiate or cooperate in development of a study of the potential for disease transmission from livestock to pronghorn in the Ajo Allotments.

In the September 30, 2002, opinion, we concluded that the proposed action is not likely to jeopardize the continued existence of the pronghorn. This conclusion was based in part on full and prompt implementation of the conservation measures. To date, BLM has prohibited ephemeral grazing, developed a drought policy, surveyed fence lines, purchased some fencing materials, inventoried water sources west of SR 85, funded a pilot disease study, implemented seasonal route closures, contributed \$15,000 towards survey and monitoring efforts, and made other progress in implementing the conservation measures. BLM's conservation measures would also eliminate any potential for take of pronghorn from the project. Four conservation recommendations were included in the opinion.

Thus far, compliance with the conservation measures has been good. BLM was to submit annual reports to us on implementation of their action, including the conservation measures. The first report was received in March 2003. Consistent with the opinion, a report inventorying all livestock waters on the allotments west of SR 85 (measure 7) was received by us in November 2002, and BLM initiated a study of disease transmission in the Ajo allotments with Arizona Game and Fish Department in 2003 (measure 8).

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

Consultation began on the Arizona portion of the YTRC in 1995. The original biological opinion (consultation number 02-21-95-F-0114), issued on April 17, 1996, addressed all proposed and authorized actions on the BMGR by MCAS-Yuma, including proposed changes to military flights over Cabeza Prieta NWR, ongoing flights over BMGR, and operation of various training facilities such as landing strips, a rifle range, targets, a parachute drop zone, a

transmitter/telemetry system, and ground support areas. MCAS-Yuma conducts WTI courses twice a year (March-April and October-November - see Description of the Proposed Action).

Ground-based activities, such as those of troops and vehicles at ground-support areas were likely to adversely affect pronghorn habitat use. Over the entire project area, ground-support areas in potentially occupied pronghorn habitat would encompass approximately 32.4 mi<sup>2</sup>. Numerous pronghorn have been located in recent years in R-2301W on the BMGR and the Cabeza Prieta NWR east of the Baker Peaks, Copper, and Cabeza Prieta mountains. In this area, ongoing and proposed military ground-based activities have the greatest potential for adversely affecting pronghorn. Military overflights do not cause habitat degradation, but pronghorn may respond with increased heart rates and flee from aircraft, particularly low-level helicopters. The increased energy expenditure associated with flight behavior may lead to lower reproductive output and/or survival. Additionally, pronghorn may avoid flight paths, which may result in an indirect loss of useable habitat. In areas where helicopters fly particularly low and create more noise and greater visual stimuli, disturbance to pronghorn would be expected to be greater. Ordnance delivery may also adversely affect pronghorn. Pronghorn use both the North and South TACs, and ordnance, live fire, and shrapnel could potentially strike and kill or injure a pronghorn. Furthermore, pronghorn could be killed or injured during an encounter with unexploded live ordnance on the ground. MCAS-Yuma proposed measures to reduce the direct and indirect impacts of the proposed action, including measures to reduce or eliminate take of Sonoran pronghorn and to minimize destruction and degradation of habitat.

We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. Incidental take of one pronghorn per 10 years was anticipated in the form of direct mortality, and undetermined numbers of pronghorn were anticipated to be taken in the form of harassment by low-level fixed wing and helicopter flights, military vehicles, or other activities authorized, funded, or carried out by MCAS-Yuma. The following reasonable and prudent measures were provided to minimize take of pronghorn: 1) MCAS-Yuma will develop personnel and visitors educational/information programs and operational procedures; 2) to the extent practicable, military activities shall be located outside of pronghorn habitat; and 3) incidental take resulting from the proposed action will be monitored and reported to us. Three conservation recommendations were included in the opinion, as well.

In 1999, MCAS reported that no pronghorn habitat was modified, Range Management received no reports of Sonoran pronghorn encounters, and all air and ground crews were briefed on the requirements of the opinion. We are not aware of any incidental take of pronghorn attributable to MCAS-Yuma YTRC activities. On March 18, 1998, an amendment was requested on the consultation by MCAS-Yuma. This request slightly changed the description of the equipment and personnel to be used in the Stoval Field exercise area. We determined that the changes would have no additional effects not already anticipated in the biological opinion.

The 1996 biological opinion was remanded to us by the Court on February 12, 2001. During consultation, MCAS-Yuma proposed 26 conservation measures aimed at the reduction of adverse effects of the proposed action on the environment, including impacts to the Sonoran pronghorn

(Dames and Moore 1995; MCAS -Yuma 1995, 1997, 2001; letter from MCAS-Yuma to us dated October 15, 2001). We concluded that the proposed action would not jeopardize the continued existence of the Sonoran pronghorn. Further, we anticipated that no more than six Sonoran pronghorn would be incidentally taken as a result of the proposed action. The incidental take was expected to be in the form of harassment. This incidental take provision will be reviewed concurrent with subsequent reviews of the BMGR INRMP, which will occur every five years. The following reasonable and prudent measure was provided to minimize take of pronghorn: MCAS-Yuma shall modify low-level helicopter use to avoid areas of significant pronghorn use to minimize adverse effects from helicopters on the pronghorn and its habitat, particularly areas important for fawns and their mothers. The opinion included several conservation recommendations, as well. We issued the final remanded biological opinion on November 16, 2001.

Judge Huvelle again ordered revisions to the opinion in 2003. MCAS-Yuma revised their biological assessment, which included 20 conservation measures for the pronghorn. In the August 6, 2003, opinion, we found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn. No incidental take was anticipated.

#### Organ Pipe Cactus NM General Management Plan

The biological opinion (consultation number 02-21-89-F-0078), issued June 26, 1997, addressed implementation of Organ Pipe Cactus NM's GMP. The purpose of the GMP is to guide management for the next 10-15 years. Plan elements included: 1) working with Arizona Department of Transportation to ensure continued travel and commerce on SR 85 while enhancing resource protection, 2) seeking designation of Organ Pipe Cactus NM as the Sonoran Desert National Park, 3) establishment of partnerships to share facilities, staff, and costs in Why and Lukeville, 4) increased wilderness and development of an interagency wilderness and backcountry management plan, 5) changes in trails at Quitobaquito, 6) changes in facilities in the Twin Peaks area, 7) increased primitive camping and designated trails, and 8) full implementation of the Organ Pipe Cactus NM Cultural Resources Management Plan.

To reduce adverse effects on pronghorn, Organ Pipe Cactus NM proposed the following: 1) pursue an agreement with Arizona Department of Transportation to establish a vehicle for continued communication regarding road-related issues, construct underpasses at known movement corridors to facilitate safe passage of pronghorn under the highway, and establish a program to explore other measures to better understand and subsequently reduce the impacts of SR 85 on pronghorn; 2) continue working with the Arizona Department of Public Safety to enforce the existing speed limit within Organ Pipe Cactus NM; 3) convert the bottom strands of Organ Pipe Cactus NM's north and south boundary fences to smooth wire to encourage pronghorn movements between Organ Pipe Cactus NM and surrounding areas; 4) educate motorists about the plight of pronghorn using a variety of interpretive media in an effort to encourage lower speeds and increased awareness of wildlife use of the highway corridor; 5) continue to serve as a member of the Interagency Core Working Group for Sonoran pronghorn recovery and implement activities outlined in the recovery plan, including development of a

monitoring program; and 6) monitor visitor use and restrict access where necessary to minimize the potential for disturbance to pronghorn.

Recreational activities at Organ Pipe Cactus NM include hiking, camping, horse-back riding, and biking. These activities can disturb pronghorn and degrade habitat. Maintaining and/or adding hiking trails at Organ Pipe Cactus NM is likely to maintain or increase visitor presence in pronghorn habitat, resulting in disturbance to pronghorns. All proposed facilities would be located within areas of existing development and would involve relatively small tracts of land surrounded by larger areas of undisturbed habitat. However, development of facilities that result in increased visitor use may adversely affect the pronghorn. Increased use of some frontcountry and backcountry areas has the potential to adversely affect pronghorn if it causes an alteration in behavior or habitat use. Increased visitation to Organ Pipe Cactus NM was also expected to result in increased traffic along SR 85, adding to the barrier effect of existing traffic patterns. Approximately 22 miles of SR 85 lie within Organ Pipe Cactus NM. We concluded that the highway is a deterrent to expanding pronghorn populations, and resulting modified behavioral patterns may lead to a reduction in genetic exchange and viability, and therefore a reduction in the ability of pronghorn to adapt to environmental change.

We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. Incidental take in the form of injury or death to one pronghorn associated with traffic on SR 85 was anticipated. The following reasonable and prudent measures were provided to minimize take of pronghorn: 1) work with agencies to implement actions to reduce effects of current and future traffic patterns on SR 85; 2) modify fences for pronghorns; 3) educate motorists on pronghorn vulnerability to traffic; and 4) monitor use and restrict access where necessary to minimize pronghorn disturbance. One conservation recommendation was included in the opinion. No incidental take of pronghorn associated with the proposed action has been documented.

The 1997 biological opinion was remanded to us by the Court on February 12, 2001. The GMP had changed since the 1997 plan was released, most notably with regard to projects that were ongoing or had been completed, and the addition of new projects. To reduce adverse effects, Organ Pipe Cactus NM included 14 conservation measures for Sonoran pronghorn in its proposed action: 1) closing Pozo Nuevo Road to public use at its intersection with Puerto Blanco Drive from March 15 to July 15; 2) closing Bates Well Road to public use at the northern monument boundary from March 15 to July 15; 3) closing North Puerto Blanco Drive at a point approximately 5.1 miles from the Visitor's Center, and also at its intersection with Pozo Nuevo Road from April 1 to July 15; 4) implementing a pronghorn monitoring program and closing areas within a 5 mile diameter of known pronghorn locations, specifically targeting Puerto Blanco Road for potential closure between March 1 and March 31; 5) restricting backcountry use, from March 15 to July 15, to areas east of SR 85 and south of North Puerto Blanco Drive; 6) limiting future development to the area south of North Puerto Blanco Drive and east of Senita Basin Road/Baker Mine Trail/Dripping Springs Mine Trail and limiting timing of construction to occur outside the pronghorn fawning and summer dry seasons (March 15 to July 15); 7)

establishing a 3-year experimental pronghorn crossing zone on SR 85 from milepost 67 to 71, consisting of a temporary speed limit reduction to 35 - 45 mph from 0400 - 0900 hours seasonally, including a monitoring program to assess effectiveness; 8) removing the north boundary fence if BLM agrees to remove livestock from the Cameron and Coyote Flat allotments for a period of at least 20 years, including at least a 2 year advance notice of BLM's intention to return livestock to these areas; 9) placing temporary water sources in key areas, primarily during the dry season, and including a monitoring program to assess effectiveness of temporary waters; 10) continuing to support pronghorn radiotelemetry (if animals are again, radio collared); 11) implementing erosion control measures utilizing a hydrologist/sedimentologist; 12) maintaining and expanding a non-native species removal program including removal of buffleggrass and Sahara mustard; 13) providing an annual report of pronghorn conservation efforts; and 14) contributing to the 51 recovery projects identified by the Sonoran pronghorn recovery team (Appendix 1 of the 2001 opinion) within National Park Service regulations, either by providing in-kind contributions or by commitment of funds. Consequently, we did not anticipate any incidental take of Sonoran pronghorn as a result of the proposed action. A number of conservation recommendations were included in the opinion.

The November 16, 2001, opinion was remanded for further revision to us by court order, dated January 7, 2003. The April 7, 2003, opinion came to the same conclusion on the pronghorn as the November 2001, opinion (i.e., the proposed action was not likely to jeopardize the continued existence of the pronghorn, and no incidental take of pronghorn was anticipated). Organ Pipe Cactus NM made some changes in the conservation measures after finalization of the opinion. An addendum to the opinion was issued by this office on June 11, 2003, clarifying the changes and stating that they did not alter our previous findings in the April 7, 2003, opinion.

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

The biological opinion (consultation number 02-21-96-F-0094), issued August 27, 1997, addressed military use of the airspace above and the ground space on BMGR-East by Luke Air Force Base. At the time of the consultation, about two-thirds of the BMGR was located on lands managed by the DoD and BLM, with the remaining third located within Cabeza Prieta NWR. Approximately 5 percent (7.6 percent, if not including Cabeza Prieta NWR) of the range had been impacted by military activities. Military activities within the area of overlap with the Cabeza Prieta NWR were limited to use of airspace and operation of four Air Combat Maneuvering Instrumentation sites. Military activities occurring within BMGR-East were managed by Luke Air Force Base and include: airspace use, four manned air-to-ground ranges, three tactical air-to-ground target areas, four auxiliary airfields, Stoval Airfield, and explosive ordnance disposal/burn areas. Primary potential effects of the action included habitat loss due to ground-based activities, harassment and possible mortality of pronghorn at target areas, and disturbance of pronghorn due to military overflights.

We determined that the proposed action was not likely to jeopardize the continued existence of the pronghorn. During each 10-year period of the project, take was anticipated in the form of harassment that was likely to injure up to two pronghorn and in the form of death of at least one

pronghorn. The following reasonable and prudent measures were provided to minimize take: 1) minimize impacts of activities on pronghorn; 2) minimize habitat loss, degradation, and fragmentation of pronghorn habitat; 3) monitor and study reactions of pronghorn on the BMGR to military activities; and 4) determine the level of incidental take that results from the project. Three conservation recommendations were provided in the opinion.

Implementation of the reasonable and prudent measures have been documented in their annual reports. We are not aware of any take of pronghorn confirmed attributable to Luke Air Force Base use of the ground-surface and airspace on the BMGR. A pronghorn found dead near a target may have been strafed, but it may also have died from other causes (see “Effects of the Proposed Action” herein for a full discussion of this incident).

The 1997 biological opinion was remanded to us by the Court on February 12, 2001. During the development of this revised opinion, Luke Air Force Base made substantial commitments to minimize the effects of their activities on the Sonoran pronghorn, and additionally committed to implementing a variety of recovery projects recommended by the Sonoran pronghorn Recovery Team. A total of 12 conservation measures were added to the proposed action. In a November 16, 2001, biological opinion, we concluded that the proposed action, including conservation measures, is not likely to jeopardize the continued existence of the Sonoran pronghorn. We further anticipated that no more than three Sonoran pronghorn would be incidentally taken as a result of the proposed action. The incidental take was expected to be one pronghorn in the form of death and two pronghorn in the form of harassment. The incidental take provision will be reviewed concurrent with subsequent reviews of the BMGR INRMP, which will occur every five years. To minimize impacts to Sonoran pronghorn, we provided the following reasonable and prudent measure: Luke Air Force Base shall expand efforts to monitor Sonoran pronghorn on the tactical ranges to minimize the likelihood of adverse impacts to the pronghorn from military training exercises. Additionally, several conservation recommendations were suggested..

In the November 16, 2001, biological opinion, one term and condition was provided to implement the reasonable and prudent measure described above. Luke Air Force Base has since completed this term and condition by updating the range operating instructions to reflect the conservation measures in the proposed action. Luke Air Force Base also continues to support the recovery of the Sonoran pronghorn through the biological monitoring contract and management of their previously obligated funds. Also in the opinion, we discussed a number of conservation measures that Luke Air Force Base agreed to add to their proposed action. During FY 2002, Luke Air Force Base did not budget further funds for Sonoran pronghorn management; however, they are assisting Arizona Game and Fish Department in managing the currently obligated funds.

The opinion was remanded again in 2003 with this opinion and the MCAS-Yuma opinion. In the August 6, 2003, opinion, we also found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn. No incidental take was anticipated due to the low

numbers of pronghorn in the U.S. sub-population. Luke Air Force Base recommitted to the conservation measures agreed to in the November 16, 2001, opinion. A number of conservation recommendations were included in the opinion.

#### Western Army National Guard Aviation Training Site Expansion Project

The non-jeopardy biological opinion for WAATS (consultation number 02-21-92-F-0227) was issued on September 19, 1997. The purpose of WAATS is to provide a highly specialized environment to train ARNG personnel in directed individual aviator qualification training in attack helicopters. The WAATS expansion project includes: 1) expansion of the existing Tactical Flight Training Area, which includes establishing four Level III touchdown sites, 2) development of the Master Construction Plan at the Silver Bell Army Heliport, and 3) establishment of a helicopter aerial gunnery range for use by the ARNG on East TAC of the BMGR. East TAC is outside the current range of the pronghorn.

This 1997 biological opinion did not address the pronghorn, but, in the Court's opinion, should have and was therefore remanded by the Court. Per the final EIS for WAATS, ARNG use of East TAC did not cause existing training to shift to North or South TACs because Luke Air Force Base eliminated F-15E training at BMGR, concentrating on F-16 air-to-air and air-to-ground training. Therefore, the EIS did not consider impacts to the pronghorn and none were anticipated. All activities that are part of the proposed action occur outside the current range of the pronghorn, with the exception of training at North TAC. Training at North TAC only occurs when East TAC is closed for annual maintenance and EOD clearances (4-6 weeks each year). Effects to pronghorn at North TAC are minimized by monitoring protocols established by Luke Air Force Base. Training at East TAC could preclude recovery of historical habitat if the many other barriers that prevent pronghorn use of East TAC were removed.

The final remanded biological opinion, issued November 16, 2001, found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn. No incidental take was anticipated. The proposed action included eight conservation measures aimed at the reduction of adverse effects to Sonoran pronghorn and its habitat.

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

Historically, livestock grazing, hunting or poaching, and development along the Gila River and Rio Sonoyta were all probably important factors in the well-documented Sonoran pronghorn range reduction and apparent population decline that occurred early in the 20<sup>th</sup> century. Historical accounts and population estimates suggest pronghorn were never abundant in the 20<sup>th</sup> century, but recently, the estimated size of the population in the action area declined from 179 (1992) to 21 (December 2002). With only 21 animals, genetic diversity is expected to erode, and the sub-population is in imminent danger of extirpation due to human-caused impacts, or natural processes, such as predation or continued drought. Although the proximate cause of the decline during 2002 was drought, human activities limit habitat use options by pronghorn and increase the effects of drought on the sub-population. The U.S. pronghorn sub-population is isolated from



other sub-populations in Sonora by a highway and the U.S./Mexico boundary fence, and access to the greenbelts of the Gila River and Rio Sonoyta, which likely were important sources of water and forage during drought periods, has been severed.

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, increasing presence of undocumented immigrants and smugglers, and in response, increased law enforcement activities. MCAS-Yuma (2001) quantified the extent of the current pronghorn range that is affected by various activities and found the following: recreation covers 69.6 percent of the range, military training on North and South TACs covers 9.8 percent, active air-to-air firing range covers 5.8 percent, proposed EOD five-year clearance areas at North and South TACs and Manned Range 1 cover 1.0 percent, and MCAS-Yuma proposed ground support areas and zones cover 0.29 percent. In addition, livestock grazing occurs over 5.6 percent of the pronghorn's current range (Organ Pipe Cactus NM 2001, Bright *et al.* 2001); a total of 860 miles of roads occur in the current range (MCAS-Yuma 2001)(2,222 miles of roads exist within the BMGR, of which on BMGR-West 368 miles are within the current range of the pronghorn and 464 miles are within the historical range -MCAS Yuma 2003), and foot and vehicle traffic by undocumented immigrants and smugglers occurs at an increasing frequency throughout the area. Organ Pipe Cactus NM (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 4 had unknown effects. Organ Pipe Cactus NM (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."

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

Changes made in the remanded biological opinions in 2001 and 2003, plus the findings in other recent opinions, reduced the amount or extent of incidental take anticipated to occur from Federal actions. In the November 16, 2001, opinion, we found that take would occur in 5 of 13 (the original 12 opinions plus the ARNG opinion that now considers effects on the pronghorn) biological opinions issued up to that point for the Sonoran pronghorn. We now only anticipate take of pronghorn in three opinions: 1) Border Patrol activities in the Yuma Sector, for which incidental take of one pronghorn in the form of harassment was anticipated in 10 years, 2) the Lower Gila South Resource Management Plan and Amendment, in which an undetermined number of pronghorn were anticipated to be taken, and 3) Luke Air Force Base F-15E Beddown

Project. However, we believe that conservation measures agreed to by BLM in the 2002 Ajo allotment grazing opinion largely minimizes or eliminates incidental take resulting from the Lower Gila South Resource Management Plan and Amendment. The Luke Air Force Base's F-15 Beddown Project is completed and we are not aware of any incidental take that occurred as a result of the project. This amount of take is much less than that anticipated in 2001 because we have worked together with the Federal action agencies to minimize the effects of ongoing and proposed activities on the Sonoran pronghorn. In addition, at about 21 animals in the U.S. sub-population, the likelihood of take due to Yuma Sector Border Patrol or BLM activities is now much less than we had anticipated when those opinions were written, because the pronghorn population is much smaller, greatly reducing the likelihood of interactions between pronghorn and these Federal activities (although the effect of any take on the viability of the U.S. sub-population is now much greater, due to small population size). With the exception of likely capture-related deaths during telemetry studies, 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.

## **EFFECTS OF THE PROPOSED ACTION**

### **TFTA (including the Level III sites)**

The increased number of low-level helicopter flights will result in the same type and intensity of existing noise that has occurred since the expansion of WAATS was implemented. The WAATS draft EIS (page 4-26) states that the WAATS "...would map and avoid flying near sensitive receptors..." and "... would also limit flying in certain areas during herd movements, hunting season periods, and other sensitive time periods (as it does with current operations)." The four Level III Sites (Picacho Peak Annex, Samaniego Hills, Silver Bell Annex, and Mercer Ranch) will be used extensively by aircraft and ground personnel, and may require some vegetation clearing to provide sufficient clearance for safe aircraft operations.

The ARNG's BA did not anticipate any impacts to the pronghorn from the TFTA or the Level III sites. The TFTA and the Level III sites are located well east of SR 85, outside the current range of the pronghorn. The Service does not anticipate any direct or indirect effects to the pronghorn from the ARNG activities in the TFTA, including the Level III sites.

### **Master Construction Plan**

The ARNG's BA did not anticipate any impacts to the pronghorn from development associated with the Master Construction Plan. The SBAH site is located 110 miles east of SR 85, outside

the current range of the pronghorn. The Service does not anticipate any direct or indirect effects to the pronghorn from completion of the expansion of the SBAH.

### **Helicopter Operations at East TAC**

Due to the previous use of East TAC by a variety of DoD aircraft, including ARNG helicopters, substantial noise and disturbance levels already existed at the time the WAATS expansion was originally proposed. East TAC is currently active, being used for numerous ongoing training missions for both helicopters and fixed wing aircraft. It is expected that the type and intensity of noise caused by the ARNG's continued helicopter use of East TAC will be essentially the same as the type and intensity that already exists. The expansion of WAATS involves increasing the number of helicopter sorties from 271 per year to 1,320 per year for a total of 6,961 fixed-wing and helicopter sorties on East TAC. Therefore, the same type and intensity of existing noise was expected over more days. The incremental increase associated with noise impacts from the WAATS expansion is increased noise exposure and not increased noise type or intensity.

Bullets, rockets, missiles, and laser lights will be used during training. Nonexplosive ammunition can be used on the target areas. Five helicopter types with various weapon types will be used in this area by ARNG. High explosives are used for missile training in the East TAC area known as HE Hill. Vegetation disturbance within East TAC ranges from minimal in those areas without target sites to complete loss at airfield target sites and HE Hill. The rate of disturbance and deterioration of localized areas around existing target areas increased as a result of the increased number of helicopter training missions. ARNG does not expect additional vegetation impacts from the continued use of East TAC because existing targets and established access roads will be used. East TAC is within the historical range of the pronghorn and is potential recovery habitat. Continued use of the area by the military precludes habitat regeneration and could prevent pronghorn dispersal into that area if the other barriers (e.g., SR 85) to accessing and using that area were removed.

### **Helicopter Operations at North and South TACs**

Projected numbers of helicopter sorties into North and South TACs are found in Table 2 (see column “% ARNG Sorties Off East TAC”). Number of sorties into North and South TACs would vary from zero in 2003 and 2004 to 600 in 2010. The average annual projected number of sorties from 2003-2010 is 112. Helicopters would fly to North and South TACs from the Gila Bend Auxiliary Air Field at elevations below 500 feet AGL or between 500 and 1,200 feet AGL. Helicopters would hover, simulating target acquisition, in target areas of North and South TACs. About 20 percent of sorties would occur at night.

Studies of the effects of low-level helicopter flights on other ungulates suggest pronghorn may react more to this type of stimulus than other types of overflights. Helicopters, particularly low-level hovering helicopters, elicit greater responses than fixed-wing aircraft or aircraft flying at higher elevation (Workman *et al.* 1992, Weisenberger *et al.* 1996, Luz and Smith 1976). Pronghorn would be expected to move greater distances and respond for a longer period of time

to helicopters than to fixed-wing aircraft. In a study of disturbance effects to pronghorn in Utah, sonic booms by F-16 aircraft, subsonic aircraft flyovers, overflights by a low-level (50-100 feet AGL) Cessna 182, and low-level Huey helicopters caused elevated heart rates (Workman *et al.* 1992). Pronghorn exhibited the greatest response to a hovering Huey helicopter flown at 50 feet AGL (Workman *et al.* 1992). Pronghorn ran and looked for any way to escape hovering helicopters. Heart rates of pronghorn exposed to helicopter flyovers and hovering helicopters increased significantly. The noise and visual stimuli of a Huey helicopter flying over at 50-100 feet AGL caused the animals to bolt and run. The response of the pronghorn lasted from a few seconds to about one minute. Luz and Smith (1976) also found that pronghorn ran from a low-flying helicopter. Habituation by pronghorn, measured in terms of heart rate, to low-level flights by Huey helicopters was observed by Workman *et al.* (1992). However, pronghorn did not habituate to low-level hovering by a Huey helicopter. In addition, although heart rate declined with successive low-level helicopter flyovers, the behavioral response to bolt and run from the helicopter did not change with additional flyovers.

Disturbance and flight of ungulates caused by a variety of sources are known to result in numerous physiological effects that can be adverse, including elevated metabolism, lowered body weight, reduced fetus survival, and withdrawal from suitable habitat (Geist 1971). Mule deer disturbed by snowmobiles and humans on foot expended from 0.2 to 5.0 percent of their daily metabolizable energy in each encounter (Freddy *et al.* 1986). Frequent disturbance imposes a burden on the energy and nutrient supply of animals (Geist 1978), which may be exacerbated in harsh environments such as the BMGR, particularly during drought.

The U.S. pronghorn sub-population declined from 99 in 2000 to about 21. As a result, the encounter rate between aircraft and pronghorn will have declined similarly. Although encounters between pronghorn and aircraft are expected to be less than when the population was robust, each animal is more important (because there are fewer of them), making any adverse effects to an individual more important to the survival and recovery of the sub-population.

During ARNG use of North and South TACs, aircraft crashes and subsequent rescue and cleanup activities may occur. Krausman *et al.* (2001) witnessed pronghorn response to an F-16 crash. On February 16, 2000, five pronghorn were observed running at the moment of impact of an F-16 on South TAC. The pronghorn ran more than 30 feet after the event. Pronghorn could be hit by an aircraft or pieces of an aircraft, but this is not likely and has never been documented. Rescue operations and crash cleanup, involving emergency vehicles, trucks, and foot traffic are expected to disturb pronghorns, causing them to flush or leave the area. Fires could occur from such crashes, resulting in additional disturbance to pronghorns and loss of foraging and resting habitat. However, because of generally low fuel loads in desert scrub, a wildfire is not likely to travel a significant distance.

During ARNG use of North and South TACs, aircraft deliver live ordnance to established targets. Habitat on the targets is degraded from a long history of use by the military and thus, the potential for habitat damage from ordnance delivery is low. However, pronghorn use North and South TACs because they are attracted to the ephemeral forage that is found there during

favorable growing conditions and to water that occasionally collects in bomb craters (Hervert *et al.* 2000). Thus, pronghorn could be adversely affected by ordnance in the target areas of North and South TACs.

No mortality or injury of pronghorn as a result of ordnance delivery or unexploded ordnance have been documented. However, on July 19, 1999, remains of a pronghorn were found about 0.6 mile from a strafing target at North TAC. There was evidence of bullet impact areas near the pronghorn (M. Coffeen, Service, pers. comm. 2001), despite the distance from the target. The carcass was sent to the Service's National Wildlife Health Center (NWHC) for necropsy. The lab reported that no lead residue and no metal fragments were found in the remains (Lynn Creekmore, NWHC, pers. comm. 1999). The animal, although probably dead only a week before it was found, had already been heavily scavenged, which made it impossible to determine cause of death. Male pronghorn had been observed sparring for several days before the male pronghorn remains were found (B. Wirt, Luke AFB, pers. comm. 2001). The animal may have died during combat with another animal. Nonetheless, pronghorn in and near target areas may be injured or killed. During 374 hours of observing pronghorn on North and South TACs, Krausman *et al.* (2001) noted 594 instances of flares, bombs, smoke, and strafing. Although we do not know the percentage of these instances that were bombs or strafing, no injury or mortality of pronghorn were recorded.

In regard to high explosive ordnance delivery (but not strafing or practice bombs), and as described in the Description of the Proposed Action, Luke Air Force Base has developed operating instructions to protect pronghorn on North and South TACs (Attachment 1). These instructions are implemented during any delivery of high explosive ordnance. Monitoring conducted over several years at North and South TACs has not documented any injury or mortality of pronghorn, and the AFI may have prevented such injury or mortality. However, if only strafing is scheduled, no monitoring is required. Thus, no measures are in place to avoid or minimize adverse impacts to the pronghorn from strafing missions on days in which no high explosive ordnance delivery occurs. In addition, pronghorn could conceivably step on or otherwise cause unexploded ordnance on the ground to explode. Death or injury of pronghorns could also conceivably occur as a result of a practice bomb dropping on or near a pronghorn. All these scenarios for death or injury due to ordnance are very unlikely, due in part to the AFI, and no such mortality or injury attributable to ordnance has been documented despite several years of monitoring and the work by Krausman *et al.* (2001). The current very low numbers of pronghorn in the U.S. sub-population reduce the likelihood of injury or mortality of pronghorn due to strafing or high explosive ordnance even further.

Per the final WAATS EIS (page 4-13), ARNG use of East TAC does not cause existing training on East TAC to shift to the North or South TACs because Luke AFB eliminated their F-15 training on East TAC and began F-16 training, which can only occur on North and South TACs. Therefore, the ARNG's 1996 BA did not consider impacts to the pronghorn. The ARNG aviation training on North and South TACs only occurs during the five-week period when explosive ordnance disposal activities are taking place on East TAC, and during that time the ARNG is subject to Air Force scheduling restrictions and the AFI on North and South TACs.

Further information on the effects of aircraft use and ordnance delivery at North and South TACs can be found in the Luke Air Force Base and MCAS-Yuma biological opinions (consultation numbers 2-21-96-F-094-R1 and R2, and 2-21-95-F-114R2 and R3, respectively).

### **Effectiveness of Conservation Measures**

ARNG has proposed to implement conservation measures to minimize effects of the proposed action on the pronghorn and its habitat. Specifically, ARNG proposes to study the effects of helicopter noise on pronghorn at Camp Navajo, Arizona, and to fund a portion of the pronghorn emergency recovery actions. The noise study will complement the previous work of Workman *et al.* (1992), Weisenberger *et al.* (1996), and Luz and Smith (1976), and allow us to better evaluate the effects of the action. If the results of the study suggest significantly different effects than these other studies, and what was described herein, reinitiation of consultation may be warranted (50 CFR 402.16[b]). As discussed earlier, the emergency recovery projects are crucial to mitigating the effects of drought and human disturbance in the current range of the pronghorn. ARNG's contribution to the emergency actions is commensurate with the relative magnitude of the effects of their action relative to other BMGR users. The proposed measures minimize, but do not eliminate, the effects of the proposed action.

### **CUMULATIVE EFFECTS**

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

Most lands within the current range of the pronghorn are managed by Federal agencies; thus most activities that could potentially affect pronghorn are Federal activities that are subject to the section 7 consultation. The effects of these Federal activities are not considered cumulative effects. Relatively small parcels of private and State lands occur within the currently-occupied range of the pronghorn near Ajo and Why, north of the BMGR from Dateland to Highway 85, and from the Mohawk Mountains to Tacna. State inholdings in the BMGR were recently acquired by DoD. 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 their effects are expected to continue into the foreseeable future. Historical habitat and potential recovery areas 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 particular concern are increasing illegal border crossings by undocumented migrants and smugglers. Deportable migrant apprehensions by Border Patrol agents in the Ajo Station increased steadily from 9,150 in 1996 to 20,340 in 2000. Apprehensions in the BMGR by Border Patrol were 9,500, 11,202, and 8,704 in 1996, 2000, and 2001, respectively (URS

Corporation 2003). In 2001, estimates of undocumented migrants traffic reached 1,000 per night in Organ Pipe Cactus NM alone (Organ Pipe Cactus NM 2001). Given these numbers and that Border Patrol apprehends only a fraction of illegal migrants and smugglers, undocumented illegal traffic through the BMGR probably exceeds recreational use even on the busiest of holiday weekends. Increased presence of Border Patrol in the Douglas, Arizona area, and in San Diego (Operation Gatekeeper) and southeastern California, have pushed undocumented migrant and smuggler traffic into remote desert areas, such as Cabeza Prieta NWR, Organ Pipe Cactus NM, and BMGR (Klein 2000). These illegal crossings and law enforcement response have resulted in route proliferation, off-highway vehicle (OHV) 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 almost certainly results from these illegal activities. We expect these activities to continue; however, some discussions are occurring between Mexican and U.S. officials about the creation of a guest worker program whereby Mexican nationals could legally cross the border to work in the U.S. If such a program was initiated, it might greatly reduce future illegal immigration and law enforcement response, with concomitant reductions in habitat degradation and suspected disturbance of pronghorn.

## CONCLUSION

After reviewing the current status of the Sonoran pronghorn, the environmental baseline for the action area, the effects of ARNG's proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the Sonoran pronghorn. No critical habitat has been designated for this species, therefore, none will be affected. In making our determination, we considered the following:

- As reflected in the Environmental Baseline and cumulative effects sections above, the U.S. sub-population of pronghorn has been and is subjected to a myriad of human activities that have the potential to adversely affect the Sonoran pronghorn and its habitat. Such activities include livestock grazing, recreation, military activities on the BMGR, and an increasing influx of undocumented migrants and smugglers and corresponding response from the U.S. Border Patrol and other law enforcement agencies. Further, the range of the U.S. pronghorn sub-population is limited by highways, fences, canals, and towns that act as physical barriers to pronghorn movement and prevent them from accessing foraging areas and, during drought, greenbelts such as the Gila River and Rio Sonoyta.
- The status of two of the three sub-populations of Sonoran pronghorn are in decline and in serious danger of extirpation. The U.S. sub-population is estimated at 21 animals, while the Pinacate sub-population is estimated at 25. At these levels, population viability is low and genetic variability is expected to erode. The southernmost sub-population, southeast of Mexico Highway 8, also declined from 2000-2002, but at an estimated 255 animals, it is not in immediate danger of extirpation.

- While drought was the proximate cause of the Sonoran pronghorn's decline during 2002, the high level of human activities and disturbance on the U.S. side has exacerbated the effects of drought. Increasing undocumented migrant traffic, smuggling and associated law enforcement response are of particular concern.
- Emergency recovery actions have been initiated in an attempt to reverse the recent decline in the status of the U.S. sub-population. A semi-captive breeding facility will be completed this year in which pronghorn will be housed in a predator-free environment with abundant forage and water. It is hoped that pronghorn will successfully reproduce in the facility and provide animals to augment the wild population. A forage enhancement plot will be created inside the facility, and another in the same area is currently in operation. These will provide green forage for pronghorn during times of drought. Water sources are also being developed. These water sources and forage enhancement plots are expected to buffer the effects of drought, which have been the proximate cause of recent population declines. ARNG has committed to supporting up to five percent of emergency recovery actions on the BMGR.
- Potential adverse effects to the U.S sub-population from ARNG activities include helicopter overflights in North and South TACs that may cause fleeing, increased stress, and temporary exclusion from habitat; possible strafing, high explosive ordnance delivery, or contact with unexploded ARNG ordnance on North and South TACs that may injure or kill a pronghorn, and continued disturbance at East TAC (outside the current range of the pronghorn, but within historical habitat). The likelihood of these effects being realized are a function of the frequency and duration of the activities and the number and distribution of the pronghorn when the activities occur. Some of the factors mitigating the potential for adverse effects from these activities include:
  - Use of North and South TACs by ARNG only occurs when East TAC is unavailable due to explosive ordnance disposal (typically about five weeks a year). Use of North and South TACs by ARNG is typically less than one percent of annual military use of that tactical range.
  - Tactical range procedures, required of all range users by Luke Air Force, are in force to protect pronghorn that may occur at or near North and South TACs. Biological monitors and procedures minimize the likelihood of pronghorn being injured or harmed on the tactical ranges when ordnance is delivered. No Sonoran pronghorn have been demonstrated to have been injured or killed by ordnance delivery or by contact with unexploded ordnance.
  - The likelihood of encounters between pronghorn and military activities, and the possibility that incidental take will result from ARNG activities are significantly diminished due to the small size of the U.S. sub-population.



- ARNG has proposed to contribute funding for pronghorn emergency recovery actions on the BMGR. Although they would fund only up to 5 percent of such activities annually, these crucial actions, such as forage enhancement and waters, are expected to buffer the effects of drought and human disturbance on the U.S. sub-population. The helicopter noise study proposed by ARNG will contribute to our knowledge of how ARNG's activities affect pronghorn.

In summary, the status of the listed Sonoran pronghorn rangewide is poor, with sub-populations in the Pinacate Region of Mexico and in the United States facing possible extirpation. Fragmentation of populations, loss of historical habitats, disease, and human-caused degradation of remaining habitats and disturbance of pronghorn are the most important causes of poor rangewide status. As discussed in the "Environmental Baseline" section above, within the action area, 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 and disease exposure, combined with periodic dry seasons or years, are responsible for the present precarious status of the Sonoran pronghorn in the U.S. The dramatic impacts to the U.S. sub-population of pronghorn resulting from the 2002 drought have undoubtedly been exacerbated by the human-induced degradation of their habitat and human-created barriers, which restrict their movement. Cumulative effects, particularly illegal crossings of the border and travel through pronghorn habitat by smugglers and undocumented immigrants, add additional stressors to pronghorn populations.

At the current time the environmental baseline with respect to the Sonoran pronghorn is declining. However, the high fawn-to-doe ratio experienced in 2001 when rainfall was abundant and timed well for forage production provides evidence of the reversible nature of the current decline. The potential for the U.S. sub-population to rebound will be enhanced by the emergency recovery actions, such as forage enhancement plots, water developments, and the semi-captive breeding facility. When added to the environmental baseline, and cumulative effects, the effects of ARNG's proposed action, which includes significant conservation measures, do not reduce appreciably the likelihood of survival and recovery of the Sonoran pronghorn in the wild. As proposed, ARNG's actions affect a very small proportion of suitable pronghorn habitat within the current range of the U.S. sub-population (North and South TACs) and most use occurs during about five weeks each year. Under normal circumstances, the likelihood for interaction between the military activities and pronghorn are mitigated by the short duration and frequency of the activities and the conservation measures that will be undertaken by ARNG. The interactions, however, are currently less likely to occur because of the very small sub-population remaining in the United States. Moreover, emergency recovery actions, such as water developments and forage enhancement plots, should make the pronghorn less susceptible to biologically significant threats during drought conditions.

In determining that the proposed action is not likely to jeopardize the continued existence of the pronghorn, we assume that the conservation measures will be implemented fully and promptly, as proposed by ARNG, and that take of pronghorn is not reasonably certain to occur. If the

emergency recovery actions are not successful or conservation measures are not implemented fully and promptly, it may be necessary to reinitiate consultation to confirm that the activities are not likely to jeopardize the continued existence of the species.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.31) 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. "Harass" is defined (50 CFR 17.31) 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. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

#### **Amount or Extent of Take Anticipated**

In the "Effects of the Proposed Action" we have identified several ways in which incidental take may potentially occur, including strafing or ordnance delivery, or contact with ARNG unexploded ordnance at or near North or South TAC targets, or short-term disturbance of pronghorn or exclusion from important foraging or fawning habitat by helicopter activity during drought when pronghorn are particularly stressed and in poor condition. Nonetheless, we are not aware that any incidental take of pronghorn has occurred as a result of the activities of ARNG. With only 21 pronghorn in the U.S. sub-population, the likelihood of any one pronghorn being harassed or otherwise taken is greatly reduced compared to the 1990s when the population was over 100, and at most times, well over 100. Also, conservation measures are in place to minimize the likelihood of take from these activities. As a result we do not believe incidental take of pronghorn is reasonably certain to occur at current population levels.

### **CONSERVATION RECOMMENDATIONS**

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

ARNG should use its authorities to fund implementation of key recovery actions identified by the Sonoran Pronghorn Recovery Team (see Appendix 1 of the November 16, 2001, WAATS opinion).

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of the conservation recommendation.

### REINITIATION STATEMENT

This concludes formal consultation on the WAATS expansion project. 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. If the results of the helicopter noise study suggest effects of your action are significantly different than that described herein, you should contact us to determine if further consultation is necessary.

Thank you for your cooperation and assistance throughout this consultation process. Any questions or comments should be directed to Jim Rorabaugh (x238) or Sherry Barrett (520/670-4617) of my staff.

Sincerely,

/s/ Steven L. Spangle  
Field Supervisor

W:Waatsbo03revfin.wpd:fg

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ  
Regional Solicitor, Department of the Interior, Albuquerque, NM  
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Table 3. A summary of population estimates from literature and field surveys for Sonoran pronghorn in the U.S.

Date	Population estimate (95 percent CI <sup>a</sup> )	Source
1925	105	Nelson 1925
1941 <sup>b</sup>	60	Nicol 1941
1957	<1,000	Halloran 1957
1968	50	Monson 1968
1968-1974	50 - 150	Carr 1974
1981	100 - 150	Arizona Game and Fish Department 1981
1984	85 - 100	Arizona Game and Fish Department 1986
1992	179 (145-234)	Bright <i>et al.</i> 1999
1994	282 (205-489)	Bright <i>et al.</i> 1999
1996	130 (114-154)	Bright <i>et al.</i> 1999
1998	142 (125-167)	Bright <i>et al.</i> 1999
2000	99 (69-392)	Bright <i>et al.</i> 2001
2002	21 (18-33)	Bright <i>et al.</i> 2002

<sup>a</sup> Confidence interval; there is only a 5 percent chance that the population total falls outside of this range.

<sup>b</sup> Population estimate for southwestern Arizona, excluding Organ Pipe Cactus National Monument.



Table 4. Comparison of U.S. Sonoran pronghorn population surveys, 1992-2002.

Date	Pronghorn observed		Population estimates		
	On transect	Total observed	Density estimate using DISTANCE (95 percent CI) <sup>a</sup>	Lincoln-Peterson (95 percent CI)	Sightability model (95 percent CI)
Dec 92	99	121	246 (103-584)	---	179 (145-234)
Mar 94	100	109	184 (100-334)	---	282 (205-489)
Dec 96	71	82 (95 <sup>b</sup> )	216 (82-579)	162 (4-324)	130 (114-154)
Dec 98	74	86 (98 <sup>b</sup> )	---	172 (23-321)	142 (125-167)
Dec 00	67	69 <sup>b</sup>	---	---	99 (69-392)
Dec 02	18	0	---	---	21 (18-33) <sup>c</sup>

<sup>a</sup> Confidence interval; there is only a 5 percent chance that the population total falls outside of this range.

<sup>b</sup> Includes animals missed on survey, but located using radio telemetry.

<sup>c</sup> Jill Bright, Arizona Game and Fish Department, pers. comm. 2003

Table 5. Comparison of Sonoran pronghorn surveys in Mexico, 1993, 2000, and 2002.

	Total number of pronghorn seen	Sightability model (95 percent CI <sup>a</sup> )
<i>March 1993</i>		
Southeast of Highway 8	163	289 (226-432)
West of Highway 8	51	124 (91-211)
Total	214	414 (317-644)
<i>December 2000</i>		
Southeast of Highway 8	249	311 (261-397)
West of Highway 8	17	34 (27-48)
Total	266	346 (288-445)
<i>December 2002</i>		
Southeast of Highway 8	19	25 <sup>b</sup>
West of Highway 8	195	255 <sup>b</sup>
Total		

<sup>a</sup> Confidence interval; there is only a 5 percent chance that the population total falls outside of this range.

<sup>b</sup> These estimates are tentative and confidence intervals have not yet been generated.

Table 6. Diseases transmissible between cattle and pronghorn.

<u>Actual Documented Disease</u>	<u>Reservoirs/O ddities/ Transmission Routes</u>	<u>Clinical Signs</u>	<u>Control</u>	<u>Citation(ts)</u>
<b>BACTERIAL DISEASES</b>				
<u>Leptospirosis</u> <i>Leptospira interrogans</i> serovar <i>hardjo</i>	transmitted thru infected urine, fetal tissues or rarely aerosol; organism can live outside host for up to 6 months in soil, water or on vegetation; asymptomatic shedders can transmit the disease over the long-term	fever, blood-tinged urine, jaundice, renal failure, abortion	reduce contact among domestic and wild animals; reduce incidence of stagnant water and moist, warm conditions; control situations where virus can be shed	Merck (1986) Kreplin (2002)  Leighton and Kuiken (2001)
<b>VIRAL DISEASES</b>				
<u>Bluetongue</u> Bluetongue orbivirus (BTV)	vector = infected biting midge <i>Culicoides sonorensis</i> ; BTV also associated with cattle lice <i>Haematopinus eurysternus</i> ; infected blood and semen can also directly transmit disease; highest incidence of disease in July-Sept	fever, inflamed, ulcerated erosion in mouth; lameness; abortion; emaciation; sterility, growth delay, death	reduce vector attraction to fetid water sources; reduce contact, overcrowding and competition, particularly July to September	Howerth, <i>et al.</i> (2001)  World Organisation for Animal Health (2002)  Stott (2002)
<u>Epizootic hemorrhagic disease</u> Epizootic hemorrhagic disease orbivirus (EHDV)	vector = infected biting midges <i>Culicoides sonorensis</i> and <i>C. insignis</i>	depression, fever, uncoordinated gait (ataxia), “running fits”/convulsions/ seizures, sudden death; sick and dead animals often found in or near water	reduce vector attraction to fetid, fecal-infested water sources; reduce contact, overcrowding and competition, particularly July to September	Howerth, <i>et al.</i> (2001)  Howerth and Stallknecht (2002)  Stott (2002)
<u>Pronghorn Exposure Documented by Antibody/Seroconversion</u>				
<b>BACTERIAL</b>				



<p><u>Malignant Catarrhal Fever</u>  Malignant Catarrhal Fever (MCF)  gammaherpesvirus</p>	<p>aerosol or contact with nasal or ocular fluids; fecal contamination</p>	<p>Fever, profuse nasal discharge, corneal opacity, swollen lymph nodes, inflamed oral, ocular and nasal mucosas; occasionally central nervous signs with diarrhea, skin lesions and arthritis; high mortality rate</p>	<p>cattle kept separated from potential reservoirs; "stocking of ...antelope, wild sheep or goats should be discouraged"</p>	<p>Heuschele and Reid (2001)   Heuschele (2002)</p>
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**Attachment 1: AFI LAFB**