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In Reply Refer to:
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02EAAZ00-2014-F-0161

September 9, 2014

Mr. Gordon Rogers
Garrison Manager
Department of the Army
U.S. Army Installation Management Command
Headquarters, United States Army Garrison, Yuma
Yuma, Arizona 85365-9498

RE: Formal Section 7 Consultation on Activities and Operations at the United States Army Garrison Yuma Proving Ground, Yuma and La Paz Counties, Arizona

Dear Mr. Rogers:

This letter is in response to your March 25, 2014, request for formal consultation for Activities and Operations at the United States Army Garrison Yuma Proving Ground (YPG), Yuma and La Paz Counties, Arizona. Your request was received by us on March 25, 2014, and was made pursuant to section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq*.). At issue are the impacts to Sonoran pronghorn (*Antilocapra americana sonoriensis*). YPG is located within the nonessential experimental population (or 10(j)) range of the Sonoran pronghorn, and therefore, for section 7 consultation purposes, the population of Sonoran pronghorn on YPG is treated as a species proposed to be listed. YPG is adjacent to Kofa National Wildlife Refuge (NWR), where Sonoran pronghorn are treated as a threatened species for section 7 purposes. Accordingly, you specifically requested formal consultation for effects to Sonoran pronghorn on Kofa NWR from the proposed action, as well as our concurrence with your determination that the proposed action will not jeopardize the continued existence of Sonoran pronghorn[1].

[1] From USFWS 2011 (Final rule for the establishment of a nonessential experimental population of Sonoran Pronghorn in southwestern Arizona): When nonessential experimental populations (NEP) are located outside a NWR or National Park Service unit, for the purposes of section 7 we treat the population as proposed for listing and only two provisions of section 7 apply—section 7(a)(1) and section 7(a)(4). In these instances, NEPs provide additional flexibility because Federal agencies are not required to consult with us under section 7(a)(2). Section 7(a)(4) requires Federal agencies to confer (rather than consult) with the USFWS on actions that are likely to jeopardize the continued existence of a species proposed to be listed. The results of a conference are in the form of conservation recommendations that are optional as the agencies carry out, fund, or authorize activities. Because the nonessential experimental population is, by definition, not essential to the continued existence of the species then the effects of proposed actions on the NEP will generally not rise to the level of jeopardizing the continued

This biological opinion is based on the project proposal, literature, telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the Sonoran pronghorn, effects of military activities and operations on this species, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

- November, 2013: You contacted us to inform us of your proposed action and to discuss potential effects to Sonoran pronghorn.
- January 6, 2014: We had a conference call with you and Kofa NWR to discuss the proposed action and its potential effects to Sonoran pronghorn on Kofa NWR.
- March 25, 2014: We received your request for formal consultation.
- November 2013 to April 2014: Our office regularly corresponded regarding the proposed action.
- May 19, 2014: We sent you the draft biological opinion.
- June 11, 2014: You sent us your comments on the draft biological opinion.
- June 12, 2014: We sent you a revised draft biological opinion with changes made based on your June, 11, 2014 comments and a subsequent conversation with you.
- June 23 to August 27, 2014: Our offices and Kofa NWR had a number of communications regarding the firing of munitions over Kofa NWR.
- August 21, 2014: You sent us your final comments on the draft biological opinion, including comments clarifying the issue regarding firing over Kofa NWR.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

A complete description of the proposed action is found in your March 2014 Biological Evaluation (BE) for Continued Operations at YPG and August 2013 Draft Programmatic Environmental Impact Statement (DPEIS) to assess the potential impacts associated with current and future military activities and operations at YPG. The proposed action includes current and future military activities and operations at YPG that will or are likely to occur over the next 10 to 20 years, including military testing and training activities, current and future construction and demolition, as well as continued operations and maintenance of the range and facilities, including roads, utilities, and other infrastructure. Much of the proposed action has no effect on Sonoran pronghorn on Kofa NWR, primarily due to the distance of the

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existence of the species. As a result, a formal conference will likely never be required for Sonoran pronghorn established within the nonessential experimental population area. Nonetheless, some agencies voluntarily confer with the Service on actions that may affect a proposed species.

activities from Kofa NWR. Therefore, these activities will not be described in this section or analyzed in the effects of the action section. The activities of concern for this consultation include those that occur on the Kofa range of YPG (see range descriptions below) (Figure 1), due to the proximity of the Kofa range to Kofa NWR where Sonoran pronghorn are treated as a threatened species for section 7 purposes. The primary activities of concern, which will be described in this section and analyzed in the effects of the action section, include air operations over the Kofa range and NWR; air delivery; firing and impact of munitions; munitions demolition; use and expansion of light training areas; and maintenance of range infrastructure.

YPG covers over 838,000 acres located in Yuma and La Paz Counties in the southwest corner of Arizona about 25 miles north of the city of Yuma. The Kofa NWR is nested within the "U" shape of the YPG borders. YPG is divided into three regions: Cibola, Laguna, and Kofa (Figure 1). The ranges within the three regions are used for:

- Testing and evaluation of weapons, ammunition, explosive ordnance, and related items;
- Air cargo delivery, testing of precision guided and non-precision guided cargo and personnel parachute systems, airdrop certification of equipment and ammunition, certification of aircraft for airdrop operations, external transportability testing, and general Soldier systems testing;
- Development and performance testing of aircraft armament components and systems;
- Testing of computers, software, communications (wireless and wired), networks, data, sensors (radar, electro-optical, infrared, laser, seismic, acoustic, biometrics, hyperspectral, signal detection, etc.), and sensor platforms (aerostats, airships, aircraft, vehicles, towers, etc.);
- Use of Unmanned Aerial Systems (UAS) includes the Ground Control Station (GCS), UAS, launch/recovery systems, and other ancillary equipment. UAS testing includes rotary wing, fixed wing, high altitude long endurance, medium altitude long endurance, high speed jet, and transitional vertical take-off and landing airships;
- Combat and automotive systems testing including the testing and evaluation of wheeled and tracked vehicles, direct fire programs, combat vehicle weapons systems and related munitions, target acquisition systems, vehicle components, communication systems, and related items including fire control systems, fuels, lubricants, and other automotive chemical products;
- Counter Improvised Explosive Devices (IED) Testing which involves the use of large complexes of buildings, roads, bridges and overpasses, and other infrastructure that replicate typical urban settings and overseas combat areas. Much of this activity revolves around electronic warfare; and
- Training and operational testing where troops use various weapons, munitions, vehicles, aircraft, and systems under tactical conditions and includes both vehicle-mounted training and dismounted training.

In addition to ongoing activities, which are described in greater detail below, Table 2.5 of the BE includes an entire list of 31 new activities (and their corresponding reference number) that occur on the Kofa range. Of these, there are four new activities that may affect Sonoran pronghorn on Kofa NWR due their proximity to the refuge; these are included in the following table and described in greater detail below (and analyzed in the effects of the action section). Additionally, their location (using the reference number) is depicted on Figures 2a and 2b in the Tables and Figures section below.

EXCERPT FROM TABLE 2-5 OF THE BE. FOUR ACTIVITIES (OF 31) THAT MAY AFFECT SONORAN PRONGHORN ON KOFA NWR DUE TO THEIR PROXIMITY TO KOFA NWR.
Proposed Action Activities Analyzed in Detail – Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Impacts [a, b]
K002	Construct 1,250-ft radius dropzone for personnel and cargo drops northeast of East Smart Weapons Test Range (SWTR) Impact Area.	Activity-related soil and vegetation disturbance at site (113 ac) and associated utility lines (0.37 ac).
K003	Expand munitions impact area from north boundary of Echo and Foxtrot to north boundary of contaminated area (Advanced Munitions Range).	Long-term soil and vegetation disturbance from inert and explosive munitions impact (24,309 ac).
K004-a	Construct aircraft shelter, multiple buildings, water tank, POL storage area, and graded parking area, and clear a launch/recovery area at SWTR.	Construction-related soil and vegetation disturbance at site (aircraft shelter 52,500 ft^2, command and control building 2,000 ft^2, office building 600 ft^2, maintenance building 900 ft^2, 30,000-gallon water tank 1,000 ft^2, POL storage area 900 ft^2, graded parking area 7,500 ft^2, and UAS launch/recovery area - vegetation clearing of 162 ac and adding 282,600 ft^2 of ABC in center of area). Construction-related emissions. Increased impervious area.
K026	Expand light maneuver training area to support operational testing and dismounted maneuver training at SWTR.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (8,840 ac). Note, additional NEPA analysis would be required for any new bivouac areas. The detailed analysis only addresses dismounted maneuvers.

[a] Measurements are approximate.
[b] Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

Military Testing and Training

Aerial operations

Airspace and flights

There is restricted military airspace over most of YPG and Kofa NWR (Figure 3). The majority of YPG restricted airspace is used for test missions; however, the U.S. Department of Justice operates a Special Use Airspace (R-2309), which restricts military mission access as well as commercial use. Outside of the Department of Justice Special Use Airspace, the restricted airspace on YPG is prioritized for testing and training conducted at the installation. YPG restricted airspace allows testing of UASs and weapons systems, such as mortars and rockets. Secondary priority for use of this restricted airspace is for other military users. This airspace is also occasionally used for other non-testing and training purposes such as aerial surveys for wildlife, reconnaissance, or transportation of people or equipment. Aircraft used in YPG airspace includes a variety of fixed wing aircraft from small UAS to large cargo planes used for air delivery. Helicopters are typically active in R-2306A and R-2306B, which are several miles from Sonoran pronghorn habitat, although as explained below, helicopters may occasionally be used in areas where pronghorn occur or may occur. Aircraft do not hover in one area over the refuge, but pass by, which reduces disturbance to wildlife.

YPG conducts flights over the refuge daily within airspace R-2307, R-2308A, R-2308B, and R-2308C (Figure 3). Airspace **R-2308A** is primarily over the Kofa NWR and covers all of the King Valley area within the refuge. The lower limit of this airspace is 1,500 feet above ground level (AGL); however, the YPG Operational Noise Management Plan (ONMP) identifies Kofa NWR as an area where pilots are recommended to remain at least 2,000 feet AGL. That said, flights this low are extremely rare and almost all of the military use of this airspace occurs between 8,000 and 32,000 feet AGL. Military use of helicopters is very rare within R-2308A (the primary airspace over Kofa NWR), but may occasionally occur.

Airspace R-2307 covers the YPG Kofa Firing Range and the southern portion of the Kofa NWR and ranges from surface to unlimited altitude. Fixed wing flights very rarely occur at low levels; however, helicopters may occasionally fly at low levels in R-2307. Helicopters will be used to locate people on Kofa NWR (primarily in R-2307) where large portions of an SDZ overlap the refuge (see details in the *Munitions* section below).

Aerial delivery

Aerial delivery includes air cargo delivery, testing of precision guided and non-precision guided cargo and personnel parachute systems, airdrop certification of equipment and ammunition, certification of aircraft for airdrop operations, external transportability testing, and general soldier systems testing. Aerial delivery is only conducted in drop zones (DZ). Restricted airspace over the DZs is controlled by YPG. Testing consists of airdrops of personnel, equipment, and ammunition. Most airdrop testing and training is done during the day, with occasional night operations.

Drop Zones are equipped with instrumentation necessary for tracking dropped loads from the aircraft to the ground. Instrumentation such as radars or optical sensors, some of which may be truck mounted or hard mounted, is placed outside the DZs for safety purposes but can be placed near the Kofa NWR boundary. Once cargo or personnel have landed they are picked up by vehicles driving across the DZ, sometimes cross country. The type of vehicle used to recover loads varies greatly depending on the size of cargo dropped and can range from small utility vehicles to large heavy hauling trucks. There are currently no DZs in or near Sonoran pronghorn habitat near Kofa NWR; however, a new DZ is proposed for construction in the King Valley near Kofa NWR (identifier K002, Figure 2a and 2b). See more information about the proposed DZ below under the section on Facilities Construction, Operation, and Maintenance.

Ground-based operations

Munitions

All munitions firing and ordnance deliveries occur on YPG and not within Kofa NWR. The impact area boundary within potential pronghorn habitat is located approximately one kilometer south of the Kofa NWR boundary (Figure 2a and 2b). Rounds are fired from established gun positions that are either permanent or temporary and there are numerous gun positions across YPG, including within the impact areas.

YPG carefully plans each shot on the range with consideration of the gun position from which ordnance is fired to the target or impact area. Test directors take into account the capabilities and past performance of the ordnance and blast radius to develop a SDZ (also called a safety fan) in which the munitions could inadvertently land. Range control coordinates these firing programs to ensure that the SDZs remain on YPG or within previously established buffer zones on Kofa NWR. The algorithm used to establish the dimensions for the SDZ uses a 1/1,000,000 probability of munitions landing outside the fan. Currently between about 940,000 to 1,620,000 rounds, including small arms, are fired annually on YPG. The

number of artillery rounds is between, 210,000 and 420,000 rounds per year depending on the demand for testing.

A letter dated December 3, 1958, from the Secretary of the Interior granted permission to YPG to use 171,000 ac of Kofa NWR as an artillery fire buffer zone. This buffer zone allows munitions to be fired over, but not into Kofa NWR. Instances of munitions landing outside the SDZ or safety fan or on the refuge are extremely rare; however, there have been past incidents of munitions being fired over Kofa NWR and landing on the refuge. To provide safety to people and natural resources, use of this buffer area will be in accordance with stipulations provided by the 1958 permission letter. Any firing program that involves SDZs on or munitions fired over Kofa NWR will require extensive coordination with the refuge. YPG will verify there are no people in the portion of an SDZ extending into the Kofa NWR primarily by visual or electronic means. Helicopters, however, will be used to locate people only where large portions of an SDZ overlap Kofa NWR (primarily in R-2307).

In the rare event that munitions fall onto Kofa NWR, YPG will coordinate with the refuge to remediate the impacts as soon as possible. Additionally, YPG will ensure impacts to Sonoran pronghorn are avoided to the extent possible. Due to the locations of the targets and gun positions as well as safety planning for firing programs, it is highly unlikely that pronghorn would be directly injured or killed by munitions.

Each round fired on YPG is carefully tracked and if ordnance lands outside the authorized area, including Kofa NWR, it is removed or destroyed. YPG also recovers or destroys unexploded ordnance that fall outside of authorized areas or that may pose a threat to people on the range. Also, some munitions testing require that each piece of ordnance be recovered for further testing. Field crews may use trucks, all-terrain vehicles, or heavy equipment to access and remove ordnance. If an item is too dangerous to move, it may be detonated in place.

In addition to ongoing munitions testing, the proposed action includes expanding the munitions impact area from the northern boundary of existing impact areas Echo and Foxtrot to the northern boundary of the Ramsdell Ranch impact area and the area previously contaminated by unexploded ordnance (identifier K003; Figure 2a and 2b), which is about one kilometer south of the Kofa NWR southern boundary. Expanding the available munitions impact area will not result in increased frequency of munitions firing; however, it will result in additional impacted areas on YPG. In other words, munitions firing is dependent on the demand for testing, not on the area available for testing. Targets may be placed within the expanded impact area and some tests may require that ordnance be recovered for further testing. Also some tests require temporary gun positions or temporary observation points be established inside the impact area.

Noise from munitions fired on YPG can be heard off the installation, but the intensity of the sound decreases with distance. The noise contour figures from the Installation ONMP indicate that the portion of Kofa NWR that is suitable habitat for Sonoran Pronghorn (i.e. King Valley) is located outside the 57-63 C-Weighted Day-Night Level (CDNL) contour (Figure 4). This means that the magnitude of sound experienced by any pronghorn on the refuge would be less than 57 decibels (dB) for most actual explosions within the impact area on YPG. For comparison, normal conversation between two people three feet apart is approximately 60-65 dB. Explosions from munitions testing and training on YPG in the Castle Dome Mountains along the western and southern boundary of Kofa NWR would be audible to pronghorn in portions of the area they occupy. Because munitions testing and training is relatively constant in this area, the noise from these events may be perceived by Sonoran pronghorn as part of the background noise.

Munitions testing can occasionally result in wildfire occurring on the Kofa range, and in rare instances, on Kofa NWR. Most fires on YPG are very small and isolated due to the sparse nature of fuels in this region. From 2003 to present, there were an estimated 26 fire starts on YPG and a total of 3,170 acres burned on YPG. Of that total, 3,000 acres was from one event, the King Valley Fire in September 2005. The King Valley Fire, ignited due to munitions impact on YPG, is the only major documented fire originating on YPG in over 70 years of military testing and training activities. In addition to burning 3,000 acres on YPG, it burned 26,000 acres on Kofa NWR for a total of about 29,000 acres. The King Valley Fire was carried by dry annual plants left from the wet winter, in particular, dried Indian wheat (*Plantago insularis*) and Mediterranean grass (*Schismus barbatus)*, along with other species. Cured herbaceous vegetation carried the fire over the terraces between the ephemeral washes and also along the washes where it provided ladder fuels to the denser woody vegetation. Although this type of fire is very rare, YPG has adopted more effective communication protocols in responding to fires in effort to reduce the spread of such wildfires.

Light Training Area

Light maneuver training areas (LTAs) are for dismounted training with vehicle use restricted to existing improved roads and both maintained and unmaintained unimproved roads. Only incidental off-road vehicle operation related to troop or equipment drop-off or pick-up occurs. Training is conducted in designated areas in all three regions of YPG, including the Kofa region. In most areas, training is limited to company-level (approximately 120 troops) or smaller units.

Training activities in LTAs may include bivouacs, which are located near roads to provide ease of access for troops and portable toilets. However, no new bivouac areas are proposed in the expanded portion of the LTA. Any new proposed bivouac areas would require additional environmental compliance. During bivouacs, no digging or other ground intrusive activities occur and typically previously disturbed areas are selected. Trailer-mounted 60-kilowatt generators may be used during training.

Part of the proposed action includes expansion of an LTA (identifier K026) to support operational testing and dismounted maneuver training at Smart Weapons Test Range (SWTR). Expanding the LTA will result in impacts to vegetation on YPG from human activity and staging of equipment.

Electronic Warfare/Communication/Sensor Testing

YPG conducts testing for a variety of electronic systems including radars, Counter-IED systems, communications devices, and optical sensors. Testing of these items usually involves personnel carrying devices across a test area, or vehicles equipped with the devices driving along an established road to specific test areas. Sometimes temporary antennas may be erected as part of a test. In some tests, a person or vehicle will serve as a target for detection by test devices. This type of testing is likely to occur anywhere on YPG and results very little ground disturbance.

Observation Points

Observation points are used to observe various types of testing on YPG. These points are scattered throughout YPG and are subject to routine access by people and vehicles. Some observation points may include minor structures for housing observers and/or equipment. The closest mapped observation point to the southern boundary of Kofa NWR is 3.4 kilometers to the south; however, observations of testing may be made from anywhere on YPG.

Facilities and Roads Construction, Operation, and Maintenance

The proposed action includes expansion of the existing 110,000 acres of impact areas on the Kofa range by 24,309 acres. Much of this expansion will occur in the King Valley region which is contiguous with Sonoran pronghorn habitat on the Kofa NWR. The purpose of expansion of these impact areas is to add flexibility for target locations and reduce scheduling conflicts between firing programs. Expansion is also intended to minimize the likelihood that any munitions land outside of an impact area.

The proposed action also includes construction of a 1,250-ft radius drop zone (DZ) for personnel and cargo drops northeast of East Smart Weapons Test Range (SWTR) Impact Area (identifier K002; Figures 2a and 2b). Development of this site will include construction of utility lines and testing instrumentation to track dropped loads. The new site will be impacted by vehicles traveling across the DZ to recover dropped items or personnel. See the aerial delivery section above for information on use of DZs.

Also proposed are construction of an aircraft shelter, multiple buildings, a water tank, storage area for petroleum products, and graded parking area, as well as clearing of a launch/recovery area at SWTR (identifier K004-a, Figure 2a and 2b). These activities will occur in an area where current human activity is high and will not be in immediate proximity to the water tank used by pronghorn on YPG. Although the exact location of the construction is not known, they may be within a few kilometers of the southern boundary of Kofa NWR.

Maintenance of range infrastructure such as observation points, utilities, and roads occurs throughout YPG. Observation point maintenance activities are implemented as the need is identified; however, the closest mapped observation point to the southern boundary of Kofa NWR is 3.4 kilometers. Routine maintenance and replacement of existing utility systems (fiber optics, power, water, etc.) is conducted on YPG. Some of these utilities reach within a kilometer of Kofa NWR in Sonoran pronghorn habitat. Unless placed within an existing utility corridor, any new utility line route would require additional environmental compliance. Routine road maintenance on the Kofa range is conducted as the need is identified. The closest this maintenance occurs to Sonoran pronghorn habitat on the Kofa NWR is about 700 meters. Construction of any new roads would require additional environmental compliance. Maintenance of infrastructure may involve different types of vehicles and equipment accessing the various sites.

Conservation Measures

YPG will implement the following conservation measures for Sonoran pronghorn:

1. Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn, which includes: a) notifying USFWS and other appropriate parties as outlined in the protocol as soon as possible if Sonoran pronghorn are observed on YPG that are injured, sick or dead; and b) coordinating range access for USFWS and AZGFD as appropriate for capture of sick or injured pronghorn, as well as recovery of dead individuals if necessary. Coordination will involve adherence to range safety and security procedures.
2. Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission.
3. YPG will adhere to the terms of the Memorandum of Understanding between the Kofa NWR, Imperial NWR, Bureau of Land Management, and YPG which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands.

Additionally, in the event future actions on YPG have the potential to affect Sonoran pronghorn on Kofa NWR, YPG will consult with the USFWS as appropriate.

STATUS OF THE SPECIES - SONORAN PRONGHORN

A. Legal Status

The Sonoran subspecies of pronghorn (*Antilocapra americana sonoriensis*) was first described by Goldman (1945) and is the smallest of the four subspecies of pronghorn (Nowak and Paradiso 1983, Brown and Ockenfels 2007). The subspecies was listed throughout its range as endangered on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 without critical habitat. Four sub-populations of the Sonoran pronghorn are extant: 1) a U.S. sub-population in southwestern Arizona on Cabeza Prieta National Wildlife Refuge (CPNWR), Organ Pipe Cactus National Monument (OPCNM), Bureau of Land Management (BLM) – Ajo Block, and Barry M. Goldwater Range (BMGR) (endangered population), 2) a sub-population in southwestern Arizona on Kofa NWR, YPG, and surrounding areas (nonessential experimental 10(j) population) (established in 2013), 3) a sub-population in the Pinacate Region of northwestern Sonora, and 4) a sub-population on the Gulf of California west and north of Caborca, Sonora. The four sub-populations are predominantly geographically isolated due to barriers such as roads and fences.

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

The U.S. Fish and Wildlife Service (USFWS) and the Sonoran Pronghorn Recovery Team (Team) are currently revising the Sonoran Pronghorn Recovery Plan. The revised plan will address Sonoran pronghorn populations both in Mexico and the U.S. and will be finalized in 2015.

B. Life History and Habitat

Sonoran pronghorn inhabit one of the hottest and driest portions of the Sonoran Desert. They forage on a large variety of perennial and annual plant species (Hughes and Smith 1990, Hervert *et al.* 1997b, U.S. Fish and Wildlife Service 1998). During drought years, Hughes and Smith (1990) reported cacti were the major dietary component (44 percent). Consumption of cacti, especially chain fruit cholla

(*Cylindropuntia fulgida*, Pinkava 1999), provides a source of water during hot, dry conditions (Hervert *et al.* 1997b). Other important plant species in the diet of the pronghorn include pigweed (*Amaranthus palmeri*), ragweed (*Ambrosia* sp.), locoweed (*Astragalus* sp.), brome (*Bromus* sp.), and snakeweed (*Gutierrezia sarothrae*) (U.S. Fish and Wildlife Service 1998). Pronghorn will move in response to spatial limitations in forage availability (Hervert *et al.* 1997a). Water intake from forage is not adequate to meet minimum water requirements (Fox *et al.* 2000), hence pronghorn need and readily use both natural and artificial water sources (Morgart *et al.* 2005).

Sonoran pronghorn rut during July-September, and does have been observed with newborn fawns from February through May. Parturition corresponds with annual spring forage abundance. Within the endangered Arizona pronghorn range, fawning may occur throughout the range. Does usually have twins, and fawns suckle for about two months. Does gather with fawns, and fawns sometimes form nursery groups (U.S. Fish and Wildlife Service 1998). Sonoran pronghorn form small herds of up to 21 animals (Wright and deVos 1986).

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

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

C. Distribution and Abundance

United States

Endangered Wild Population

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

While Mearns (1907) suggested that pronghorn may have been common in some areas in the late 1800s, evidence suggests that the sub-population declined dramatically in the early 20th century. Sub-population estimates for Arizona, which only began in 1925, have never shown the pronghorn to be abundant (Table 1). Repeatable, systematic surveys were not conducted in Arizona until 1992. Since 1992, Sonoran pronghorn in the United States have been surveyed biennially (Bright *et al.* 1999, 2001) using aerial line transects (Johnson *et al.* 1991). Sub-population estimates from these transects have been derived using three different estimators (Table 2). Table 2 presents observation data from transects and compares estimates derived from the different population models from 1992 through 2006, plus other estimates 2008 to 2012. 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 1998, Bright *et al.* 2001).

High fawn mortality in 1995 and 1996 and the death of half (8 of 16) of the adult, radio-collared pronghorn during the 13 months preceding the December 1996 survey corresponded to five consecutive six-month seasons of below normal precipitation (summer 1994 through summer 1996) throughout most of the Sonoran pronghorn range, which likely contributed, in part, to observed mortality (Bright *et al.* 2001, Hervert *et al.* 1997b). Mortality of Sonoran pronghorn in 2002 was exceptionally high (Bright and Hervert 2005). At the start of the year, seven radio-collared Sonoran pronghorn were at large in the U.S. sub-population. By December 2002, all but one of these had died. For most, drought stress was considered to be the proximate cause. For those animals that may have succumbed to predation, it was suspected that drought stress was again a factor, by making the animal more vulnerable to predation, due to an emaciated physical condition and being forced into predator habitats by drought. The 2002 drought was one of the driest on record. As an example, annual rainfall at the OPCNM visitor center was only 2.54 inches in 2002 (Tim Tibbitts, Organ Pipe Cactus National Monument, personal communication 2002); average annual rainfall for the visitor center is 9.2 inches (Brown 1982). The November/December 2002 population survey revealed the U.S. sub-population had declined to the lowest level ever recorded. A total of 18 pronghorn were observed, in three groups (8, 9, and 1). The sightability model resulted in a population estimate of 21 animals, or a 79% decline from 2000. Also, very few fawns survived in 2002 to replace these dying adults.

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

to the U.S. population due to fences, Interstate 8, Mexico Highway 2, and other barriers. The rate of decline in the U.S. sub-population from 2000-2002 (79 percent) was also much greater than that observed in either the sub-population southeast of Highway 8 (18 percent decline) or the El Pinacate sub-population (26 percent) during the same period (see discussion of Mexican sub-populations in the next section). Observations of forage availability suggest the El Pinacate sub-population experienced the same severe drought that occurred on the Arizona side (T. Tibbitts, J. Morgart, personal communication 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 cross-border violator (CBV) traffic, smugglers, and required law enforcement response, as compared to what occurs in the El Pinacate area, was a likely contributing factor in the differing rates of decline observed north and south of the border.

The December 2004, 2006, 2008, 2010, and 2012 aerial surveys resulted in an estimated 58, 58, 68, 85, and 159, respectively, pronghorn in the U.S. endangered population (Tables 1 and 2), a substantial increase brought on by the implementation of ongoing recovery measures and improved range conditions since 2002. The 2006, 2008, and 2012 estimates included a number of captive-born individuals that were newly released into the wild (see below for more information on the captive breeding programs). During the 2008 and 2010 surveys, observers noted a skewed sex ratio (approximately 2:1) with more males than females; this affects the rate at which the population may increase.

Since 2002, when the Sonoran pronghorn population in Arizona declined to about 21 animals, recovery efforts of the Team and its partners have helped the wild population in Arizona increase nearly eight-fold. Key recovery actions include implementing captive breeding, waters, and supplement feeding programs, as well as operating forage enhancement plots. Although the U.S. Sonoran pronghorn population has increased significantly, until the most recent survey of 2012, the increase was not as great as the Team had predicted given the adequate to favorable range conditions since 2002, as well as the previously mentioned recovery efforts. Some members of the Team believe that this slow pronghorn population growth (caused by low fawn recruitment) is likely correlated with high CBV and U.S. Border Patrol (USBP) activity within the pronghorn range. Strong evidence of this correlation has been seen during the biennial aerial surveys where, since 2000, off-road vehicle tracks have been seen progressively increasing in extent and density, throughout the endangered pronghorn's U.S. range (electronic mail from Tim Tibbitts, Organ Pipe Cactus National Monument and member of the Sonoran Pronghorn Recovery Team, September 21, 2009). Between 2010 and 2012, the wild pronghorn population benefitted from better than average rainfall during 2011 and 2012 which resulted in a robust fawn crop of 78 fawns per 100 does during 2012.

In addition to the endangered population described above, a wild population is currently being reestablished at the Kofa NWR as an experimental, nonessential population under section 10(j) of the Act (see more detailed information below).

Semi-captive Breeding Facilities and 10(j) Wild Population

As part of a comprehensive emergency recovery program, a total of 11 adult pronghorn (10 females and one male) were initially captured (from Sonora and Arizona) and placed into a semi-captive breeding pen at CPNWR in 2004. The breeding program has been very successful and there are currently (as of January 2014) 61 pronghorn in the enclosure at CPNWR. Since establishing the program, about 19 pronghorn older than current year have died in the pen due to various causes, including one confirmed case of epizootic hemorrhagic disease, two from malnutrition prior to the introduction of alfalfa hay in the pen, two from bobcat predation, one from entanglement in the fence, and two from capture operations. Eight deaths were from unknown causes and although disease was suspected, it could not be confirmed.

Sonoran pronghorn have been released from the pen every year since 2006. As of January 2014, about 100 individuals have been released into the endangered population, many of which are known to still be alive.

The objective is to produce at least 20 fawns each year to be released into the current U.S. population, and to establish additional U.S. populations at Kofa NWR and BMGR East, east of Highway 85. The additional populations are being established as experimental, nonessential populations under section 10(j) of the Act. A final Environmental Assessment and final 10(j) rule (USFWS 2011) were published in April and May, 2011, respectively. See Figure 7 for a map of 10(j) Nonessential Experimental Population area for Sonoran pronghorn in southwestern Arizona. In December 2011, 13 Sonoran pronghorn were moved from the CPNWR breeding pen to the newly built breeding pen in the King Valley on Kofa NWR. One of the animals died due to capture myopathy and one died of unknown causes, leaving 11 (9 does and 2 bucks) in the pen for breeding purposes. In December 2012, 11 additional pronghorn were moved to the Kofa NWR from the CPWNR breeding pen, including two replacement breeder does for the Kofa breeding pen and nine pronghorn (three does and six bucks) for release into the wild. In September 2012, one adult doe was killed by a bobcat in the Kofa breeding pen. In December 2013, 16 additional pronghorn were moved to the Kofa NWR from the CPNWR, all of which were for release into the wild (one doe, however, had to be moved back into the breeding pen). As of February 2014, the Kofa pen contains 17 pronghorn.

Sonoran pronghorn have now been released in the King Valley on Kofa NWR in January 2013 (nine animals) and January 2014 (24 animals, including 9 from the Kofa pen and 15 from the CPNWR pen). Of the nine released in 2013, five are known to still be alive, one is unaccounted for. Three of these (two does and a buck) have been documented using a water source on the Yuma Proving Ground; most recently, in January 2014, they were documented near the Neversweat Mountains in King Valley. Two bucks released in 2013 were recaptured in the Kofa breeding pen because their collars prematurely failed and there was no way to track them. One of them was re-released in 2014. All 24 of the animals released in 2014 are still alive and nine wild-born fawns were documented in April. Therefore, in total there should be 27 wild adult pronghorn and nine fawns in the 10(j) population, as of April 2014.

Mexico

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

Sub-populations of Sonoran pronghorn in Sonora had not been thoroughly surveyed until the December 2000 surveys (Bright *et al.* 2001), at which time 346 pronghorn were estimated to occur in Sonora. Although the 1993 estimate was approximate, survey results suggested a decline in the sub-populations of 16 percent from 1993 to 2000 (Table 3). Since 2000, the two Mexico sub-populations have been resurveyed biennially, with the exception of the winters of 2004/05 and 2005/06, when they were surveyed both years, and the winter of 2013/2014 when the Pinacate sub-population could not be surveyed. In December 2002, a total (both El Pinacate and southeast of Highway 8) of 214 pronghorn in 32 groups were seen for a tentative population estimate of 280, indicating further decline. Only 19 pronghorn were observed in the Pinacate area for an estimate of 25, which is a decline of 26% from the 2000 estimate. Surveys conducted in December 2004 and February 2005 demonstrated that the

population southeast of Highway 8 increased to 625 (439 observed), while the Pinacate population increased to 59 (30 observed) (684 total estimated, 469 total observed). In 2004, several capture-related mortalities occurred in Sonora associated with efforts to capture pronghorn to stock the breeding pen in Arizona. Since then, capture protocols were examined and improved. In January 2006, surveys indicated that pronghorn numbers remained relatively steady with an estimated total of 634 (486 observed) individuals (combined for both populations). Nine of these were captured, of which five were fitted with radio-collars and released and four were transferred to the semi-captive breeding facility in the U.S.

In December 2007, surveys indicated pronghorn numbers declined with an estimated total of 404 (360 observed) individuals combined for both populations (including 354 pronghorn [325 observed] in the area southeast of Mexico Highway 8 and 50 [35 observed] to the west of the highway). Of these pronghorn, four pronghorn (three does and 1 buck) from the Pinacate Biosphere Reserve were captured and fitted with GPS radio collars. The male was found dead during a subsequent telemetry flight; his death was likely capture-related as his temperature rose dangerously high during the collaring effort. The decrease in Sonoran pronghorn population in Sonora from 2006 to 2007 is likely attributable, at least in part, to drought conditions in the pronghorn range in Mexico. During the aerial surveys, observers noted many extremely dry areas and some areas where the vegetation appeared dead in the pronghorn range. Additionally, an increasing number of fences and mine expansion within the range of the southeastern pronghorn population may be adversely affecting this population. In December 2009, surveys indicated pronghorn numbers increased somewhat with an estimated total of 482 (311 observed) individuals combined for both populations (including 381 pronghorn [258 observed] in the area southeast of Mexico Highway 8 and 101 [53 observed] to the west of the highway). In December 2011, surveys indicated pronghorn numbers drastically decreased with an estimated total of 241 (197 observed) individuals combined for both populations (including 189 pronghorn [167 observed] in the area southeast of Mexico Highway 8 and 52 [30 observed] to the west of the highway). In December 2013, surveys could not be conducted for the Sonoran pronghorn population west Mexico Highway 8 (Pinacate region) due to aircraft shortage; however, surveys of the population in the area southeast of Mexico Highway 8 indicated pronghorn numbers increased since 2011, with an estimated total of 434 (372 observed) (Table 3).

D. Threats

Barriers that Limit Distribution and Movement

Highways, fences, railroads, developed areas, and irrigation canals can block access to essential forage or water resources. Brown and Ockenfels (2007) report that numerous railroads and highways bisect what was former contiguous pronghorn habitat, often dividing these rangelands into parcels too small to support, viable, long-term populations of pronghorn in Arizona. Furthermore, they state railroads and paved highways are especially restrictive, as in addition to acting as intimidating barriers in their own right, they are often fenced on both sides of the right-of-way.

Highways 2 and 8 in Sonora, and SR 85 between Gila Bend and Lukeville, Arizona support a considerable amount of fast-moving vehicular traffic, are fenced in some areas, and are likely a substantial barrier to Sonoran pronghorn (one pen-raised radio-collared male crossed SR 85 and Mexican Highway 2; however, this is considered highly unusual). Interstate 8, the Wellton-Mohawk and Palomas Canals, agriculture, a railroad, and associated fences and human disturbance near the Gila River act as barriers for northward movement of pronghorn.

Canals have been the cause of six pronghorn deaths since 2008. Three pen-raised pronghorn drowned in the Palomas Canal in 2008, one pen-raised pronghorn drowned in the Wellton Canal in 2010, and two pen-raised pronghorn (part of the 10(j) population) died due to falling in the Wellton-Mohawk Canal in 2013 (specifically, one drowned and one died within days after being rescued from the canal).

De-watering of reaches of the Río Sonoyta and lower Gila River has also caused significant loss of habitat and loss of access to water (Wright and deVos 1986). Agricultural, urban, and commercial development at Sonoyta, Puerto Peñasco, and San Luis Río Colorado, Sonora; in the Mexicali Valley, Baja California; and at Ajo, Yuma, and along the Gila River, Arizona, have further removed habitat and created barriers to movement.

Vehicular Collision with Sonoran Pronghorn
Although vehicle collisions with Sonoran pronghorn are rare, it has been documented. An adult male pronghorn was struck and killed by a vehicle near kilometer post 29 on Mexico Highway 8 in July of 1996 (USFWS 2002). National Park Service records include a Sonoran pronghorn found dead just east of SR 85 along Ajo Mountain Drive in 1972. It was suspected to have been struck and killed by a vehicle (electronic mail from Tim Tibbitts, OPCNM, September 1, 2011). In 2003/2004 John Hervert (AGFD) investigated a Sonoran pronghorn mortality found a few hundred feet from Interstate 8. It had a broken leg, and so vehicle collision was suspected. In 2013, a doe was found dead east of Tacna on private property; based on initial examination it appears she may have been hit by a vehicle along a high speed dirt road. We are trying to open a USFWS investigation so that the animal can be sent to our forensics lab for further investigation.

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

Of the aforementioned human activities, in the U.S. range of the pronghorn, CBV activity and required law enforcement response is the most significant current source of disturbance to Sonoran pronghorn and its habitat. As a result of increased presence of the USBP in more developed areas, CBV traffic has shifted into remote desert areas, such as CPNWR, OPCNM, and BMGR (Klein 2000). In 2001, estimates of CBVs reached 1,000 per night in OPCNM alone (Organ Pipe Cactus National Monument 2001), and an estimated 150,000 people entered the monument illegally from Mexico (Milstead and Barns 2002). Apprehensions of CBVs in the USBP Tucson Sector-Ajo Station's Area of Responsibility peaked to 22,504 in 2006. However, after construction of the border vehicle fences on OPCNM in 2006 and CPNWR in 2009, apprehensions declined to 17,385 in Fiscal Year 2011. Illegal drive-throughs in particular declined after the construction of the fences. Since the SBI*net* towers and infrastructure became operational in late 2010 in the Ajo Station's Area of Responsibility, the number of apprehensions has increased. This increase is believed to be attributable to increased CBV activity, as well as increased USBP effort, tactical infrastructure, and technology in the area which have improved USBP's ability to detect and apprehend CBVs (personal communication with USBP, September 1, 2011).

In fiscal year 2005, the Yuma Sector of the USBP apprehended record numbers of CBVs, and from October 1, 2005 to May 2006, 96,000 arrests were made, which was a 13% increase over the same time

period in 2005 (Gerstenzang 2006). The Wellton Station of the Yuma USBP Sector made 2,080 apprehensions in fiscal year 2005 and 3,339 apprehensions from October 2005 to February 2006 (personal communication with USBP, February 10, 2006). USBP officials have indicated, however, that apprehensions in recent years have dramatically declined in the Yuma Sector, particularly in the western portions of the sector, due to USBP presence at Camp Grip, increased numbers of agents, and recently completed tactical infrastructure.

Both CBV and USBP activities have resulted in increased human presence in and widespread degradation of Sonoran pronghorn habitat. Much of the CBV traffic travels through the southern passes of the Growler Mountains that lead either through or by all of the forage enhancements and the captive rearing pen in the Child's Valley, with potential to impact these recovery projects and use of the area by pronghorn (personal communication with Curtis McCasland, CPNWR, 2007).

There is anecdotal evidence that pronghorn are avoiding areas of high CBV traffic and law enforcement activities (personal communication with Curtis McCasland, CPNWR, 2007). This may be especially true during periods of poor range conditions. For example, according to Customs and Border Protection (CBP) records, a drag road adjacent to the current Granite Forage Enhancement Plot (FEP) in the Wellton Station Area of Responsibility was created in 1996 and has been in use since before the FEP was installed. However, at the time the FEP was being planned, this was only a two-track trail with little use (electronic mail communication with John Hervert, AGFD, October 3, 2012). Wellton Station has confirmed that USBP use of this drag road has increased in recent years in response to an increase in illegal activities in the area. In spring of 2009, AGFD reported that they believe that three does with fawns abandoned the Granite Forage Enhancement Plot (FEP) due to the high amount of USBP activity at the site (electronic mail from John Hervert, AGFD, September 16, 2009). The does were later observed at OPCNM; however, the fawns died (electronic mail from John Hervert, AGFD, September 16, 2009). Instances such as these are more likely to occur during periods of poor range conditions and the impacts are likely exacerbated, regardless of the source of disturbance or impact on the pronghorn.

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

Another FOB, the Bates Well FOB, was exclusively occupied by USBP from 2005 to 2011. During the operation of the FOB, no pronghorn were documented entering the Valley of the Ajo through the Bates Well pronghorn migration corridor. The establishment of the FOB coincides with a drastic decline in pronghorn (attributable to drought and an increase in border activity); therefore, changes in use of Bates

Well area by pronghorn may be in part due to decreased population size, however the increased human presence at Bates Well, particularly during the fawning period, may have acted to prevent Sonoran pronghorn movements through the area and into the Valley of the Ajo. Even as the pronghorn population increased, they continued to avoid the Bates Well migration corridor while the Bates Well FOB was still in operation. Considering the sensitivity of pronghorn to human activity, it is likely that pronghorn avoided use of the area due to the high level of human activity currently associated with the site. During 2011, the USBP relocated the Bates Well FOB to a new site in the far western portion of the OPCNM along the ECDD at the CPNWR boundary. The new FOB is centrally located within the southern Growler Valley, an area that pronghorn generally avoid during the summer months. Since the Bates Well FOB was relocated, a holding pen for pronghorn releases was constructed near the site and in 2012 released pronghorn moved from that location back into the Valley of the Ajo.

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

It has been well documented that human presence in wildlands can disturb animals, causing them to unnecessarily expend energy avoiding people, thereby potentially reducing reproductive success (e.g., Manville 1983, van Dyke *et al*. 1986, Goodrich & Berger 1994, Primm 1996; as cited by Kerley *et al*. 2002) or increasing the likelihood of fatal encounters with humans (Kasworm & Manley 1990, Saberwal *et al*. 1994, Khramtsov 1995, Mattson et al. 1996; as cited by Kerley *et al*. 2002). Range abandonment has been documented in response to human disturbance (Jorgenson 1988), and investigators have shown that heart rate increases in wildlife in response to auditory or visual disturbance in the absence of overt behavioral changes (Thompson *et al.* 1968, Cherkovich and Tatoyan 1973, Moen *et al.* 1978).

Studies of captive pronghorn, other than the Sonoran subspecies, have shown that they are sensitive to disturbance such as human presence and vehicular noise. Human traffic, such as a person walking or running past pronghorn in an enclosed pen, a motorcycle driving past, a truck driving past, a truck blowing its horn while driving past, or a person entering a holding pen, caused an increased heart-rate response in American pronghorn in half-acre holding pens (Workman *et al.* 1992). The highest heart rates occurred in female pronghorn in response to a person entering a holding pen, or a truck driving past while sounding the horn. The lowest heart rates occurred when a motorcycle or truck was driven past their pen. Pronghorn were more sensitive to helicopters, particularly those flying at low levels or hovering, than fixed wing aircraft. Luz and Smith (1976) observed pronghorn reactions to overhead helicopter flights

which suggested mild disturbance (muscle tensing and interruption of grazing) by helicopter noise levels at approximately 60 dBA and strong reaction (running) at approximately 77 dBA.

Disturbances that cause pronghorn to startle and run would energetically have a more significant effect during times of drought. Such energetic expenditures, particularly during times of stress, may lead to lower reproductive output and/or survival of individual animals (Geist 1971). Landon et al. (2003) evaluated whether Sonoran pronghorn used areas, as defined by noise levels produced by military aircraft, in proportion to their availability on the BMGR. Using 15% of the Arizona Sonoran pronghorn population, they studied pronghorn use of areas with varying sound pressure (ambient sound) levels and found that pronghorn did not use the areas with different ambient sound levels in proportion to their availability. In general, they found that Sonoran pronghorn select areas with the lower noise levels and avoid areas with the higher noise levels; however, they did not consider habitat in their analysis. Whether pronghorn avoid these areas because of the noise or because of some other human-related factor is unknown; however, the various potential factors (i.e. noise levels, human presence, reduced vegetation or cover, disturbance) are interrelated. Hughes and Smith (1990) found that Sonoran pronghorn immediately ran 1,310- 1,650 feet from a vehicle, and that military low-level flights (less than 500 feet above the ground) over three pronghorn caused them to move about 330 feet from their original location.

Krausman et al. (2001, 2004, 2005) examined effects of military aircraft and ground-based activities on Sonoran pronghorn at the North and South tactical ranges (TACs) on the BMGR and concluded that military activities, both ground-based and aerial, were associated with some changes in behavior (e.g., from standing to trotting or running, or bedded to standing). In response to stimuli, on days without stimuli, pronghorn foraged more and bedded less than on days with stimuli; the opposite was true for fawns (Krausman et al. 2001). Krausman et al. (2001) only considered a change in behavior to trotting or running in response to stimuli as biologically significant. Eighty-seven (4.1%) of the 2,128 events with ground-based stimuli resulted in pronghorn changing their behavior to trotting or running; often moving > 10 m (Krausman et al. 2004). Pronghorn tend to exhibit a predator response to human activities, but can habituate to chronic human disturbance in some instances (Krausman et al. 2004). The authors concluded that these changes were not likely to be detrimental to the animals; however, sightings of Sonoran pronghorn were biased towards disturbed habitats on the TACs and other areas of military activities, which also corresponded to areas of favorable ephemeral forage production (Krausman et al. 2005). No specific conclusions could be drawn about effects of military activities on fawns during the Krausman et al. study, but the data suggests that fawns and their mothers may be more sensitive to anthropogenic stimuli than other pronghorn (Krausman et al. 2004). In general, the study did not detect differences in the behavior of pronghorn with and without anthropogenic stimuli; however, Krausman et al. (2004) recommends that all ground stimuli and activities that alerts or startles females and their fawns should be terminated. However, the long-term behavioral and physiological effects of military activities have not been quantified (Krausman et al. 2004).

Staff at OPCNM (2013) documented that during their typical morning activity period (post-sunrise), pronghorn on OPCNM experienced some form of potential disturbance once every 4 hours 10 minutes. Actual disturbance responses took place once every 6 hours 15 minutes. Potential disturbance events resulted in the pronghorn running, about once every 8 hours 20 minutes. Helicopter overflights took place once every 6 hours 15 minutes; one out of four overflights resulted in pronghorn running, and one in four resulted in vigilance (standing, alert, watching disturbance source). Vehicles approaching within one mile occurred once every 12 hours 30 minutes. Half of these resulted in pronghorn running, but for the other half, the driver was contacted by radio and advised to drive slowly (<10 mph) past the observation area. These observations only represent pronghorn and human activity in the first 3 hours after sunrise, in a specific area of OPCNM. Types and intensities of activities likely vary through the 24-hour cycle, and

across the landscape. These observations led to speculation that the levels of illegal border-related traffic in the area, and interdiction efforts, may have been sufficient to inhibit use of the area and 3-Jack Tank by Sonoran pronghorn.

Habitat Disturbance

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

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

As discussed above, CBV activities and required USBP response have resulted in increased human presence in remote areas and widespread habitat degradation. Prior to the completion of the vehicle fences on OPCNM and CPNWR (construction was started on these fences in late 2003 and 2007 and completed 2006 and 2009, respectively), CBVs frequently crossed the border in vehicles and created countless illegal routes, many of which were continuously used both by CBVs and responding USBP agents. Subsequent to the construction of the vehicle fences on OPCNM and CPNWR, CBV vehicular traffic was significantly reduced (there are occasional breaches in the fence; however, this CBV vehicular activity represents a fraction of that prior to the presence of the fences). NPS notes that CBV vehicle activity has decreased at OPCNM since about 2004 (electronic mail, Tim Tibbitts, OPCNM, 2009 and 2011); however, the number of off-road tracks, and new unauthorized vehicle routes (UVR) in OPCNM continues to increase (electronic mail, Tim Tibbitts, OPCNM, September 1, 2011). Decreased CBV vehicle traffic in pronghorn habitat as a result of the fences has alleviated the adverse effects of this traffic on pronghorn and their habitat. USBP, however, continues to respond (by vehicle, horseback, foot, and aircraft) to ongoing CBV activity in these areas. Frequently, this required response involves driving off of authorized roads which, when conducted in pronghorn habitat, results in significant degradation of pronghorn habitat and disturbance to pronghorn as discussed above. For instance, all the valleys at CPNWR and OPCNM are now criss-crossed with a network of unauthorized vehicle routes and trails, even though those areas are designated as Wilderness. A mapping effort conducted by CPNWR showed almost 8,000 miles of unauthorized routes as of 2008. A mapping effort conducted by OPCNM documented the following number of miles on each land management unit from 2008 to 2010: 7876.2 on CPNWR, 1209.8 on OPCNM, and 240.9 on the BLM Ajo Block. Unauthorized route creation continues to occur on all three of these important pronghorn areas. The proliferation of unauthorized vehicle routes is a major impact on multiple resources, and provides an index of the level of human activity currently taking place in pronghorn habitat.

A cooperative effort was completed recently by CBP, USFWS, NPS, and BLM to map and mark roads within the range of the Sonoran pronghorn to indicate those roads that are open for use by these agencies,

and roads that are closed to vehicle traffic. It is hoped that this effort will reduce the use of unauthorized and the associated impacts to Sonoran pronghorn. To date, it does not appear that the map is functioning as intended.

Fire

The winter and spring of 2004/2005 were very wet, resulting in some of the highest productivity of cool season annual plants in recent memory. As these annual plants dried out, they created fuel for wildfire. In 2005, Mediterranean grass combined with high densities of the native wooly plantain (*Plantago ovata*) and other species created fuels adequate to carry fire. Military training, such as strafing and bombing in the tactical ranges, as well as fires set by CBVs, provided the ignition sources. Exact numbers are unknown; however, in 2005 roughly 7,500 acres of pronghorn habitat burned on the CPNWR (personal communication with Curtis McCasland, CPNWR, February 15, 2006) and more than 63,000 acres burned on the BMGR-East during that time. Approximately 29,260 acres of pronghorn habitat burned as a result of these fires.

Most Sonoran Desert trees, shrubs, and cacti are poorly adapted to fire (Brown and Minnich 1986, Schwalbe *et al.* 2000, Alford and Brock 2002). If areas burn repeatedly, permanent changes are likely in the flora. Even in the best scenario it is likely to be many years before trees once again provide thermal cover in wash communities and cholla recover to a point that they are useful forage plants for pronghorn. This said, from 2007 to 2010 pronghorn were attracted to the burned areas, which often supported better growth of annual plants and forbs than adjacent unburned areas. However, in the long term and if these areas continue to burn, removal of thermal cover (trees) and chain fruit cholla, which they depend on in drought, would likely adversely affect pronghorn and probably limit the use of these areas to wetter and cooler periods and seasons.

Drought and Climate Change

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

Historically, pronghorn populations must have weathered severe droughts in the Sonoran Desert, including many that were more severe and longer term than what has occurred recently. Given that pronghorn populations survived the droughts of the 1890s, 1950s, 1970s, and others before those, it is unreasonable to solely attribute declines in the U.S. pronghorn population to drought. OPCNM (2001) concluded, “If (individual) recent dry years have had an impact on Sonoran pronghorn, it is most likely

because in recent decades Sonoran pronghorn have much more limited options for coping with even brief moderate drought. Because of restrictions on their movements and range, and increasing human presence within their range, pronghorn are less able to employ their nomadic strategy in search of relief. It is not that drought itself is an impact, but possibly that drought has *become* an impact, due to other factors confounding the species' normal ecological strategy."

Small Population Size and Random Changes in Demographics
In populations of fewer than 100 pronghorn, population viability declines at an increasingly steep rate. To maintain genetic diversity over the long term, a population of at least 500 is desirable (Defenders of Wildlife 1998). At an estimated 21 pronghorn in 2002, the U.S. wild endangered population was critically endangered and likely experienced a substantial loss of genetic diversity resulting from the 2002 bottleneck. At an estimated 159 pronghorn in 2013, the U.S. wild endangered population has dramatically increased but is still below desired numbers. At an estimated 25 pronghorn in 2002 and 52 pronghorn in 2011, the Pinacate population is also well below desired numbers. At an estimated 434 pronghorn in 2013, the third population (southeast of Highway 8) is much closer to, but still below the desired size to maintain genetic diversity. Loss of the U.S. population would dramatically reduce our ability to manage or recover this subspecies. Populations at low levels may experience random variations in sex ratios, age distributions, and birth and death rates among individuals, which can cause fluctuations in population size and possibly extinction (Richter-Dyn and Goel 1972). In very sparse populations, males may have trouble finding females, reducing productivity (Ehrlich and Roughgarden 1987). Small populations are also sensitive to variations in natural processes, such as drought and predation (Hecht and Nickerson 1999).

Disease
Sonoran pronghorn can potentially be infected by a variety of viral and bacterial diseases, as well as parasites. Epizootic hemorrhagic disease and Bluetongue virus are the most common cause of disease caused die-off in wild pronghorn (Brown and Ockenfels 2007). Blood testing has shown pronghorn exposure to these diseases by increases in antibody titers over time. The diseases relevant to pronghorn can be transmitted indirectly through vectors, such as infected midges or ticks, or directly via aerosolized or direct contact of infected fluids or tissues. Diseases that potentially infect pronghorn are all serious diseases of cattle, which can act as vectors. Cattle within the current range of the pronghorn have not been tested for these diseases.

E. Recovery Actions

A number of critically important recovery projects have been implemented in an attempt to reverse the decline of the U.S. endangered population of the Sonoran pronghorn. These projects are designed to increase availability of green forage and water during dry periods and to offset to some extent the effects of drought and barriers that prevent pronghorn from accessing greenbelts and water, such as the Gila River and Río Sonoyta. Many developed and nine emergency water sources (six on CPNWR, one on OPCNM, and two on BMGR West) have been constructed in recent years throughout the range of the U.S. endangered population. Additionally, within the past two years, three permanent catchments for Sonoran pronghorn were constructed in the non-wilderness portion of CPNWR (one) and the BMGR East (two). Additionally, one existing water (Sierra Pinta # 3) within the refuge was recently redeveloped resulting in increased storage capacity from 1,800 gallons to over 10,000 gallons. In 2015, one new water for Sonoran pronghorn within the refuge will be constructed (Agua Dulce # 2) and one existing water (Fawn Hills) will be redeveloped to increase storage. Five forage enhancement plots, each consisting of a well, pump, pipelines and irrigation lines, have been developed to irrigate the desert and produce forage for pronghorn. Additionally, starting in 2009, temporary, experimental feed and water stations were placed strategically within the South TAC to enhance pronghorn fawn survival and recruitment during

periods of prolonged drought. The primary purpose was to draw pronghorn away from active military targets as an offset to the target closure distances that were in place at that time. These stations were heavily used by pronghorn during times with poor range conditions brought on by drought.

Plots and waters located in areas with little human activity and better range conditions appear to be more effective (i.e., contribute to fawn and adult survival to a greater degree) than those located in areas of high human activity and poor range condition (i.e., experiencing drought) (personal communication with John Hervert, AGFD, September 16, 2009). Therefore, to ensure success of these measures, it is critical that human activity is avoided or significantly minimized near the plots and waters.

A semi-captive breeding facility at CPNWR was first stocked with pronghorn in 2004; as of January 2014, it contains 61 pronghorn. As described above, these facilities are being used to augment the current U.S. population and the new population north of I-8, as well as to establish additional herds elsewhere within suitable portions of historical range in Arizona and potentially in southeastern California. These crucial projects, which are helping pull the U.S. population back from the brink of extinction, have been cooperative efforts among many agencies and organizations, including USFWS, AZGFD, MCAS-Yuma, Luke Air Force Base (LAFB), OPCNM, CBP, Arizona Desert Bighorn Sheep Society, Arizona Antelope Foundation, the Yuma Rod and Gun Club, the University of Arizona, the Los Angeles and Phoenix Zoos, and others.

ENVIRONMENTAL BASELINE – SONORAN PRONGHORN

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

A. Action Area

The “action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. For the purposes of this consultation, as described in the BE, the action area includes all of YPG and Kofa NWR. The 10(j) population on YPG, Kofa NWR, and surrounding areas is separated from the endangered U.S. population by Interstate 8 and extensive farming along the Gila River Valley.

Management of the action area is entirely by Federal agencies. The YPG encompasses over 838,000 acres and is managed by U.S. Army Garrison YPG for military testing and training. Kofa NWR encompasses 665,400 acres and is managed by the USFWS for desert bighorn sheep and other native wildlife and their habitat.

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

The action area is included in the Lower Colorado River Valley Subdivision of the Sonoran Desertscrub Biome. The typical plant species that inhabit the action area include microphyllous trees like western honey mesquite (*Prosopis glandulosa*), ironwood (*Olneya tesota*), foothill and blue palo verde (*Parkinsonia microphylla* and *P. floridum*), and smoketree (*Psorothamnus spinosa*). In dryer and more barren areas the more common desert pavement plants are creosotebush (*Larrea tridentata*), white

bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), teddy bear cholla (*Cylindropuntia bigelovii*), and saguaro (*Carnegiea gigantea*).

Vegetation on YPG is adapted to the hot, arid environment, where summer daytime temperatures can exceed 120 degrees Fahrenheit (Spellenberg, 2003). Open plains are sparsely covered with drought-tolerant shrubs, grasses, and cacti. The most common plant species on YPG is creosote bush, which occurs over large areas or mixed with combinations of ocotillo, white bursage, teddy bear cholla cactus, and foothill palo verde trees, depending on landscape position.

Areas of sandy soil support big galleta communities that include foothills palo verde, honey mesquite, or bursage. The hillsides of YPG typically support brittlebush and other plants including various cacti (such as saguaro, cholla, and prickly pear). Saguaro cacti on YPG are less numerous and more scattered than in the eastern Sonoran Desert. The foothills and mountainous areas typically support a mixed shrub community. The desert washes typically support a variety of woody plants, including palo verde, ironwood, smoketree, mesquite, and catclaw acacia (*Senegalia greggii*). Larger washes support bosques of smoketree, mesquite, ironwood, and palo verde.

At YPG, vegetation density noticeably decreases downstream of bajadas heavily impacted by military training, testing, and infrastructure. Bajadas are typically covered with well-developed desert pavement. Vegetation densities on YPG are also decreasing in first order rills downstream from unimpacted areas, indicating that natural desert conditions may be changing. Therefore, changes in desert vegetation are likely due to natural and anthropogenic forces (McDonald et al., 2004).

Non-native invasive species occur on YPG, including buffelgrass, Athel tamarisk (*Tamarix aphylla*), salt cedar (*Tamarix* spp. and hybrids), Mediterranean and Arabian grass (*Schismus arabicus*), Mediterranean grass, Sahara mustard, and puncturevine (*Tribulus terrestris*). Although buffelgrass only occurs in a few scattered locations, its potential for spread in favorable rainfall years and for carrying ecosystem-changing fires make it YPG's current weed of greatest concern. These invasive grasses and Sahara mustard increase fuel loads and carry fire well, resulting in larger and more intense wildfires. Sahara mustard skeletons blow in the wind and may pile up along fence lines in masses up to 10 feet high. According to YPG, Sahara mustard is considered the most detrimental non-native species on YPG due to its impact on wildlife, native plants, and potentially the mission of YPG (YPG 2014). Many native vegetation species are poorly adapted to fire and the intense wildfires can result in drastic changes to the vegetation.

Climate is characterized by extreme aridity, mild winters, and hot summers. Approximately 2.7 inches of precipitation fall annually at Yuma, with slightly more than half of this occurring in the winter months (Brown 1982). On YPG precipitation rarely exceeds the amount required to infiltrate below surface horizons, and runoff from adjacent piedmonts, especially along channels, is needed to augment the moisture plants receive from other sources.

C. Status of the Sonoran Pronghorn in the Action Area

Distribution, Abundance, and Life History

The life history of Sonoran pronghorn in the action area is the same as that described above in the Status of the Species for the U.S. sub-population. Sonoran pronghorn historically occurred in valleys around the lower Gila river, likely including the King Valley within Kofa NWR until the early 1800’s or early 1900’s, although little information population size and specific areas used exists (Brown and Ockenfels 2007, Brown 2008). As described in detail above in the Status of the Species, as of April 2014, there are 27 wild adult pronghorn and nine fawns in the 10(j) population (herein referred to as the Kofa

population). Based on telemetry locations in 2013 and 2014, Sonoran pronghorn are primarily using the King Valley of Kofa NWR, as well as the southern part of the King Valley on YPG (Figure 8). There are a number of pronghorn detections in other areas, including to the east and southeast of YPG. The Sonoran pronghorn distribution on YPG, Kofa NWR, and surrounding areas is likely to change as pronghorn continue to become established and more telemetry data is collected.

The pronghorn on YPG have been observed using man-made ponds (SWTR pond and Ivan's Well) on the eastern portion of the Kofa range which is located toward the southern end of King Valley. These ponds are maintained to supply water for dust suppression or construction and maintenance activities on YPG. They are not fenced and are frequented by deer, horses, coyotes and other wildlife. Camera traps detected the pronghorn using the SWTR facility multiple times in June, August and September of 2013. No observations of pronghorn occurred in July and October 2013 due to camera failures. Pronghorn were first observed on Ivan's well in March and April 2014.

We are only beginning to gather data on distribution and habitat use of the Kofa population of Sonoran pronghorn. However, based on Sonoran pronghorn habitat use patterns on Cabeza Prieta, and the limited historical records on Kofa NWR and YPG, we anticipate they will use the lowland desert habitat in the valley bottom and lower bajadas within King Valley (U.S. Fish and Wildlife Service 1998 and 2001). According to a model by USFWS, there are 7,405 square miles of potential habitat for Sonoran pronghorn within the nonessential experimental population area A (Figure 7)(USFWS 2010). According to this same model, about 58 percent of YPG (approximately 757 square miles) is potentially suitable habitat for Sonoran pronghorn (USFWS 2010).

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

The Status of the Species section describes a variety of human activities that have affected the Sonoran pronghorn since initiation of livestock grazing over 300 years ago (Officer 1993). Many non-Federal activities that have affected the pronghorn are historical in nature, and pronghorn have been all but extirpated from private, state, and Tribal lands. As explained in the Status of the Species, highways, fences, railroads, developed areas, and irrigation canals can block access to essential forage or water resources. Highways and railroads can also lead to vehicular and train collisions with Sonoran pronghorn. Additionally, canals can lead to Sonoran pronghorn drowning.

E. Past and Ongoing Federal Actions in the Action Area

Because the action area is comprised of Federal lands, most activities that affect the Kofa pronghorn population or their habitat are Federal actions. The primary Federal agencies involved in activities in the action area include the YPG and Kofa NWR. No formal section 7 consultations have been completed within the action area, although we anticipate formally consulting with Kofa NWR in the near future on activities on Kofa NWR that may affect Sonoran pronghorn. Because the 10(j) population is treated as a species proposed to be listed for section 7 consultation purposes, only actions affecting pronghorn on Kofa NWR need to undergo section 7 consultation.

EFFECTS OF THE PROPOSED ACTION

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

Effects of ongoing and proposed activities on Sonoran pronghorn on Kofa NWR can generally be segregated into effects of aerial operations and effects of ground-based operations. In response to military overflights, pronghorn may exhibit a startle response or may flush from cover (Krausman *et al.* 2001, Hughes and Smith 1990, Workman *et al.* 1992, Luz and Smith 1976). Pronghorn may alter use of areas to avoid aircraft noise or disturbance (Bleich *et al.* 1990, Krausman *et al.* 1986), or may exhibit other physiological or behavioral responses that could be detrimental (Bowles 1995, Norrix *et al.* 1995, Stockwell and Bateman 1987, Berger *et al.* 1983). Ground-based activities can destroy or degrade forage and cover, and result in behavioral or physiological changes that may be detrimental (Geist 1971, Freddy *et al.* 1986, Workman *et al.* 1992).

The Sonoran pronghorn is sensitive to human presence. Krausman *et al*. (2001) reported that Sonoran pronghorn reacted to ground disturbances (vehicles or people on foot) with a change in behavior 37 percent of the time, resulting in the animals running or trotting away 2.6 percent of the time. The effects of disturbance from vehicular use of roads on Sonoran pronghorn were a more significant impact than disturbance from aircraft (helicopter, jet, and fixed wing) (Krausman *et al*. 2001). Wright and deVos (1986) noted that Sonoran pronghorn exhibit “a heightened response to human traffic” as compared to other subspecies of pronghorn. They noted that “once aware of an observer, Sonoran pronghorn are quick to leave the area. One herd was observed 1.5 hours later 11 miles north of the initial observation in October 1984. Other pronghorn have run until out of the observer’s sight when disturbed.” Hughes and Smith (1990) noted that on all but one occasion, Sonoran pronghorn ran from the observer’s vehicle and continued to run until they were out of sight. Krausman *et al*. (2001) documented 149 direct overflights and 263 other overflights (in which the aircraft passed ≥328 feet to the side of the animal). Pronghorn changed their behavior (e.g., from standing to trotting or running, or bedded to standing) 39 and 35 percent of the time during direct and other overflights, respectively.

Staff at OPCNM (2013) documented that during their typical morning activity period (post-sunrise), pronghorn on OPCNM experienced some form of potential disturbance once every 4 hours 10 minutes. Actual disturbance responses took place once every 6 hours 15 minutes. Potential disturbance events resulted in the pronghorn running, about once every 8 hours 20 minutes. Helicopter overflights took place once every 6 hours 15 minutes; one out of four overflights resulted in pronghorn running, and one in four resulted in vigilance (standing, alert, watching disturbance source). Vehicles approaching within one mile occurred once every 12 hours 30 minutes. Half of these resulted in pronghorn running, but for the other half, the driver was contacted by radio and advised to drive slowly (<10 mph) past the observation area.

Preliminary information from a study on the effects of human disturbance on Sonoran pronghorn indicates that pronghorn consistently exhibit visual responses to human activity, particularly vehicles traveling on a road within several kilometers. Although some instances have been noted where a pronghorn did not exhibit a visual response (for example, one buck did not appear disturbed by three

vehicles driving at least 25 miles per hour about 1.5 kilometers away); most observations indicate that pronghorn exhibit a spectrum of responses, from standing vigilant to running from the stimulus. For example, eight Sonoran pronghorn were observed running a short distance and then vigilant towards utility vehicle noise 3.4 kilometers away. Another eight Sonoran pronghorn were observed running from several trucks traveling fast (> 25 mph). Pronghorn were initially vigilant when the vehicles were 1.3 kilometers away but soon started running, travelling over 3.6 kilometers in under five minutes until they were out of sight of the observers (email from Stephanie Doerries, University of Arizona, May 7, 2014).

Disturbance and flight of ungulates are known to result in a variety of physiological effects that are adverse, including elevated metabolism, lowered body weight, reduced fetus survival, and withdrawal from suitable habitat (Geist 1971, Harlow *et al*. 1987). Frequent disturbance imposes a burden on the energy and nutrient supply of animals (Geist 1971), which may be exacerbated in harsh environments such as those occupied by Sonoran pronghorn. Human presence may cause Sonoran pronghorn to move from an area, thereby denying pronghorn access to that specific site for what may be crucial ecological functions (e.g. foraging, bedding, seeking thermal shelter, seeking mates, seeking fawning sites, seeking areas of relative safety from predators). Causing pronghorn to move also increases their physiological demands by expending calories and metabolic water. These may be critical stressors in seasonal hot-dry periods and in extended periods of low forage availability. Disturbance may also lead to mortality. Causing a pronghorn to be alarmed or agitated, or to flee from a disturbance, may also make it vulnerable to predator attack. This is especially true for fawns and females during the fawning season. Krausman *et al*. (2001) found that fawns and their mothers were more sensitive to human disturbance than other life stages of Sonoran pronghorn.

Adverse effects to Sonoran pronghorn on Kofa NWR from YPG activities include visual and auditory disturbance by aircraft flying over the refuge, munitions being detonated near the refuge boundary, or human and vehicular presence near the boundary of the refuge. Wildfire may also directly or indirectly affect Sonoran pronghorn on the refuge in the event that wildfire encroaches from YPG onto the refuge.

<u>Effects of Aerial Operations</u>

Aircraft overflights of Kofa NWR may cause intermittent visual and auditory disturbance of Sonoran pronghorn. Most fixed wing aircraft flights in the airspace above Kofa NWR in the King Valley Area (**R-2308A**) occur between 8,000 and 32,000 feet AGL; due to their high altitude (noise from the aircraft is significantly reduced by the time it reaches the ground) these flights are not expected to disturb pronghorn. The lower limit of YPG airspace within R-2308A on Kofa NWR is 1,500 feet AGL; however, the YPG ONMP recommends that pilots remain at least 2,000 feet AGL. Currently, flights very rarely fly this low over Kofa NWR. Although noise from these lower level flights is not completely attenuated by the time it reaches the ground, it is reduced to the point of background noise and therefore not expected to elicit substantial reactions from Sonoran pronghorn. Furthermore, aircraft do not hover over the refuge, but pass by. This helps reduce potential auditory and visual disturbance to pronghorn as well. The potential effects of helicopter use in R-2308A are discussed below.

Airspace **R-2307** covers the YPG Kofa Firing Range and the southern portion of the Kofa NWR and ranges from surface to unlimited altitude. Specifically, airspace R-2307 overlaps the refuge along the southern portion of the Castle Dome Mountains, west of King Valley. The rough terrain of the mountains reduces the quality of habitat for pronghorn; however, pronghorn could pass through the valleys or occupy the foothills and valleys at the base of the mountains. Although low level flights may disturb pronghorn occurring in airspace R-2307 over the refuge, because fixed wing flights seldom occur at low

levels, we anticipate disturbance from these flights will be a rare event. The potential effects of helicopter use in R-2307 are discussed below.

Helicopters use, particularly low level flights, in R-2307 and R-2308 over Kofa NWR have higher potential to disturb pronghorn than fixed wing flights due to their rotor noise, hovering, and low flight capabilities. Low level helicopter flights in R-2308 and R-2307 over the Kofa NWR are rare; however, helicopters used in conducting safety sweeps of the refuge (primarily in R-2307) will likely be flown at low altitudes. These flights may startle pronghorn and cause them to flee. However, because these sweeps 1) will occur mostly over mountainous terrain where habitat is less desirable for pronghorn, and 2) are anticipated to infrequently occur, we anticipate that disturbance from these flights should be rare.

Operation of existing drop zones on the Cibola range should have no impact to Sonoran pronghorn on Kofa NWR due to their distance from the refuge. However, operation of the new drop zone in the King Valley near Kofa NWR (identifier K002, Figure 2a and 2b) may disturb pronghorn on Kofa NWR due to its proximity to the refuge. Flights associated with aerial delivery at the new drop zone should have minimal effects on pronghorn behavior due to the elevation of the flights, as explained above. Vehicles (ranging from utility vehicles to flatbed trucks or truck mounted cranes) associated with load recovery and placement and pick up of instrumentation at or near the new drop zone may intermittently disturb and cause behavioral changes in Sonoran pronghorn on Kofa NWR.

Effects of Ground-based Operations

Effects of Munitions

A number of ground-based activities, including munitions firing and YPG response to munitions that accidentally land on Kofa NWR, may injure/kill or disturb Sonoran pronghorn or may degrade their habitat on Kofa NWR. Munitions firing or ordnance deliveries could injure or kill Sonoran pronghorn on Kofa NWR; however, this is highly unlikely as all munitions firing or ordnance deliveries occur on YPG (not within Kofa NWR) and the impact area boundary within potential pronghorn habitat is located about one kilometer south of the Kofa NWR boundary. SDZs occasionally encroach onto Kofa NWR and munitions may be fired over parts of the refuge following the conditions established for the buffer area. However, YPG carefully plans each shot on the range with consideration of the gun position from which ordnance is fired to the target or impact area. Test directors take into account the capabilities and past performance of the ordnance and blast radius to develop a SDZ in which the munitions could inadvertently land. As a result of these precautions, the likelihood of ordnance landing within the refuge is low and the likelihood of munitions hitting and injuring or killing Sonoran pronghorn is even lower given that they regularly move and are not fixed on the landscape.

In the rare event that munitions fall onto Kofa NWR (the algorithm used to establish the dimensions for the safety fan uses a 1/1,000,000 probability of munitions landing outside the fan), YPG will coordinate with Kofa NWR to remediate the impacts as soon as possible. YPG's remediation response, which would involve personnel and vehicles, could disturb Sonoran pronghorn depending on where the munitions fall and the access route taken to reach the munitions; however, the potential disturbance should not only be a rare occurrence, but it should also be relatively brief. The remediation response could also result in minor degradation of Sonoran pronghorn habitat depending on where the munitions fall. YPG is committed to ensuring that impacts to Sonoran pronghorn are avoided to the extent possible.

Munitions firing may cause auditory disturbance to Sonoran pronghorn on the refuge. Explosions from munitions testing and training on YPG in the Castle Dome Mountains along the western and southern boundary of Kofa NWR would be audible to pronghorn in portions of the area they may occupy. Because

munitions testing and training is relatively constant in this area and because noise is reduced by the time it reaches Kofa NWR, Sonoran pronghorn likely become habituated to such noise and are less likely to exhibit startle responses as a result of it. That said, no pronghorn observations have been made in the southern end of the refuge during munitions training and testing, so their responses and reactions are unknown at this time.

Expansion of the munitions impact area from northern boundary of existing impact areas Echo and Foxtrot to the northern boundary of the Ramsdell Ranch impact area and the area previously contaminated by unexploded ordnance (identifier K003; Figure 2a and 2b), which is about one kilometer south of the Kofa NWR southern boundary, may cause increased visual and auditory disturbance to Sonoran pronghorn on Kofa NWR. Expanding the available munitions impact area will not result in increased frequency of munitions firing, however, it will result in addition impacted areas on YPG. Additionally, there will be an increase in the area available for people to enter and use for target placements, establishment of temporary gun positions or observation points, impact testing, and ordnance recovery purposes (people enter impact areas per mission requirements). Increases in human activity in the expanded impact area may occur if there are increases in demand for testing.

While munitions firing can cause habitat degradation in the impact zone, it is highly unlikely that Sonoran pronghorn habitat on Kofa NWR will be impacted by munitions due to the very small risk of munitions landing on the refuge. That said, munitions firing could degrade Sonoran pronghorn habitat on Kofa NWR as a result of fire starting on YPG (from munitions) and spreading to the refuge. Most fires on YPG are very small and isolated due to the sparse nature of fuels in this region. From 2003 to present, there were an estimated 26 fire starts on YPG and a total of 3,170 acres burned on YPG. Of that total, 3,000 acres was from one event, the King Valley Fire in September 2005. The King Valley Fire, ignited due to munitions impact on YPG, is the only major documented fire originating on YPG in over 70 years of military testing and training activities. In addition to burning 3,000 acres on YPG, it burned 26,000 acres on Kofa NWR for a total of about 29,000 acres. This type of fire event is only made possible by exceptional amounts of precipitation and resulting vegetation growth. Although this type of fire is rare, in the event that one occurs again during the life of the proposed action, a significant amount of Sonoran pronghorn could be temporarily impacted by such an event. Fires may affect vegetation composition, as well as temporarily reduce cover and forage quantity and quality. Reduced cover could lead to increased predation of fawns. Additionally, wildfire may temporarily displace Sonoran pronghorn and could injure or kill fawns if they are too young to flee the oncoming fire. Although fire can cause many temporary adverse effects to Sonoran pronghorn habitat, over a longer time period, fire can cause increases in annual forbs and lengthen the green-up period which is beneficial to Sonoran pronghorn. To reduce the risk of wildfires spreading, since the 2005 King Valley Fire, YPG has adopted more effective communication protocols in responding to fires.

Effects of Light Training Areas

Expansion of an LTA (identifier K026, Figures 2 a and 2b) to support operational testing and dismounted maneuver training at Smart Weapons Test Range (SWTR) may disturb Sonoran pronghorn on Kofa NWR due to the proximity of the expansion to the refuge. Human activities (up to 120 troops may train at an LTA), vehicles, generators, and staging of equipment associated with training activities at the expanded LTA may result in visual and auditory disturbance of pronghorn on Kofa NWR possibly causing them to startle or run.

Effects of Electronic Warfare/Communication/Sensor Testing and Observation Points

Testing of electronics systems and use of observation points may intermittently disturb Sonoran pronghorn on Kofa NWR. People and vehicles associated with these activities, should they occur near or

adjacent to the refuge may cause pronghorn to startle or run; however, we do not anticipate that these activities will occur frequently near the Kofa NWR boundary.

Effects of Facilities Construction, Operation, and Maintenance

Construction activities, including vehicular and equipment access and human activity, associated with new utility lines and testing instrumentation near the new drop zone northeast of East Smart Weapons Test Range (SWTR) Impact Area (identifier K002; Figure 2a and 2b) may temporarily disturb Sonoran pronghorn on Kofa NWR due to their proximity to the refuge. Testing instrumentation will likely only take a couple of days to establish; however, it is not known how long utility line construction will take. Establishing the drop zone itself requires no construction. Disturbance associated with operation of the drop zone will be ongoing and is discussed in the Effects of Aerial Operations section above. Construction and operation of an aircraft shelter, multiple buildings, water tank, storage area for petroleum products, and graded parking area, as well as clearing of a launch/recovery area at SWTR (identifier K004-a, Figure 2a and 2b) may also disturb Sonoran pronghorn on Kofa NWR due to their possible proximity to the refuge (the exact location of the construction is not currently known, but may be within a few kilometers of the southern boundary of Kofa NWR). According to the BE, the construction will occur in an area where current human activity is already high, so activities associated with the construction and operations of these facilities may not have a significantly greater effect on Sonoran pronghorn on Kofa NWR than existing activities at the site. The additional effect is difficult to quantify because background levels of human activity at the site as well as increases in the amount of human activity associated with construction and operations of the new facilities were not provided in the BE. Overall, given that construction and operation of the facilities will not occur adjacent to Kofa NWR, it is unlikely that these activities will significantly alter Sonoran pronghorn behavior on the refuge.

Maintenance of range infrastructure such as observation points, utilities, and roads occurs throughout YPG and may disturb Sonoran pronghorn on Kofa NWR due to the proximity of some of these maintenance activities to Kofa NWR. Human and vehicular activities associated with routine maintenance of roads and utilities in particular have the greatest likelihood of visually or auditorily disturbing pronghorn due to the proximity of some roads and utilities to Kofa NWR. Such disturbance will be intermittent but continuous for the life of the project.

Effects to Sonoran Pronghorn Recovery with the Project

As stated in the “Status of the Species” section above, current downlisting criteria for Sonoran pronghorn are: 1) the establishment of a population of 300 adult pronghorn in one self-sustaining population for a minimum of five years; and 2) the establishment of at least one other self-sustaining population in the U.S. Currently, there are no delisting criteria. The proposed action will not affect the first downlisting criteria because the effects of the project do not extend into the endangered Sonoran pronghorn range, the population with the downlisting requirement of 300 adult pronghorn. The proposed action may affect the second downlisting criteria. For example, activities on YPG may disturb, injure, or kill pronghorn, as well as degrade their habitat. YPG activities with such an effect could limit the establishment of Sonoran pronghorn in certain areas of the nonessential experimental population or 10(j) boundary, particularly on YPG. That said, the Sonoran Pronghorn Recovery Team was aware of these activities when planning for the establishment of a second pronghorn population in Arizona and ranked the area (Area A, see Figure 7 and USFWS 2010 and 2011) as the highest priority area to establish a second viable Sonoran pronghorn population in Arizona. Although the proposed action may affect establishment of a second Arizona pronghorn population, we do not anticipate it will preclude the second recovery criteria due to the availability of potential Sonoran pronghorn not impacted or minimally impacted by YPG activities within

Area A of the nonessential experimental population boundaries. In other words, it is highly likely that a self-sustaining Sonoran pronghorn population will be established on Kofa NWR and surrounding areas even with the impacts of the proposed action. As such, we do not anticipate that the proposed action will preclude downlisting of Sonoran pronghorn. Because delisting recovery have not been established, it is difficult to analyze the potential impacts of the proposed action on Sonoran pronghorn recovery (delisting). However, because YPG activities should have no effect to Sonoran pronghorn within Area A outside of YPG and Kofa NWR and only minimal effects to Sonoran pronghorn on Kofa NWR, it is our opinion that recovery of Sonoran pronghorn will not be precluded by the proposed action.

CUMULATIVE EFFECTS - SONORAN PRONGHORN

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The lands within the action area are managed by Federal agencies (YPG and Kofa NWR); thus, most activities that could potentially affect pronghorn on Kofa NWR are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects.

CONCLUSIONS - SONORAN PRONGHORN

After reviewing the current status of the Sonoran pronghorn, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the Sonoran pronghorn. No critical habitat has been designated for this species; therefore, none will be affected. Our conclusion is based on the following:

1. No Sonoran pronghorn in the endangered U.S. population will be affected by the proposed action.

2. Activities on YPG and their effects to Sonoran pronghorn off of Kofa NWR were not analyzed in this biological opinion; however, they were discussed by our offices. Because the Kofa Sonoran pronghorn population is a nonessential experimental population, by definition, it is not essential to the continued existence of the species. We have therefore determined that effects of the proposed action will not jeopardize the continued existence of the species.

3. No Sonoran pronghorn habitat on Kofa NWR will be intentionally impacted as a result of activities occurring on YPG. Fire starting on YPG as a result of munitions firing and spreading onto Kofa NWR could occur but this would be considered a rare event and YPG has adopted more effective communication protocols in responding to fires to prevent their spread.

4. Although we anticipate the proposed action may result in some disturbance to Sonoran pronghorn on Kofa NWR, the number of pronghorn that may potentially be disturbed is relatively small in comparison to the estimated number of Sonoran pronghorn throughout their range. The number of wild Sonoran pronghorn throughout their range is about 681 (the number of wild Sonoran pronghorn in Arizona is about 175). It is difficult to estimate how many Sonoran pronghorn on Kofa NWR may be disturbed by the proposed action, but even if all 36 were disturbed, this would represent 5 percent of the Sonoran pronghorn throughout their range. It is anticipated that the population on Kofa NWR will continue to increase; therefore this percentage is also likely to increase.

5. Measures included in the proposed action will help reduce disturbance to Sonoran pronghorn and their habitat, as well as the risk of injury or death of Sonoran pronghorn on Kofa NWR from project-related activities. These measures include flight limits of 1,500 feet AGL over the King Valley portion of the Kofa NWR, improved communications protocol for fire, and munitions impact areas being located approximately one kilometer away from the boundary of Kofa NWR in the King Valley Area.

6. As explained above, we do not anticipate that downlisting of Sonoran pronghorn will be precluded by the proposed action. No delisting criteria have been established, therefore, it is difficult to analyze the potential impacts of the proposed action on Sonoran pronghorn recovery (delisting). However, as explained above, because YPG activities should have no effect to Sonoran pronghorn within Area A outside of YPG and Kofa NWR and only minimal effects to Sonoran pronghorn on Kofa NWR, it is our opinion that recovery of Sonoran pronghorn will not be precluded by the proposed action.

7. Although populations throughout the species' range continue to be at risk, the proposed project will not have an appreciable impact on the population at the rangewide scale. Thus, the proposed action is not expected, directly or indirectly, to reduce appreciably the likelihood of both survival and recovery of the Sonoran pronghorn in the wild by reducing the reproduction, numbers, or distribution of the species.

8. Recovery is the process that stops the decline of an endangered or threatened species by removing or reducing threats. Recovery ensures the long-term survival of the species in the wild. At that point, the species is recovered, and protection of the ESA is no longer necessary. The aforementioned effects will not appreciably reduce the likelihood of recovery of the Sonoran pronghorn.

The adverse effects that do occur in the action area do not reach the scale where recovery of the species would be significantly delayed or precluded. The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT – SONORAN PRONGHORN

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

Amount or Extent of Take Anticipated – Sonoran pronghorn

We anticipate the proposed action will result in incidental take of a total of four Sonoran pronghorn on Kofa NWR over the life of the project (10-20 years). More specifically, we anticipate the following:

1) Incidental take of two Sonoran pronghorn fawns on Kofa NWR in the form of directly mortality or injury due to fire on the refuge that starts from activities carried out or authorized by YPG, like munitions training and testing. Fire may consume or injure fawns that are too young to flee from oncoming fire; and

2) Incidental take of two Sonoran pronghorn of any age on Kofa NWR in the form of harm due to significant habitat modification or degradation on the refuge from fire that starts from activities carried out or authorized by YPG, like munitions training and testing, that result in death or injury by significantly impairing behavioral patterns, including breeding, feeding, or sheltering.

We anticipate the above anticipated incidental take will be difficult to detect because: 1) dead or impaired individual Sonoran pronghorn are very difficult to find unless they are radio-collared; 2) the status of the species is changing over time through immigration, emigration, and natural loss; and, 3) the species ranges over a relatively large area, and thus the same individual can be difficult to re-detect unless it is radio-collared or ear-tagged. However, monitoring and reporting requirements will allow us to assess the effects of proposed project activities on Sonoran pronghorn. In addition, YPG will report to us any mortality or injury of Sonoran pronghorn due to activities carried out or authorized by YPG.

The amount of anticipated incidental take will have been exceeded, triggering a requirement for reinitiation (50 CFR §402.16) if:

1) More than two fires greater than 10 acres each occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG over the life of the project.

Take of Sonoran pronghorn on YPG that is incidental to, and not the purpose of, carrying out any otherwise lawful activity is authorized under the special rule § 17.84 in the Final 10(j) rule (USFWS 2011), provided that such taking is reported as soon as possible. Otherwise lawful activities are any activities in compliance with applicable land management regulations, hunting regulations, tribal law, and all other applicable law and regulations, and include, but are not limited to, military training and testing, border security and enforcement carried out by Federal law enforcement officials (e.g., U.S. Customs and Border Protection), agriculture, rural and urban development, livestock grazing, camping, hiking, hunting, recreational vehicle use, sightseeing, nature or scientific study, rockhounding, and geocaching, where such activities are permitted.

Effect of the Take

We conclude that this level of anticipated take is not likely to result in jeopardy to the Sonoran pronghorn, for the effects are not expected to appreciably reduce the survival and recovery of the species for the reasons stated in the Conclusions section.

Reasonable and Prudent Measures

The USFWS believes the following Reasonable and Prudent measures are necessary and appropriate to minimize take of Sonoran pronghorn:

1) Monitor environmental conditions on the Kofa Range;

2) Decrease the risk of fire on Kofa NWR from activities carried out or authorized by YPG; and

3) Report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, YPG must comply with the following Terms and Conditions, which implement the Reasonable and Prudent Measures described above and outline required reporting and monitoring requirements. These Terms and Conditions are non-discretionary.

1) The following Term and Condition implements Reasonable and Prudent Measure Number 1:

    a. YPG shall monitor environmental conditions on the Kofa Range, including weather patterns (e.g., temperature, precipitation, humidity) and status of fuels (e.g., distribution and density of annual vegetation or any other vegetation that is capable of carrying fire across the landscape).

2) The following Term and Condition implements Reasonable and Prudent Measure Number 2:

    a. YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire department with wildland firefighting capabilities. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire station on the Kofa Firing Range (KFR) to provide rapid response on the Kofa Range in the event of fire. If the fire department and/or fire station are discontinued at any time in the future, YPG shall notify FWS-AESO and Kofa NWR, and this Term and Condition may need to be reevaluated.

    b. Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by 1) providing additional fire briefings to test officers to stress the importance of initial fire spotting and early notification, and 2) subject to availability of funds, maintain fire break infrastructure where such infrastructure is compatible with the military mission (as determined by the Senior Commander) and pronghorn conservation (as determined through coordination with Kofa NWR and FWS-AESO) and is anticipated to reduce the risk of fire spreading to Kofa NWR (as determined by local firefighting agencies).

3) The following Term and Condition implements Reasonable and Prudent Measure Number 3:

    a. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to FWS-AESO and Kofa NWR as soon as possible. The report (can be in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as number of pronghorn in the

vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has or may encroach onto the refuge.

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

Disposition of Dead or Injured Listed Species

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the USFWS's Division of Law Enforcement, 2450 West Broadway, Mesa, Arizona (480-967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition.

In accordance with the Final 10(j) rule (USFWS 2011), any incidental take of Sonoran pronghorn must be reported as soon as possible by calling the USFWS, Arizona Ecological Services Office, 201 N Bonita Avenue, Suite 141, Tucson, AZ 85745 (520/670–6150), or the Cabeza Prieta National Wildlife Refuge, 1611 North Second Avenue, Ajo, AZ 85321 (520/387–6483). Upon contact, a determination will be made as to the disposition of any live or dead specimens.

In addition to the above, the 2014 Final Incident Response Protocol for Sonoran pronghorn will be followed.

CONSERVATION RECOMMENDATIONS – SONORAN PRONGHORN

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

1. Continue to participate on the Sonoran Pronghorn Recovery Team as staffing and funding permit.

2. Participate in the implementation of the Sonoran Pronghorn Recovery Plan, including providing or pursuing financial support, subject to the availability of funds, to implement recovery actions on YPG that are identified by the Sonoran Pronghorn Recovery Team as military mission allows.

3. Avoid and minimize adverse effects to Sonoran pronghorn from military and other activities on YPG to the extent practicable.

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

REINITIATION NOTICE

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

Thank you for your cooperation and assistance throughout this consultation process. Any questions or comments should be directed to Erin Fernandez (520) 670-6150 (x238) or Jean Calhoun (x223). Please refer to the consultation number, 02EAAZ00-2014-F-0161 in future correspondence concerning this project.

Sincerely,

/ s / Scott Richardson for
Steven L. Spangle
Field Supervisor

cc (hard copy):
Field Supervisor, Fish and Wildlife Service, Tucson, AZ (2 copies)
Jean Calhoun, Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

cc (electronic copy):
Greg Risdahl, Refuge Manager, Kofa National Wildlife Refuge, Ajo, AZ
James Atkinson, Cabeza Prieta National Wildlife Refuge, Ajo, AZ
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Raul Vega, Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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TABLES AND FIGURES

Table 1. A summary of population estimates from literature and field surveys for Sonoran pronghorn in the U.S.

Date	Population estimate (95 percent CI[a])	Source
1925	105	Nelson 1925
1941[b]	60	Nicol 1941
1957	<1,000	Halloran 1957
1968	50	Monson 1968
1968-1974	50 - 150	Carr 1974
1981	100 - 150	Arizona Game and Fish Department 1981
1984	85 - 100	Arizona Game and Fish Department 1986
1992	179 (145-234)	Bright et al. 1999
1994	282 (205-489)	Bright et al. 1999
1996	130 (114-154)	Bright et al. 1999
1998	142 (125-167)	Bright et al. 1999
2000	99 (69-392)	Bright et al. 2001
2002	21 (18-33)	Bright and Hervert 2003
2004	58 (40-175)	Bright and Hervert 2005
2006	68 (52-116)	Unpublished data
2008	68 [c]	Unpublished data
2010	85	Unpublished data
2012	159	Unpublished data

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

Table 2. Comparison of endangered Sonoran pronghorn population surveys in the U.S., 1992-2012.

	Pronghorn observed		Population estimates			
Date	On transect	Total observed	Density estimate using DISTANCE (95 percent CI[a])	Lincoln-Peterson (95 percent CI)	Sightability model (95 percent CI)	Other estimate
Dec 92	99	121	246 (103-584)	---	179 (145-234)	
Mar 94	100	109	184 (100-334)	---	282 (205-489)	
Dec 96	71	82 (95[b])	216 (82-579)	162 (4-324)	130 (114-154)	
Dec 98	74	86 (98[b])	---	172 (23-321)	142 (125-167)	
Dec 00	67	69[b]	N/A	N/A	99 (69-392)	
Dec 02	18	18	N/A	N/A	21 (18-33)[c]	
Dec 04	39	51	N/A	N/A	58	
Dec 06	51	59	N/A	N/A	68 (52-116)	
Dec 08	N/A	N/A	N/A	N/A	N/A	68 [d]
Dec 10	N/A	N/A	N/A	N/A	N/A	85
Dec 12	N/A	N/A	N/A	N/A	N/A	159

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

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

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

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

Table 3. Comparison of Sonoran pronghorn population surveys in Mexico, 2000-2009.

Date	Pronghorn observed			Population estimate		
	West of Highway 8 (Mexico)	Southeast of Highway 8 (Mexico)	Total	West of Highway 8 (Mexico)	Southeast of Highway 8 (Mexico)	Total
Dec 2000						346
Dec 2002			214			280
Dec 2004 Feb 2005	30	439	469	59	625	684
Jan 2006			486			634
Dec 2007	35	325	360	50	354	404
Dec 2009	53	258	311	101	381	482
Dec 2011	30	167	197	52	189	241
Dec 2013	--	372	372	--	434	434

Figure 1. Map of YPG ranges and Kofa NWR, southwestern Arizona (from the BE).

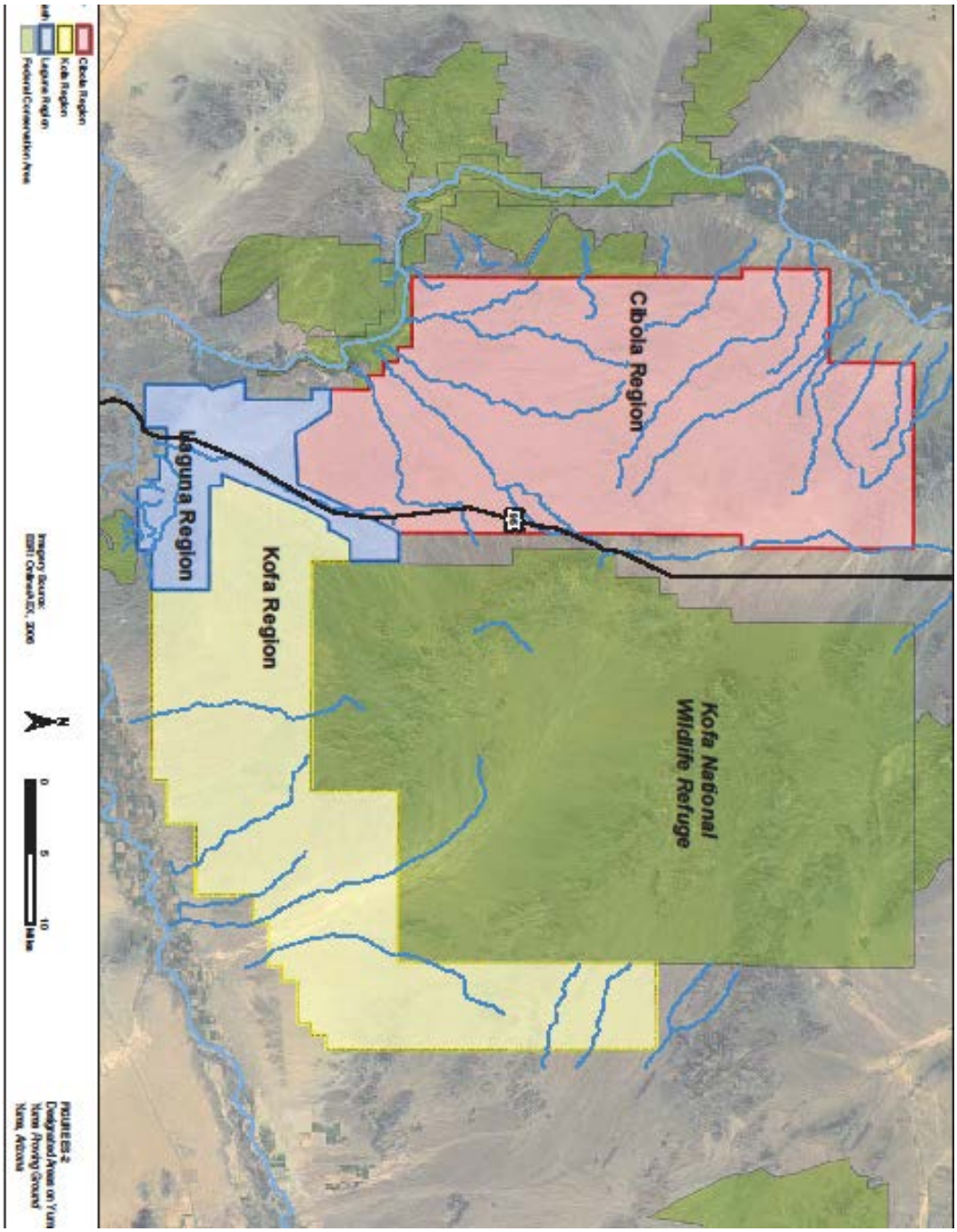


Figure 2a. Map of the Proposed Action in the Kofa Region of YPG (note the boundary of the impact area was reduced from what was shown in the draft EIS) (from BE).

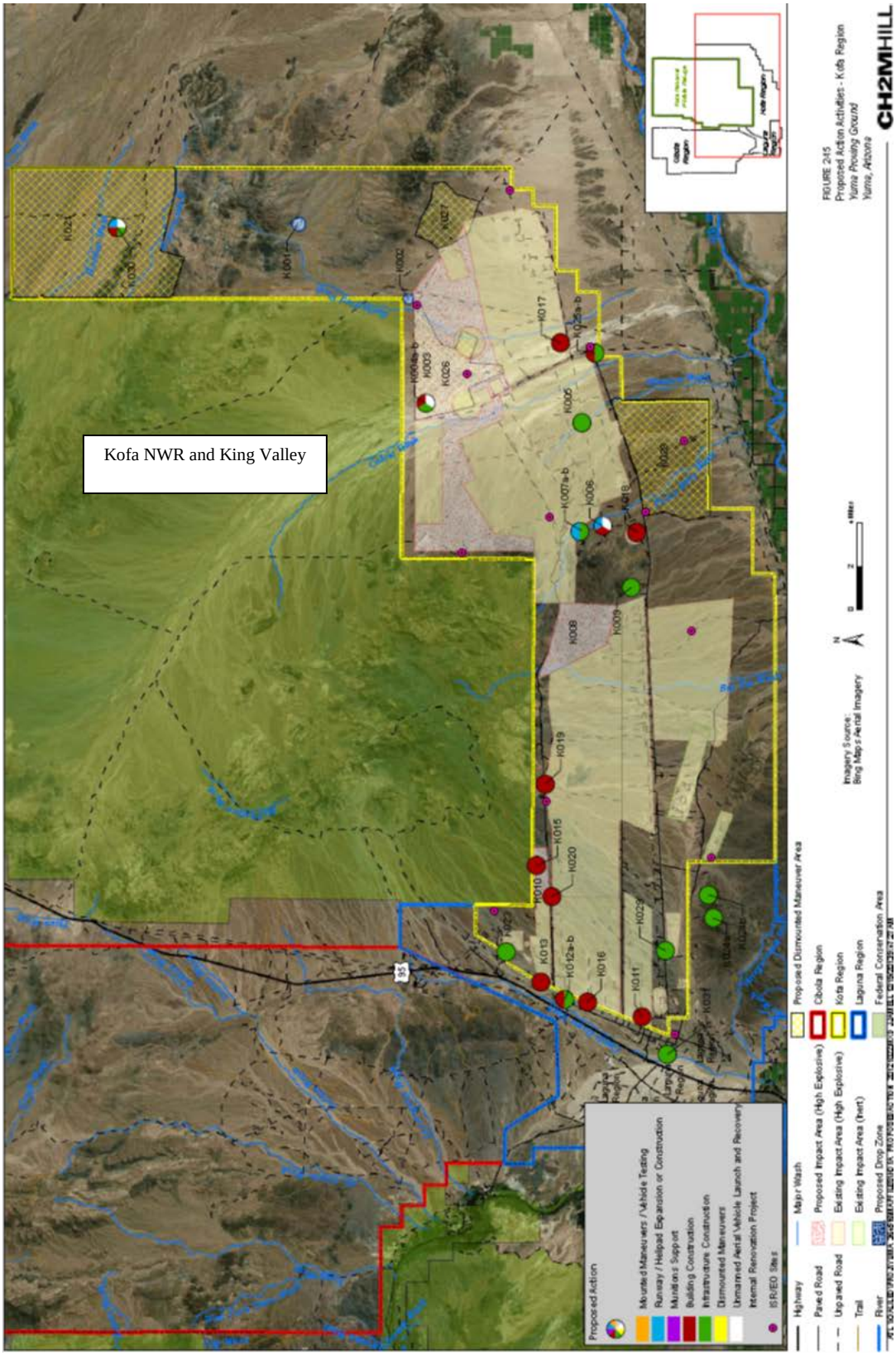


Figure 2b. Enlarged view of the Proposed Action in the Kofa Region of YPG near the Kofa NWR boundary.

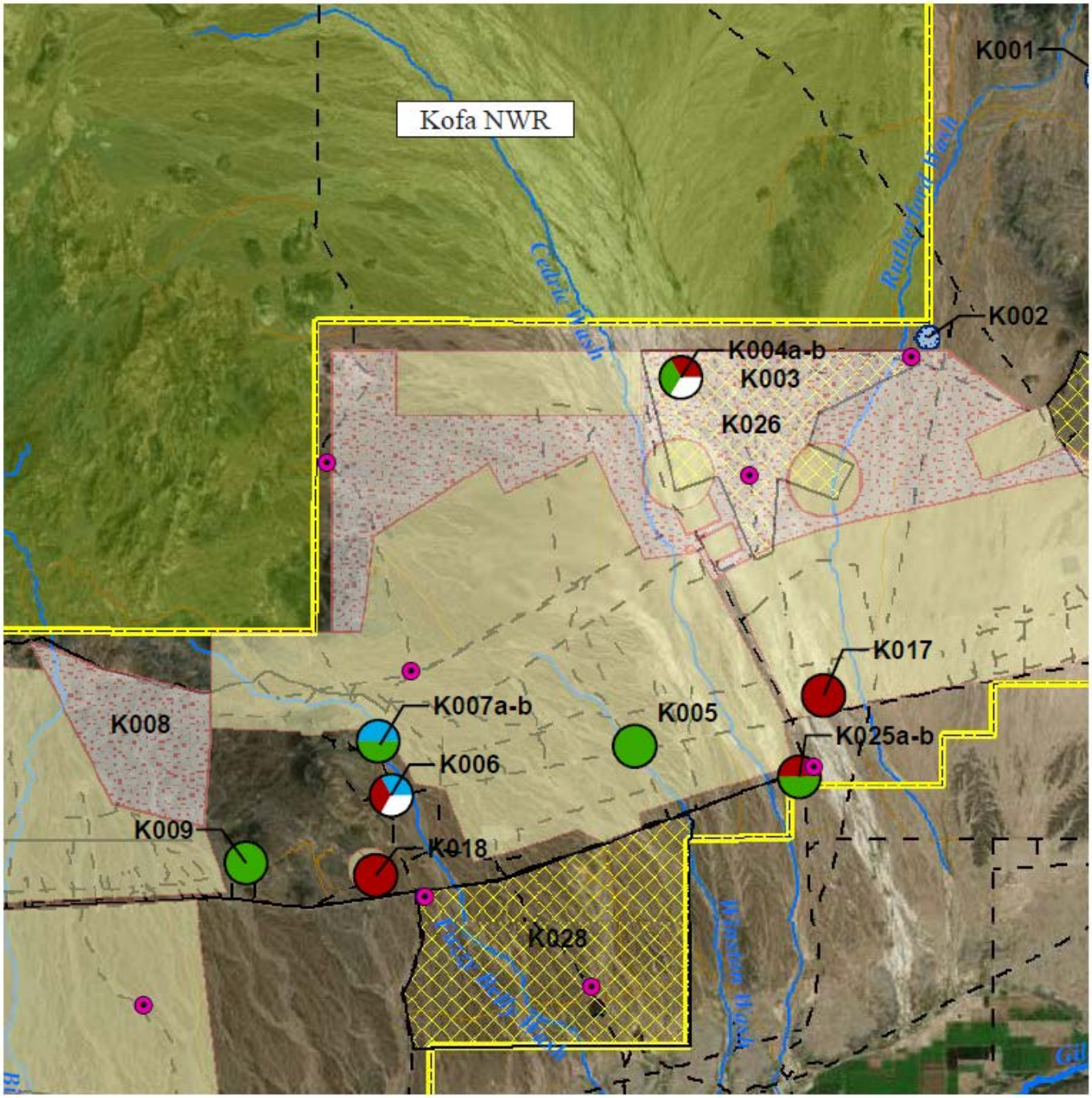
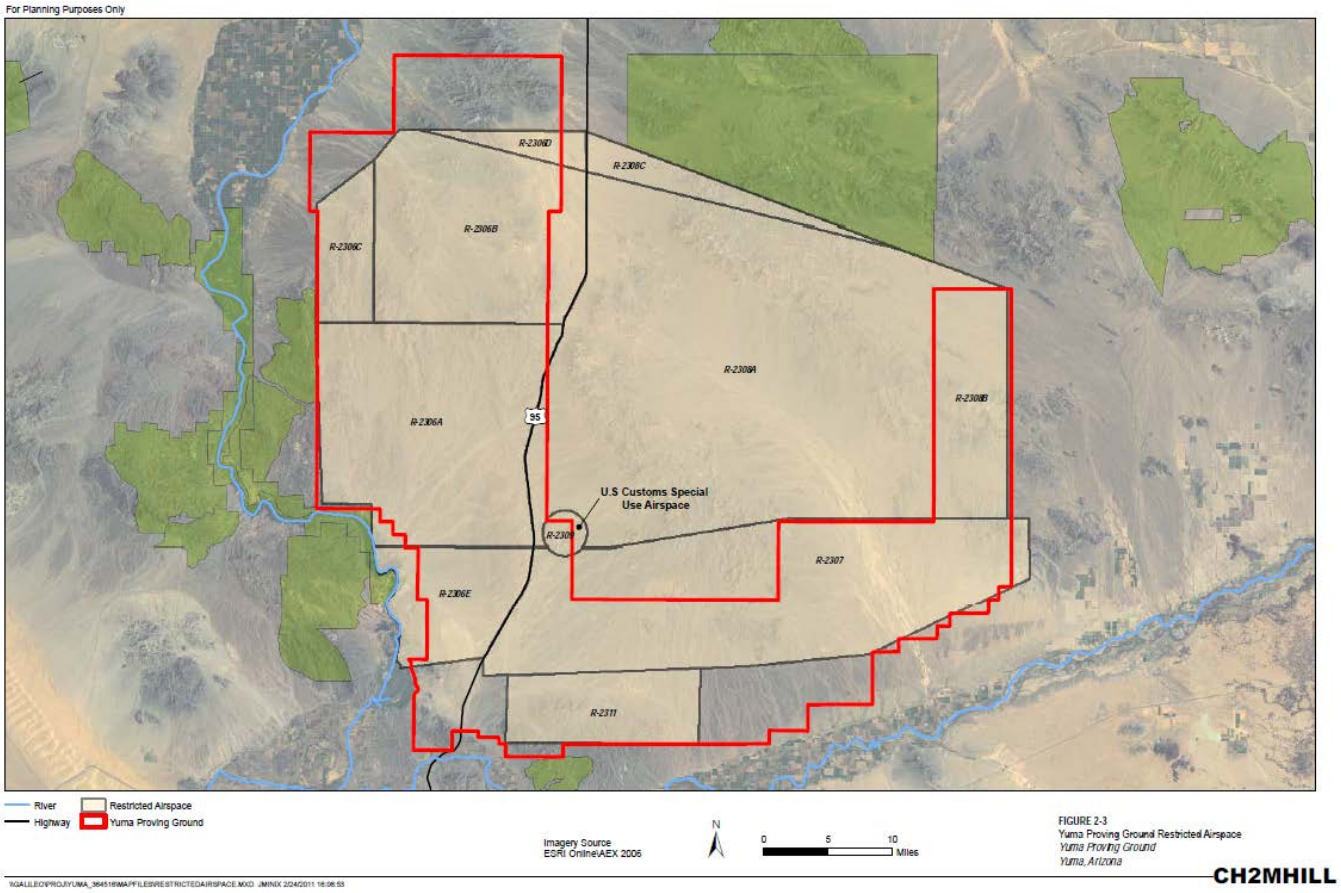


Figure 3. YPG Airspace.



Description of Airspace

R-2306A	Covers the southern part of the Cibola Region from the surface to 80,000 ft
R-2306B	North of R-2306A in the Cibola Region, from the surface to 80,000 ft
R-2306C	West of R-3206B in the Cibola Region, from the surface to 40,000 ft
R-2306D	North of R-2306B in the Cibola Region, from the surface to 23,000 ft
R-2306E	South of R-2306A in the Cibola and Laguna Regions, from the surface to 80,000 ft
R-2307	Laguna and Kofa Regions east of US 95 and north of Pole Line Road, from the surface to unlimited. Also includes the southern portion of the Kofa NWR
R-2308A	Kofa NWR from 1,500 ft above ground level (AGL) to 80,000 ft
R-2308B	East of R-2308A in East Arm, from the surface to 80,000 ft
R2308C	North of R-2308A in Kofa NWR from 1,500 ft AGL to 23,000 ft
R-2309	Department of Justice Special Use Airspace. 1.5-mile radius from the surface to 15,000 ft,north of CDH
R-2311	Eastern Kofa Region south of Pole Line Road from the surface to 3,500 ft
R-2306F	Proposed at Laguna Airfield from the surface to 1,700 ft

Figure 4. Large Caliber Noise Contour from the YPG Operational Noise Management Plan.

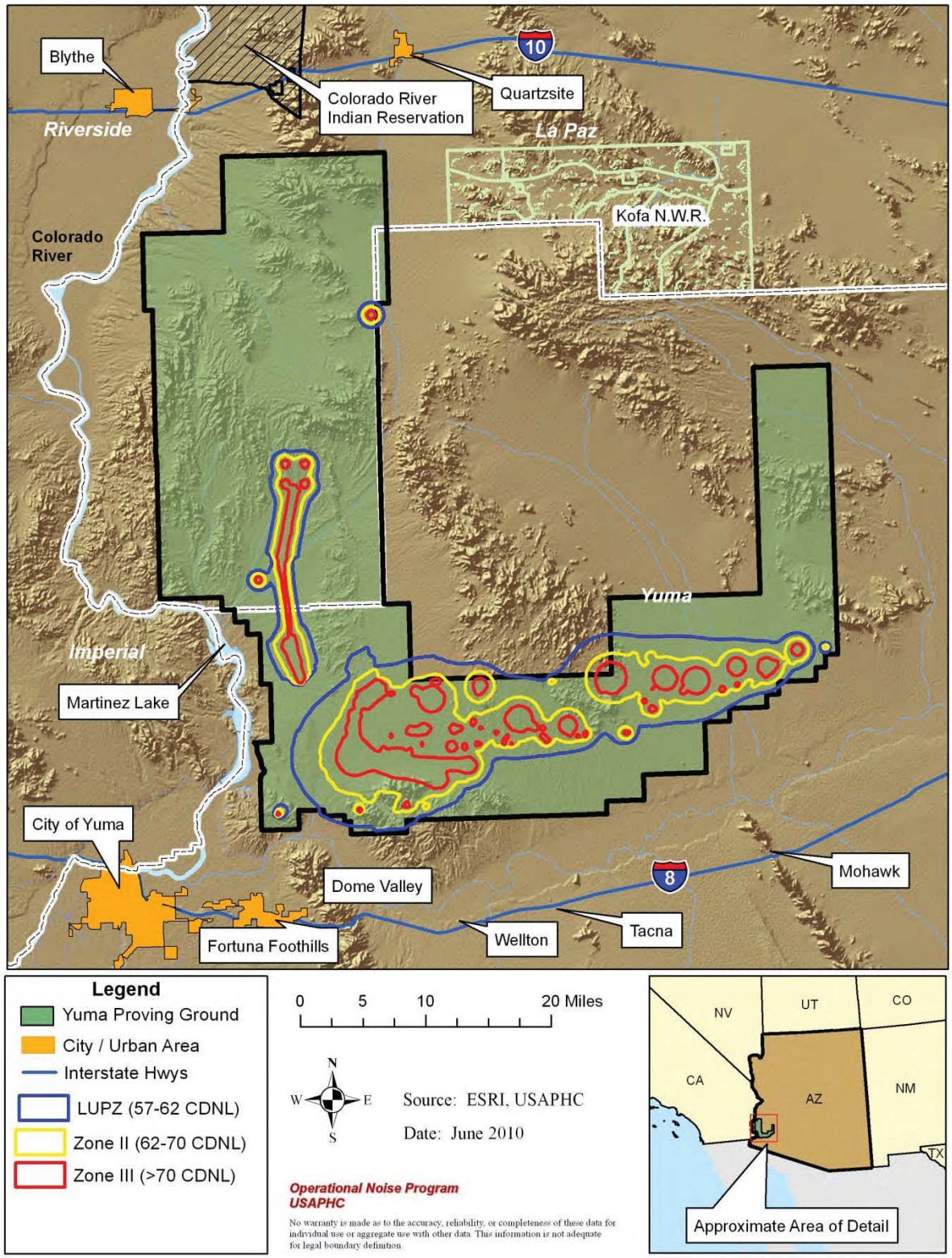


Figure 5. Historical range of Sonoran pronghorn in the Unites States and Mexico.

Figure 6. Endangered Sonoran pronghorn range in southwestern Arizona, United States.

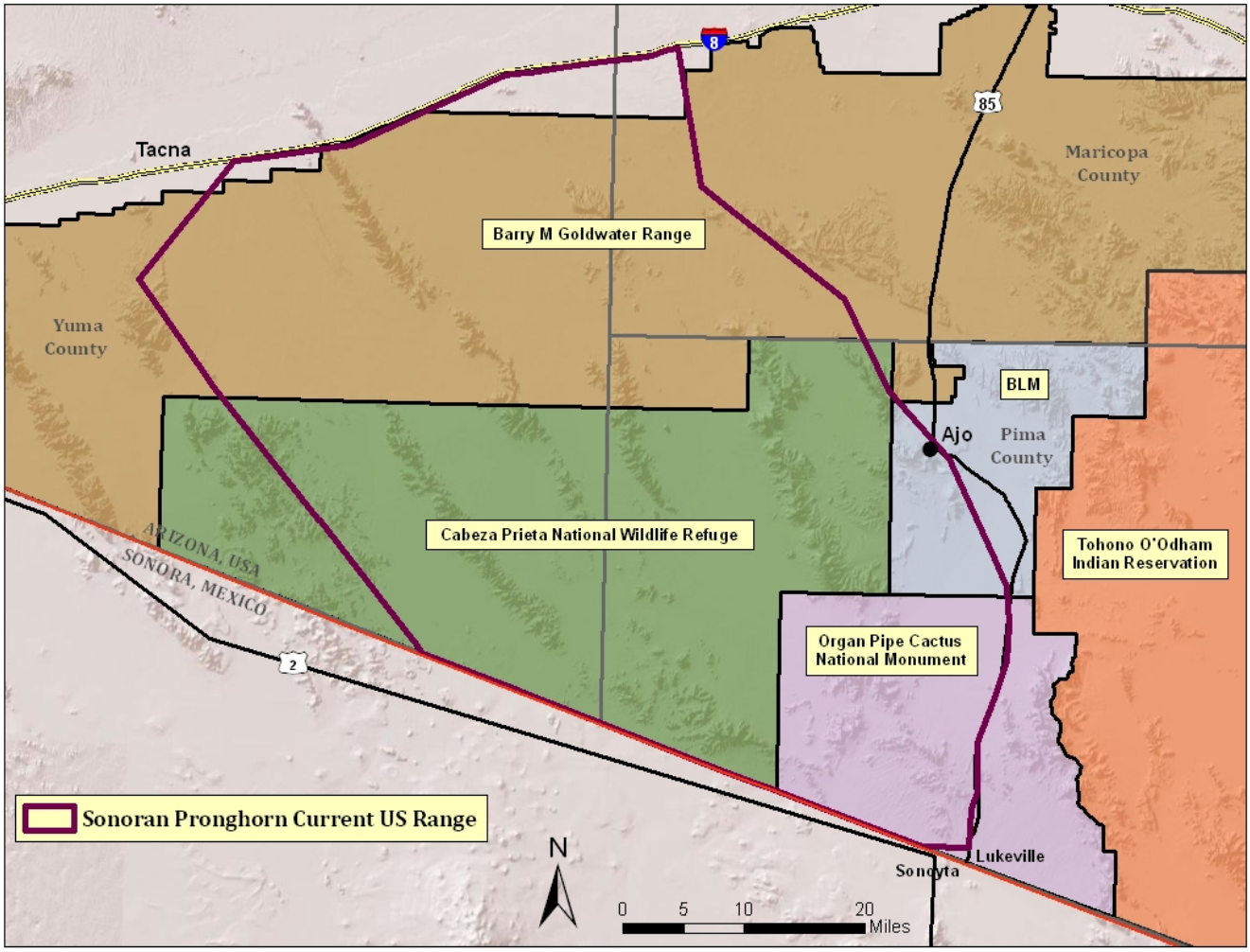


Figure 7. 10(j) Nonessential Experimental Population area for Sonoran pronghorn in southwestern Arizona, United States.

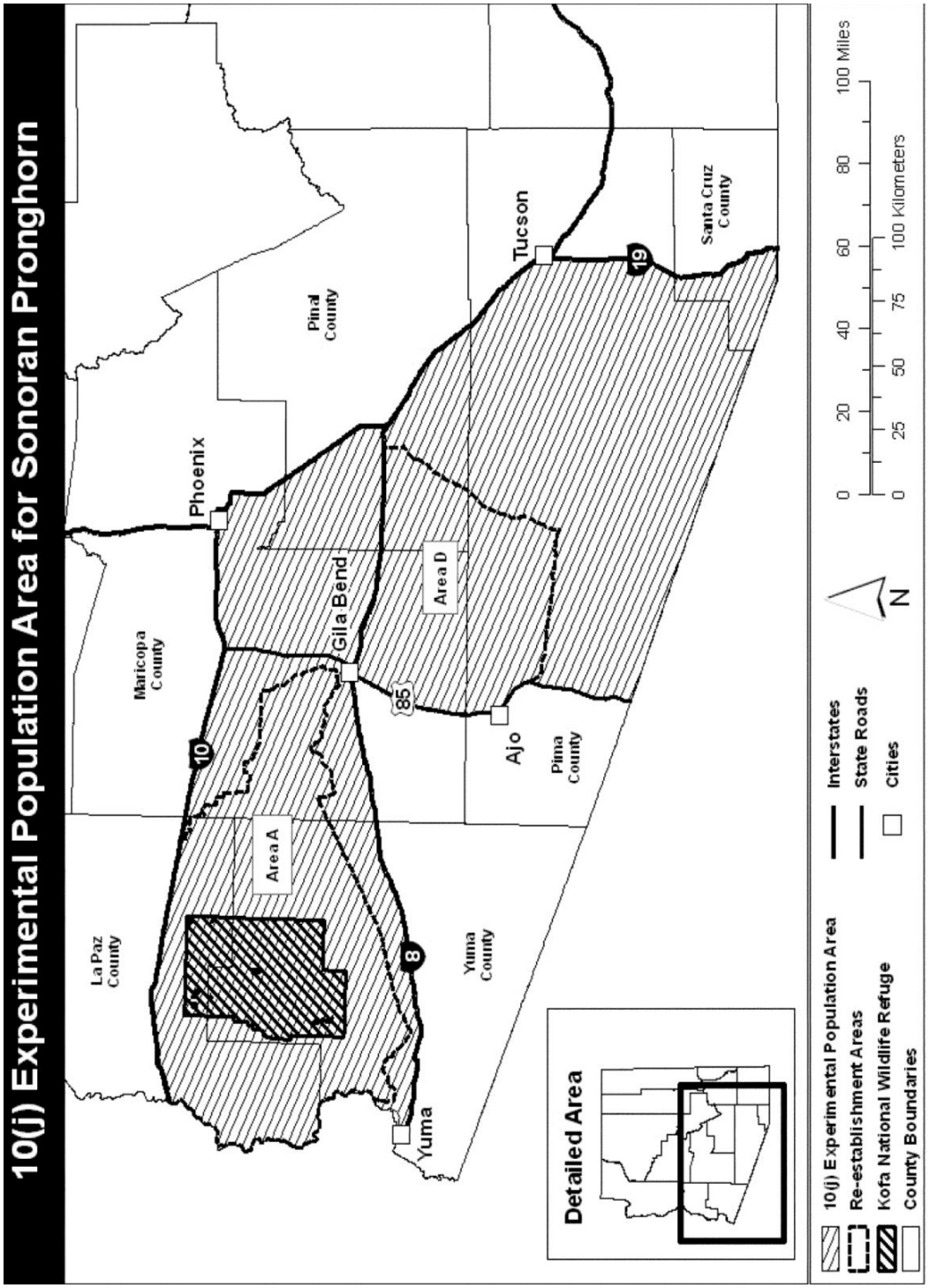
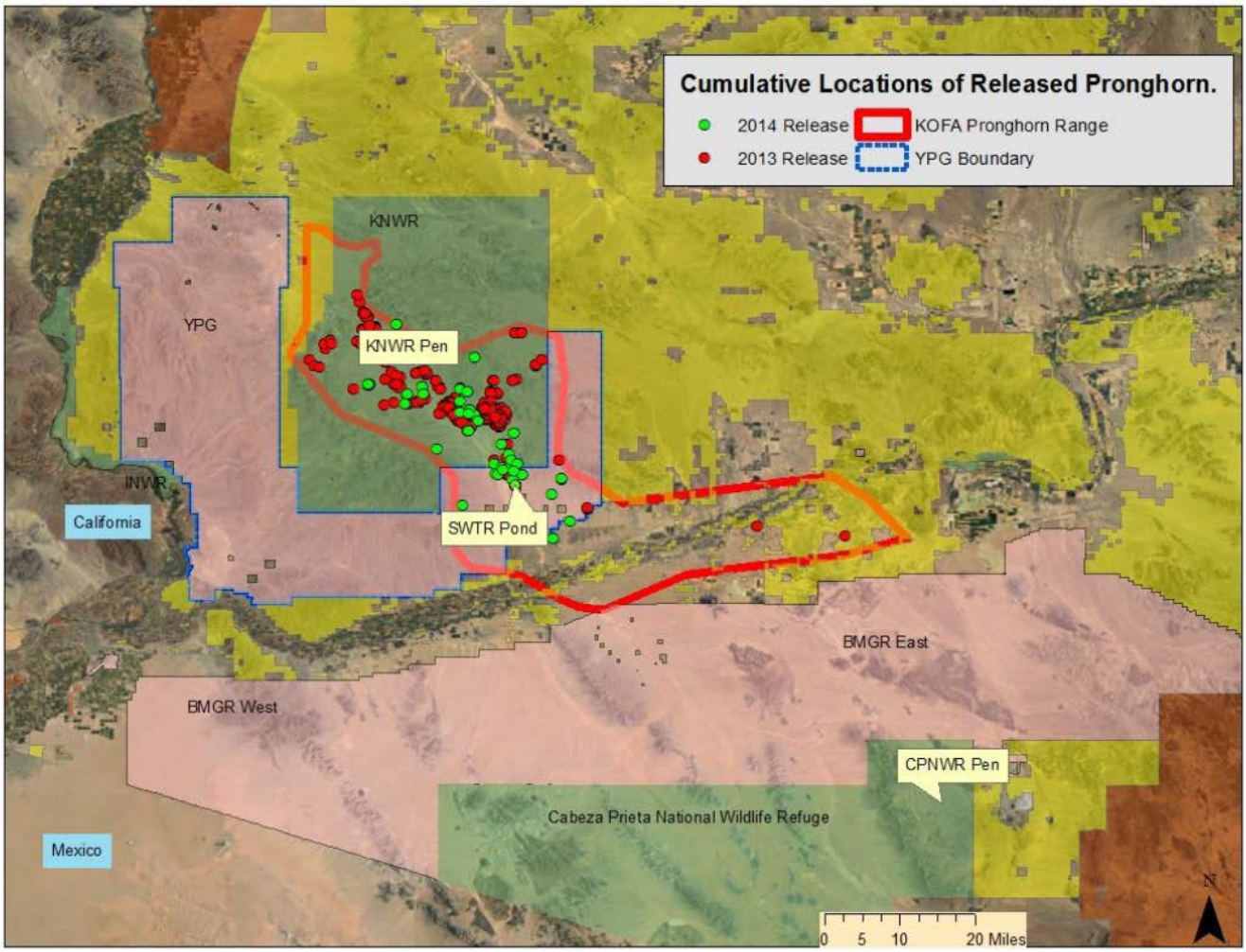



Figure 8. Sonoran pronghorn locations on YPG, Kofa NWR, and surrounding areas (note: the extent of the pronghorn range is based on telemetry data and is likely to change as pronghorn continue to disburse and new data is collected). Map is from the YPG BE (Figure 5).