APPENDIX A

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Alternate OSD Federal Register Lisison Officer, Department of Defense.

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DEPARTMENT OF DEFENSE

Department of the Air Force

Notice of Intent to Prepare an Environmental Impact Statement (EIS) for the Barry M. Goldwater Range Integrated Natural Resources Management Plan

AGENCY: Department of the Air Force, DoD.

SUMMARY: Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), as implemented by the Council on Environmental Quality regulations (40 CFR 1500 to 1508), the Departments of the Air Force and Navy, in partnership with the Department of the Interior and the State of Arizona (Arizona Game and Fish Department), intend to prepare an EIS to evaluate the environmental effects of the implementation of the Integrated Natural Resources Management Plan being prepared for the Barry M. Goldwater Range.

DATES: Comments must be received no later than August 28, 2000 to ensure full consideration in the EIS.

ADDRESSES: See **SUPPLEMENTARY INFORMATION** section for meeting addresses.

FOR FURTHER INFORMATION CONTACT: Luke Air Force Base, 56 FW/RMO, 6605 North 140th Drive, Luke AFB, AZ 85309–1934 (Attn: Mr. Bob Barry, telephone 623–856–3823, extension 242); Marine Corps Air Station Yuma at Range Management Department, Box 99160, Yuma, AZ 85369–9160 (Attn: Mr. Ron Pearce, telephone 520–341–3401); Bureau of Land Management at Phoenix Field Office, 2015 West Deer Valley Road, Phoenix, AZ 85027 (Attn: Mr. Gene Dahlem, telephone 623–580–5525); or Arizona Game and Fish Department, 2221 W. Greenway Road WM–HB, Phoenix, AZ 85023–4312 (Attn: Mr. John Kennedy, telephone 602–789–3602).

SUPPLEMENTARY INFORMATION: The Barry M. Goldwater Range, located in southwestern Arizona, was rewithdrawn from the public domain for military training purposes under the Military Lands Withdrawal Act of 1999 (Public Law 106–65). In compliance with this Act, the Air Force and Marine Corps, in partnership with the Department of the Interior and the State of Arizona (Arizona Game and Fish Department), will manage the natural resources present on the Range in accordance with the Sikes Act (16 U.S.C. 670).

Accordingly, the Air Force and Marine Corps, in partnership with the Department of Interior and the State of Arizona (Arizona Game and Fish Department), are preparing and will implement an Integrated Natural Resources Management Plan for the Goldwater Range. Pursuant to the requirements of Public Law 106–65 and the Sikes Act, this Plan will provide for: (1) Management of natural and cultural resources present on the Range in support of the requirements of the military mission, (2) sustainable public use to the extent that use is compatible with military activities and natural and cultural resource compliance requirements, (3) compliance with laws protecting sensitive biological and cultural resources, including endangered species management, and (4) participation in local initiatives to advance regional biodiversity goals. The EIS, which is being prepared concurrently with the Integrated Natural Resources Management Plan, will evaluate the environmental effects of the management alternatives proposed in the Plan. Given the military purposes of the Range and the safety and security requirements associated with those purposes, the alternatives to be studied will focus on the protection, conservation, and management of resources and public use opportunities to the extent possible while not jeopardizing the military purposes of the Range.

Environmental issues to be addressed in the EIS include but are not limited to earth, biological, cultural, water, and visual resources; regional biological diversity management; wildlife management; threatened and endangered species; air quality; noise; land use compatibility; socioeconomics; recreation; environmental justice; and public health and safety.

The Air Force and Marine Corps, in partnership with the Department of the Interior and the State of Arizona (Arizona Game and Fish Department), are initiating a scoping process to determine the extent of issues to be addressed and identify the significant issues related to this action. Scoping meetings will be held in six southern Arizona communities, as indicated in the Meetings section below. Each meeting will begin with an open house at which the public may review maps and other displays. At each meeting location, the open house will be followed by a formal presentation beginning at 7:00 p.m. These meetings also will be advertised in area newspapers. A Tohono O'odham translator will be available at the meeting in Sells, AZ.

Air Force, Marine Corps, Department of the Interior, and State of Arizona representatives will be available at these meetings to receive comments from the public regarding issues of concern to the public. Federal, state and local agencies, any affected Native American tribes, and interested individuals are encouraged to take this opportunity to identify environmental concerns that should be addressed during the preparation of the EIS. Agencies and the public are also invited and encouraged to provide written comment on issues that are important to them in addition to, or in lieu of, oral comments at the public meeting. To be most helpful, comments should clearly describe specific issues or topics, which the commentor believes the EIS should address. Written statements and or questions regarding the Integrated Natural Resources Management Plan and associated EIS should be mailed to BMGR INRMP, P.O. Box 67132, Phoenix, AZ 85082–7132.

Meetings

Public scoping meetings will be held:

1. Monday, August 7, 2000, 5:30 to 8:30 p.m., Glendale Adult Center Palo Verde Building, 7121 North 57th Avenue, Glendale, AZ.

2. Tuesday, August 8, 2000, 5:30 to 8:30 p.m., Ajo Community Center, 290 East 5th Street, Ajo, AZ.

3. Wednesday, August 9, 2000, 5:30 to 8:30 p.m., El Rio Center, 1390 West Speedway Boulevard, Tucson, AZ.

4. Thursday, August 10, 2000, 5:30 to 8:30 p.m., Kofa High School, 3100 Avenue A, Yuma, AZ.

5. Friday, August 11, 2000, 5:30 to 8:30 p.m., Gila Bend Union High School, 308 North Martin, Gila Bend, AZ.

6. Tuesday, August 15, 2000, 5:30 to 8:30 p.m., Tribal Council Chambers, Sells, AZ.

Janet A. Long,

Air Force Federal Register Liaison Officer.

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APPENDIX B

CURRENT EXPLOSIVE ORDNANCE DISPOSAL (EOD) PRACTICES WITHIN THE BMGR

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CURRENT EXPLOSIVE ORDNANCE DISPOSAL (EOD) PRACTICES WITHIN THE BMGR

The Defense Department mandates that a programmatic strategy be used to maintain bombing and gunnery ranges in the best interests of safety and the environment commensurate with the use of the land as a weapons range. The source of these mandates may be found in P.L. 106-65, Section 3031(c), DoD Directive 4715.11. Within BMGR—East, Air Force clearance standards established in AFI 13-212, Volume 1 drive the Air Force EOD clearance operation. Marine Corps EOD clearance practices applied within BMGR—West are controlled by policies established by MCAS Yuma.

EOD activity is an important facet of the service's strategies to keep the range safe for continued operation and well maintained by managing ground hazards resulting from military training activity. Within BMGR—East, EOD range clearances are performed by the 56th CES EOD Flight under direction of the 56th RMO. Within BMGR—West, EOD personnel from the Range Management Department at MCAS Yuma clear munitions[B-1] from the Marine's operating areas. Basic EOD functions are common to both services, namely that they locate, identify, and subsequently destroy dangerous unexploded ordnance remaining from training operations of their respective services.

The ongoing EOD program on the BMGR has five objectives:

1. Remove unexploded ordnance (UXO) from the ground surface of the EOD clearance zones of in-service target impact areas

2. Remove built up scrap metal contamination from the cleared zones

3. Secure expended munitions, spent targets, and munitions scrap until it may be safely processed and recycled

4. Demilitarize and decontaminate all munitions and target scrap to make it safe for recycling in commercial metal processing plants

5. Recycle all metals removed from the range safely and ensure that trash sent to landfills is free of hazardous material

Aircrew training requires the use of aircraft to deliver a wide variety of military munitions against ground or aerial targets. These munitions include many types of bombs, rockets, missiles, cannon, or machine gun ammunition, and a variety of flares intended for specialized tasks ranging from target illumination to diversion of enemy heat-seeking missiles away from friendly aircraft. In addition, ground forces incorporated into large-force aviation training exercises, such as the Marine Corps WTI Course, may employ artillery or mortar ammunition, small arms, and crew-served machine guns.

[B-1] The terms ordnance and munitions are synonymous and are used interchangeably

Among the variants of these weapons that may be used for warfighting are those that destroy targets (through conventional high-yield explosives (also called high explosives or HE), incendiaries, or kinetic energy), provide illumination, or smoke. The weapons ranges on the BMGR are designed to support aircrew training in the use of most types of aircraft-delivered munitions, although most of this training is effectively accomplished through the use of training practice munitions rather than live warfighting ordnance. More than 99 percent of the munitions currently used in training activity within BMGR—East are training munitions, sometimes referred to as “target practice” or "training practice" variants. All of the munitions utilized in regularly scheduled training activities within BMGR—West are training practice munitions.

Training practice munitions are designed to replicate the delivery trajectories of their warfighting counterparts, but they do not contain live HE warheads. Aircraft cannon ammunition fired against range targets is restricted to target practice ammunition only. No explosive aircraft cannon rounds or the armor piercing warfighting rounds used by the A-10 aircraft 30 mm cannon, which use depleted uranium penetrators, are permitted anywhere on the BMGR. Training practice munitions may be the same size and weight as their live warfighting counterparts or they may be a sub-scale/caliber version designed to simulate the delivery trajectory of the live round without the mass normally associated with a full-scale weapon. Training munitions may be completely inert or may contain limited quantities of explosives or pyrotechnics, known as a signal cartridge or spotting charge, that are used to mark their impact point for scoring purposes. Any munition—live or target practice—that EOD personnel encounter that retains or potentially retains explosives is managed as UXO regardless of its explosive charge weight. UXO is defined as:

> … military munitions that have been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard or potential hazard, to operations, installation, personnel, or material, and remain unexploded either by malfunction, design, or other cause (DoD Directive 4715.11, 1999).

Live air-to-ground munitions may be used on the BMGR, but currently only within BMGR—East and only on the three designated HE Hill or two live Maverick missile targets within North, South, and East TAC ranges. Air-to-ground ordnance deliveries on all other targets within both BMGR—East and BMGR—West are restricted to training practice munitions.

The ground impact effects of training and live munitions can be sharply different. While these smaller spotting charges are capable of causing severe injury or death to the personnel handling them, they do not cause significant environmental damage through blast, fire, or fragmentation. The principal damaging effect of training practice ordnance is physical disturbance of the ground surface or to vegetation from the effect of high velocity impact. Depending on the angle of impact and the composition of the ground surface—rock or soil—the inert mass of a 500-pound training practice bomb may create a surface crater roughly the size and shape of the bomb in cross section and 18 inches or more in depth. Live weapons that explode after contact with the Earth’s surface or that malfunction and are subsequently detonated in place by EOD personnel have a much more dramatic impact on the local area from their explosive effects than do training practice ordnance. An impact crater from a live bomb can be as much as 8 to 10 feet in depth and 20 to 30 feet in diameter depending on the depth of penetration before detonation and the composition of the ground surface. Owing to the accuracy of the air-to-ground weapons delivery systems on board modern military aircraft, live and training ordnance impact areas on the BMGR

are tightly concentrated around the developed targets. In soft soils and at high angles of incidence, training practice munitions or live munitions that failed to detonate on delivery may be partially or completely buried by their impact momentum.

Although more benign from an immediate danger standpoint than munitions containing live high-explosives, training ordnance on the ground surface must be found, assessed, and recovered by EOD work crews using heavy equipment and off-highway vehicles to keep the targets safe for continued use while maintaining the tactical integrity of the target. EOD personnel normally destroy unexploded live weapons by countercharging them in place (commonly known as a "blow-in-place" procedure in EOD vernacular). Heavy equipment is required to support training ordnance recovery operations because of the large size and volume of munitions that must be removed each year. Recovery operations can cause considerable localized damage to the soils and plant communities within established clearance zones. One of the critical benefits of EOD clearance work is that a relatively small area of range land can be maintained to support safe operational training use on an ongoing basis. The EOD clearances limit the amount of range land that must be committed to use as target impact areas.

AFI 13-212 VI specifies that the surfaces of Air Force manned range targets are to be cleared of collectable munitions and munitions scrap to a radius of 500 feet once every 50-use days (bimonthly) and to a radius of 1,000 feet once annually. These same targets must also be cleared to a radius of one kilometer (3,281 feet), or until the density of munitions is reduced to less than five items per acre, whichever is the lesser distance, at least once every five years. Tactical range targets must be cleared annually to a distance of 1,000 feet from the target and to a distance of one kilometer until the density of munitions is reduced to less than five items per acre, which ever is the lesser distance, at least once every five years.

Standard EOD clearances, as practiced within BMGR—East, require off-road travel by several heavy vehicles (typically 5-ton M929 or similar dump trucks) that are used to drive parallel search lines across the clearance area in a line abreast formation to find and then haul inert munitions to consolidation points. Each truck carries a driver and a crewman who watch for munitions on their respective sides of the vehicle. When a clearance vehicle crew encounters munitions, the entire line stops. The munitions are inspected and evaluated for action. If the munitions are dangerous and require disposal in place, the crew records their position with a GPS unit and physically marks them with a temporary flag. If the munition has hazardous components, but can be safely handled (i.e. a practice bomb with a live spotting charge or a live flare) the team loads it into a truck designated to haul hazardous material to an on-range disposal site. If the munition is hazard-free it is simply loaded in the nearest truck for transport to the RMCP as scrap. Not all inert munitions are man-portable. Large inert bombs are chained to the clearance truck hitch and pulled along to a central point where explosive bomb case-opening procedures will be performed to prepare the bombs for salvage. After the bomb cases are explosively opened to confirm that each munition has an inert concrete core rather than a HE filler or a spotting charge, heavy lift equipment is used to load the scrap on trucks for transport to one of the four RMCPs within BMGR—East.

The parallel search lines are spaced appropriately in response to the density of the munitions and vegetative cover present. The vegetative cover is sparse enough in most of the five-year clearance areas that the search lines can be spaced by 150 to 250 feet without sacrificing the visibility needed to effectively locate munitions. This spacing is an average range, as the vehicles must maneuver to recover heavy munitions, avoid dense (e.g. mesquite bosques) or significant

vegetation (e.g., saguaro or other large cactus and trees), and pick a safe path through terrain. Spacing of 50 feet or less between vehicles is typically required for the annual-clearance area of a well-used target because of the higher density of expended munitions.

EOD teams also have a role within BMGR—East in the removal and disposal of spent target material. At the start of each clearance, maintenance personnel determine which targets must be replaced during the clearance. EOD personnel perform an initial evaluation of each replaced target to ascertain that it is free of imbedded unexploded ordnance. Safe targets are loaded and transported to the RMCPs. Targets with UXO hazards are held on the range until blow-in-place procedures to destroy the dangerous munitions are completed.

Munitions and target scrap and other debris removed from BMGR—East weapons ranges undergo demilitarization processing, also known as range residue removal (R3) processing, at the RMCPs to prepare this material for recycling or disposal. With the exception of crushing and flashing procedures used to demilitarize some types of training practice ordnance, all R3 processes share four common steps. The first step is a radiological survey that ensures no Low Level Radiological Waste (LLRW) is being processed for recycling. Second, the prime contractor's UXO specialist completes an inspection of the munitions and targets. Third, a third party UXO specialist confirms that the munitions and targets are safe to process. The metals are then cut up or crushed. Fourth, the recoverable metal gleaned from the R3 process is sealed in a transport container, certified free of explosives and LLRW, and trucked directly to a processing mill without passing through an intermediate level scrap yard. Even trash harvested from the weapons ranges must be inspected and certified explosive-free before it is hauled to local landfills. The R3 services provide clean, safe, metal products that are ready to recycle and re-use for industrial applications.

Large inert training bombs and salvaged trucks and light vehicles formerly used as targets are cut apart by a specially built hydraulic powered shear that is mounted on a tracked excavator. LLRW, found occasionally in the irradiated instruments of old military vehicles and some aircraft, is removed and set aside for disposal by the government according to rules established by the Nuclear Regulatory Commission. Concrete filler material from the large processed training bombs is left on site and used as a soil stabilizer within the confines of the RMCPs. Some bombs are equipped with parachutes that are used to retard their velocity and control their trajectory for some types of low-level bomb deliveries. These parachutes are cut away from large bomb fins and are processed as non-recyclable, and otherwise worthless trash that ultimately ends up in a landfill. All vehicle residues are either recycled or, if unacceptable for this process, culled and sent to an appropriate landfill. Tires are sorted by size and taken to the Maricopa County tire disposal facility. Exceptionally durable vehicles, such as armored personnel carriers and tanks require torch cutting to reduce them into pieces small enough to transport and process at a steel mill.

The sheer quantity of sub-scaled practice bombs (such as the BDU-33 25-pound practice bomb) consolidated each year from range clearance activity makes a complete re-inspection of these bombs impractical. Instead, they are fed into a mobile rotary crusher unit that is capable of breaking them into small chunks that are acceptable for recycling. Light metal components are magnetically separated from the cast steel bomb bodies after the bombs are crushed. UXO technicians visually scan the material exiting the crusher to ensure that it meets size criteria and contains no intact pyrotechnic spotting charges. They remove all spent spotting charges and contaminated steel fines during this step and set these items aside for introduction to a flashing

unit that heats them to 1,000° F. This step burns off any ignitable phosphorous that remains on the metal after crushing.

The flashing step is an ideal addition to the mechanical harvesting process used to extract BDU-33 bombs from the totally disturbed centers of manned range targets. In these operations, a specially equipped wheeled loader is used by EOD personnel to extract large quantities of practice bombs from the soil at the center of the conventional bull's-eye bombing targets. The loader places these bombs in a dump truck that transports them to the RMCP where they are segregated from other BDU-33s until they can be crushed and flashed. This marriage of mechanical harvesting and machine-based disposal for practice bombs can be accomplished without the need for a hand inspection for UXO or ignitable residues.

Flashing also destroys ignitable residue on aluminum alloy rocket motors and flare containers and burns off other dangerous residue on other metals, such as case fragments from live high-explosive bombs. A fully contained process, the flashing unit selected by the R3 contractor has tested to *de minimus* emissions levels.

Transporting thousands of tons of metal residue from the range each year requires the use of heavy trucks and perhaps hundreds of trips to and from the RMCPs. Contractor support trucks use roll-on-roll-off containers that are loaded and sealed jointly by the prime contract and contracted third party UXO technicians. Both sign certification documents and a logbook indicating that the containers were appropriately sealed. The containers are then transferred under a chain of custody to the mill where they are received and processed, completing the recycling loop.

The Moving Sands and Cactus West target complexes are the only locations requiring regularly scheduled EOD surface clearances within BMGR—West to support ongoing training activities. EOD clearance operations are conducted at these complexes on a once per year basis. Munition deliveries on the Moving Sands and Cactus West targets are limited to inert training practice ordnance of up to 1000 pounds in weight. The clearances at these complexes are limited to the 1,500-foot radius area of the conventional targets and the 500-foot by 5,000-foot area of the Mobile Land Target. Marine Corps EOD teams perform these clearances using procedures similar to those described for the Air Force weapons ranges. Missions and target residue moved from these ranges are consolidated at AUX-2 until a sufficient volume of material is present to justify hiring a R3 type of contractor to demilitarize and remove the munitions and target scrap for recycling or disposal.

APPENDIX C

EVALUATION GUIDELINES FOR INCLUDING OR EXCLUDING ROADS AND OTHER TRADITIONAL TRAVEL ROUTES (WHICH MAY INCLUDE WASHES) IN THE BMGR ROAD INVENTORY FOLLOWING IMPLEMENTATION OF THE PROPOSED INRMP

APPENDIX C

EVALUATION GUIDELINES FOR INCLUDING OR EXCLUDING ROADS AND OTHER TRADITIONAL TRAVEL ROUTES (WHICH MAY INCLUDE WASHES) IN THE BMGR ROAD INVENTORY FOLLOWING IMPLEMENTATION OF THE PROPOSED INRMP

Background Information

An inventory of the existing roads within the BMGR was completed prior to the preparation of this EIS for the proposed range INRMP. This inventory identified about 2,222 miles of existing roads of all types within the range including almost 35 miles of State Route 85 and 66 miles of single-lane, paved roads that provide access to locations in the range interior. There are approximately 23 miles of single-lane, paved roads within BMGR—West that provide access to the rifle range, AUX-2, the Moving Sands and Cactus West target complexes, ordnance jettison area, and the Cannon Air Defense Complex. Approximately 43 miles of single-lane pavement in five separate segments provide access within BMGR—East to Manned Ranges 1, 2, 3, and 4 and to communication facilities on Childs Mountain. Paved roads and parking areas within Gila Bend AFAF and the Cannon Air Defense Complex are excluded from the inventory. The rest of the 2,121 miles of roads inventoried within the range include a variety of improved (i.e., bladed) and unimproved routes with roadbeds composed of sand, gravel, cobbles, rock, or other natural soil materials. Many, if not most, of these roads are unimproved and are less than 12 feet wide. Large proportions of the unimproved roads are little more than primitive cross-country vehicle routes or trails that have been established by repeated vehicle traffic.

Purpose of the Evaluation Guidelines

The roads within the BMGR road inventory have been classified[C-1] within a database that identifies their future management status based on the determinations made through the EIS and proposed INRMP planning process. However, additional previously existing roads or other traditional travel routes (which may include washes or wash segments) or new roads that are not presently identified within the classified road inventory for the range will likely need to be assessed in the future for inclusion in or exclusion from the range transportation system. In addition, some roads that are included in the classified transportation system may be found in the future to: be in excess of military or civilian agency requirements; have fallen into disuse; have excessively deteriorated from overuse or flooding; or be in conflict with resource protection requirements. The purpose of the following guidelines is to provide a systematic method for evaluating the eligibility of roads and traditional travel routes for either inclusion or exclusion in the classified road transportation system for the BMGR. Roads or traditional travel routes excluded from the classified transportation system would be slated for active or passive revegetation and recovery. The use of these guidelines as an evaluation tool by itself would not

[C-1] Classified roads are those roads that have been identified, surveyed, and included in the inventory of BMGR roads and that are classified for government only or government and public use. Other use classifications or limitations applicable to each road may also be identified. Unclassified roads are not intended to be part of, and not managed as part of, the BMGR road transportation system; examples include temporary roads, unplanned roads, off-road vehicle tracks, and abandoned travelways (adapted from U.S. Forest Service).

supplant other requirements that may be applicable pursuant to the NEPA and other relevant laws. Future decision making procedures for including or excluding roads and other traditional travel routes from the classified transportation system for the BMGR will be in accordance with the NEPA and other applicable laws.

Policy for Unclassified Roads and Traditional Travel Routes

The policy for addressing unclassified roads and traditional travel routes would apply to previously existing roads or traditional travel routes or to roads created after the INRMP road inventory maps were displayed at the public workshop in January 2001. Examples of roads or traditional travel routes that would and would not be evaluated for potential inclusion in the classified road transportation system include:

- *Pre-existing roads or traditional travel routes*. Roads or traditional travel routes that have been used in the past as vehicle routes but were inadvertently omitted from the road inventory prepared for the INRMP. The guidelines would be used to evaluate the eligibility of pre-existing roads and traditional travel routes for either inclusion or exclusion in the classified road transportation system when they are identified.

- *Development of a new road to support an identified management purpose.* In this circumstance, the proponent government agency would take the necessary planning and compliance steps in accordance with the NEPA and other applicable laws before implementing development of a proposed road or other associated actions. The guidelines outlined in this appendix would not be directly applicable to this situation, but may be useful for evaluating the need for proposed roads. The assumption is that roads developed through the deliberative NEPA planning process would be eligible for inclusion in the classified road transportation system.

- *Unanticipated and unplanned creation of a new road or activation of an officially closed road by a government agency to provide temporary support for a time-critical law-enforcement/security action, aircraft crash response, government personnel/public safety emergency, or other urgent management situation.* Plans for any needed restoration and remediation of roads created/activated under this scenario would be developed following the conclusion of the time-critical response period. In some cases, this may require agreement on the part of other involved agencies to participate in the development and implementation of restoration/remediation plans. Should the government identify a need for permanent access to an unclassified, new or closed road created or reactivated in response to a time-critical situation, then the appropriate planning and compliance steps would be taken in accordance with the NEPA and other applicable laws to classify the road as a permanent part of the BMGR road transportation system. Under these circumstances, the guidelines outlined in this appendix may be useful for evaluating the proposed continuing need for new or closed roads.

- *Creation of an unanticipated and unplanned road by members of the public or by persons entering the United States illegally from Mexico.* Roads created under these circumstances would not be evaluated for inclusion in the classified BMGR road transportation system. Management actions would be taken to prevent the further use and development of these unclassified, wildcat roads. This policy is intended to preclude any potential for the continued establishment/proliferation of roads on the BMGR, which can

occur when vehicle tracks from off-road travel are driven on repeatedly until an unmaintained road is established. Management steps may also be taken to obliterate and remediate such roads in order to prevent the further use and to promote recovery of the affected natural communities that sustained damage as a result of the road development.

Guidelines for Evaluating Roads and Traditional Travel Routes for Inclusion in or Exclusion from the Classified Road Transportation System of the BMGR

The following evaluation guidelines consist of a series of questions that address the various characteristics, purposes, and conditions of roads or traditional travel routes being considered for inclusion or exclusion from the classified transportation system of the BMGR. Question 1 addresses whether an unclassified road or traditional travel route has a historical context that is relevant to its inclusion in the system. Questions 2 and 3 are designed to determine whether there is a legitimate ongoing or specific demonstrated future requirement for a road (classified or unclassified) or unclassified traditional travel route. Questions 4 through 8 examine the condition of the road or traditional travel route and how continued use or reuse of the road may cause environmental damage.

An underlying premise behind the evaluation guidelines is that all decisions following from these guidelines would be consistent with the INRMP for the BMGR and in accordance with the NEPA and other applicable laws. The evaluation guidelines do not provide a quantified basis upon which to make a decision for or against including or excluding an unclassified or classified road or unclassified traditional travel route in the BMGR road transportation system. Rather, the criteria provided are intended to provide a framework for evaluating:

- the status of a specific road or traditional travel route as a pre-existing/established or newly created motor vehicle route
- the identified continuing need for a road or traditional travel route
- the extent to which the road or traditional travel route alignment can be recognized and driven without the need for detours out of the roadbed or travel route to avoid areas overgrown with vegetation, washouts, or other obstacles
- the extent to which continued or renewed driving use of the road would cause unacceptable environmental damage, including, but not limited to, whether such damage results in a direct loss of habitat or reduction in habitat value or in an impact to adjoining habitat by adversely impacting ecological processes

Well-considered management judgement would be necessary to balance the trade-offs between the perceived need for continuing to use or reuse a road or traditional travel route and the environmental implications of such use. The management policies and goals established by the INRMP must be kept at the forefront of thinking when considering these potential trade-offs.

1. **Road History.** On what basis has the road or traditional travel route been distinguished from wildcat roads or routes created since the January 2001 public workshop for the INRMP? Among the factors to be considered in determining the historical origin of a road or traditional travel route are the following:

   1.1 depiction of the road or traditional travel route on a published map

1.2 the date of the published map on which the road or traditional travel route is depicted and whether the same road or traditional travel route appears on later editions of the same map
1.3 record of the road or traditional travel route in the INRMP road database
1.4 record(s) of the road or traditional travel route in other agency database(s)
1.5 field evidence of the road or traditional travel route condition that demonstrates its historic status
1.6 other evidence of the historical context of the road or traditional travel route

2. **Demonstrated Need.** What is the need for the road or traditional travel route to be included or excluded from the classified BMGR road transportation system? In identifying the answer to this question, consider whether the road or traditional travel route is currently or is known to be needed to support access for:

2.1 military ground troops involved in training activities
2.2 range EOD clearances
2.3 target construction or maintenance
2.4 electronic training instrument construction or maintenance
2.5 other training or training support activities
2.6 routine or periodic law enforcement or security patrols
2.7 other routine or periodic law enforcement or security purposes
2.8 routine or periodic wildlife population surveys
2.9 routine or periodic wildlife habitat evaluations
2.10 routine or periodic wildlife habitat improvement projects (such as the development or maintenance of wildlife waters or forage enhancement plots)
2.11 other routine or periodic natural resource monitoring activities
2.12 routine or periodic natural resource survey activities
2.13 routine or periodic cultural resource monitoring activities
2.14 routine or periodic cultural resource survey activities
2.15 routine or periodic natural or cultural resource research projects
2.16 other routine or periodic natural or culture resource management projects
2.17 management access to the Cabeza Prieta NWR
2.18 public access (including hunting, other wildlife-related recreation, other appropriate recreation, education, or traditional Native American purposes)
2.19 other requirements consistent with the INRMP

3. **Consistency of Public Use with BMGR Safety and Security Requirements and the INRMP.** Would public use of the road or traditional travel route be consistent with current BMGR safety and security requirements, the INRMP, or identified resource protection requirements (such as Sonoran pronghorn management)? If public use of the road or traditional travel route is inconsistent with these requirements, then the road or traditional travel route cannot be incorporated or retained in the BMGR transportation system for the purpose of providing public access.

4. **Condition of the Road or Traditional Travel Route.** Can most of the length of the original road or traditional travel route alignment be readily recognized and driven without damaging reestablished perennial vegetation and without needing to detour from the original roadbed or traditional travel route to avoid such vegetation, impassible driving conditions, or other obstacles? In answering this question, the following factors should be considered:

4.1 the presence of stands of well-established shrubs, trees, or cacti growing within substantial segments of the original roadbed or traditional travel route
4.2 the presence of roadbed or traditional travel route segments that are characterized by deep pulverized soils that would no longer support the passage of a vehicle without the risk that the vehicle would be stranded because of high centering or without generating excessive quantities of fugitive dust
4.3 the presence of wash crossings that have been rendered impassable by the effects of floods or bank erosion
4.4 the presence of deeply eroded roadbed or traditional travel route segments that would retard or prevent the passage of a vehicle within the original roadbed or traditional travel route
4.5 deep down cutting of the original roadbed that has led to its conversion into an active wash

5. **Biological Resources.** Is the road or traditional travel route located within the habitat of a protected or other sensitive species, does its presence or condition adversely impact ecological processes that maintain natural community conservation elements, or does it otherwise adversely impact the connectivity requirements for species and natural community conservation elements?

6. **Soil Stability.** Is the road or traditional travel route located on soils or a slope that are prone to accelerated erosion and has recent disuse of the road or traditional travel route allowed a previously eroded roadbed to restabilize?

7. **Cultural Resources** Would continued or renewed use of the road or traditional travel route impact a known cultural resource site?

APPENDIX D

REPRESENTATIVE ANIMAL AND PLANT SPECIES THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

APPENDIX D

REPRESENTATIVE ANIMAL AND PLANT SPECIES THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative abundance ratings in the following list are as follows:

C = COMMON OR ABUNDANT: nearly always found in the appropriate habitat at the right time of year, occasionally in large numbers.

LC = LOCALLY COMMON: nearly always found in the appropriate habitat, occasionally in large numbers, at the right time of year. This category includes species whose habitat requirements tend to be restricted to localized areas on the BMGR

U = UNCOMMON: Seldom or infrequently found in the appropriate habitat at the right season, although not unusual.

R = RARE: Very low probability of finding the species, but not out of its normal range.

H = HYPOTHETICAL: May be found in the appropriate habitat and season, although unlikely; not enough information is known regarding the extent of the species' range at this time. It has not been found on the BMGR, but may occur there infrequently, or the species may be very difficult to find.

Seasonal Distribution
P= permanent resident
S= summer resident
W= winter resident
T= transient
I = irregular or erratic
CAS=casual
A= accidental
?= status uncertain

Habitat Types listed below are those in which a given species is most likely to be found. Some species are restricted to one or two habitat types, whereas other species are found over a wider range of conditions. Habitat types are defined below as:

OPEN WATER (OW): This habitat type is restricted to managed and natural tanks (tinajas), charcos, playas, ephemeral washes, and road beds that may flood during heavy rains.

DESERT RIPARIAN (DR): Vegetation in or adjacent to ephemeral playas, stream courses, and managed or natural tanks resulting from an increased availability of water. This habitat type consists largely of denser associations of mesquite, blue paloverde, acacia, and ironwood along major washes.

CREOSOTE BUSH DESERTSCRUB (CD): environments dominated by the creosote bush, usually with bursage. Typical of the Lower Colorado River division of the Sonoran Desert Biome, this habitat type is found primarily on level terrain with deeper soil in plains and valleys throughout the BMGR.
MIXED SONORAN DESERTSCRUB (MSD): Characteristic of bajadas, lower mountain slopes, and rocky, rolling hills, these habitats are dominated by a varying combination of paloverde, bursage, ocotillo, brittlebush, saguaro, and other species of cacti. This is the Arizona Upland Division of the Sonoran Desert, and is particularly characteristic of the eastern half of the BMGR.

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
TREES	
Bursera microphylla	Elephant Tree
Canotia holacantha	Canotia
Cercidium sp.	Paloverde
Cercidium floridum	Blue Paloverde
C. microphyllum	Foothill Paloverde
Chilopsis linearis	Desert Willow
Dalea spinosa	Smoke Tree
Olneya tesota	Ironwood
Prosopis spp	Mesquite Tree
Prosopis glandulosa	Honey Mesquite
P. velutina	Velvet Mesquite
SHRUBS AND SEMI-SHRUBS	
Acacia constricta	White Thorn Acacia
A. greggii	Catclaw
Acampptopappus sphaerocephalus	Golden Head
Achyronychia cooperi	Frost Mat
Aloysia wrightii	Oreganillo
Ambrosia ambrosioides	Canyon Ragweed
A. deltoidea	Triangle Leaf Bursage
A. dumosa	White Bursage
A. ilicifolia	Holly-leaved Bursage
Agave deserti	Desert Agave
Asclepias albicans	White-stemmed Milkweed
Atriplex sp.	Saltbush
Atriplex canescens	Four-wing Saltbush
Baccharis brachyphylla	Short-leaved Baccharis
Baccharis sarothroides	Desert Broom
Bebbia juncea	Chuckwalla's Delight, Rush Bebbia
Beloperone californica	Chuperosa
Brandegea bigelovii	Brandegea
Brickellia atractyloides	Brickell-bush
Brickellia incana	Wooly Brickellia
Calliandra eriophylla	Fairy Duster
Cassia armata	Desert Cassia
C. covesii	Desert Senna
Celtis pallida	Desert Hackberry
Condalia globosa	Bitter Condalia
Dalea emoryi	Emory Dalea
D. schottii	Indigo Bush
Ditaxis lanceolata	Narrowleaf Silverbush
Dyssodia porophylloides	San Felipe Dyssodia
Encelia farinosa	Brittlebush
E. frutescens	Rayless Encelia
Ephedra aspera	Popotillo

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
E. nevadensis	Nevada Joint-fir
E. trifurca	Mormon Tea, Long-leaved Joint-fir
Eriogonum fasciculatum	California Buckwheat
E. wrightii	Wright Buckwheat
Fouquieria splendens	Ocotillo
Gallium stellatum	Desert Bedstraw
Haplopappus laricifolius	Turpentine Bush
Hibiscus denudatus	Rock Hibiscus
Hymenoclea monogyra	Burro Brush
H. salsola	Cheese Bush
Hyptis emoryi	Desert Lavender
Jatropha cardiophylla	Limber Bush
J. cuneata	Sangre-de-Cristo
Justica californica	Desert hummingbird-bush, chuparosa
Koeberlinia spinosa	Crucifixion Thorn
Krameria grayi	White Ratany
K. parviflolia	Little-leaved Ratany
Larrea tridentata	Creosote Bush
Lycium andersoni	Anderson Thornbush
L. fremontii	Fremont Thornbush
Menodora scabra	Twinberry
Nolina bigelovii	Bigelow Nolina
Peucephyllum schottii	Desert Fir
Pleurocoronis pluriseta	Arrow Leaf
Porophyllum gracile	Odora
Psilostrophe cooperi	Paper Flower
Rhus kearneyi	Kearney Sumac
Salazaria mexicana	Paper Bag Bush
Simmondsia chinensis	Jojoba
Stephanomeria pauciflora	Desert Straw
S. schottii	Schott's Wire Lettuce
Stillingia linearifolia	Stillingia
Tamarix ramosissima	Tamarisk, Salt Cedar
Tetracoccus fasciculatus var. *halli*	Tetracoccus
Thamnosma montana	Turpentine Broom
Tiquilia canescens	Shrubby Coldenia
T. palmeri	Palmer Coldenia
T. plicata	Plicate Coldenia
Trixis californica	California Trixis
Trichoptilium incisum	Yellow Head
Vaquelinia californica sonorensis	Arizona Rosewood
Viquiera deltoidea	Parish Viquiera, Goldeneye
Yucca schidigera	Spanish Dagger, Mojave Yucca
Zizyphus obtusifolia	Gray-leaved Abrojo
CACTI	
Cereus giganteus	Saguaro

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
Chaenactis carphoclinia	Pebble Pincushion
C. fremontii	Fremont Pincushion
C. stevioides	Esteve Pincushion
Chorizanthe brevicornu	Brittle Spine Flower
C. rigida	Rigid Spiny Herb
Crossosoma bigelovii	Ragged Rock-Flower
Cryptantha angustifolia	Narrow-leaved Cryptantha
C. barbigera	Bearded Cryptantha
C. costata	Ashen Cryptantha
C. maritima	White-haired Cryptantha
C. micrantha	Purple-rooted Cryptantha
C. pterocarya	Wing Nut Cryptantha
C. racemosa	Woody Cryptantha
Echinocactus polycephalus	Cottontop Cactus or Many-headed Barrel Cactus
Echinocereus engelmannii	Hedgehog Cactus
Echinomastus erectocentrus acunensis	Acuna Cactus
Ferocactus acanthodes	Barrel Cactus
F. covillei	Barrel Cactus
F. wislizenii	Barrel Cactus
Mammaillaria tetrancistra	Pincushion Cactus
M. microcarpa	Pincushion Cactus
Opuntia acanthocarpa	Buckhorn Cholla
O. arbuscula	Pencil Cholla
O. basilaris	Beavertail Cactus
O. bigelovii	Teddy Bear Cactus
O. fulgida	Jumping Cholla
O. echinocarpa	Silver Cholla
O. engelmannii	Desert Prickly Pear
O. leptocaulis	Desert Christmas Cholla
Opuntia spp	Cholla
Opuntia spp	Prickly Pear Cactus
O. ramosissima	Diamond Cholla
O. stanlyi	Devil's Cholla
Stenocereus thurberi	Organ Pipe
FORBS AND VINES	
Abronia villosa	Hairy Sand Verbena
Abutilon incanum	Indian Mallow
Acourtig wrightii	Brownfoot
Adenophyllum porophylloides	Dogweed
Allionia incarnata	Trailing Four-O'Clock
Ascelepias subulata	Desert Milkweed
Amaranthus sp	Pigweed
Ambrosia confertifolia	Slimleaf Bursage
Amsinckia tesselata	Fiddleneck
Argythamnia neomexicana	Ditaxis
A. serrata	Saw-toothed Ditaxis

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
A. lanceolata	Lance-leaved Ditaxis
Astragalus spp.	Locoweed
A. crotalariae	Salton Milkvetch
A. lentiginosus	Locoweed
Atricoseris platyphylla	Parachute Plant
Baileya multiradiata	Many-Flowered Desert Marigold
Baileya pauciradiata	Lax Flowers
Boerhavia spp.	Spiderling
Bowlesia incana	Hairy Bowlesia
Brassica nigra	Black Mustard
B. tournefortii	Mustard
Brickellia sp	Brickellia
Calycoseris parryi	Yellow Jack Stem
C. wrightii	White Tack Stem
Camissonia spp.	Cammissonia
C. chamaeneroides	Log-capsuled Primrose
Caulanthus cooperi	Cooper's Cabbage
Cucurbita digitata	Coyote Gourd
Cucurbita palmata	Coyote Melon
Cuscuta umbellata	Dodder
Dalea mollis	Silk Dalea
D. mollissima	Dalea
D. parryi	Parry Dalea or Dune Indigo
Datura discolor	Desert Thorn Apple
Daucus incana	Wild Carrot
Delphinium scaposum	Barestem Larkspur
Descurainia pinnata	Yellow Tansy Mustard
Dichelostemma pulchellum	Bluedicks
Dicoria canescens	Desert Dicoria
Dithyrea californica	Spectacle Pod
D. wislizeni	Spectacle Pod
Draba cuneifolia	Whitlow Grass
Eremalche exilis	Eremalche
E. rotundifolia	Desert Five Spot
Erigeron sp	Fleabane
Eriastrum sp.	Eriastrum
Eriogonum spp.	Wild Buckwheat
E. inflatum	Desert Trumpet
Eriophyllum lanosum	Wooly Eriophyllum
E. wallacei	Wallace Eriophyllum
Erodium cicutarium	Filaree
E. texanum	Large-flowered Heron’s Bill
Eschscholtzia mexicana	Mexican Poppy
E. minutiflora	Little Gold Poppy
Eucrypta micrantha	Small Flowered Eucrypta
Euphorbia albomarginata	Rattlesnake Weed

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
E. eriantha	Desert Poinsettia
E. micromeria	Sonoran Sand Mat
E. polycarpa	Spurge
E. setiloba	Bristle-lobed Sand Mat
Fagonia laevis	Fagonia
Filago arizonica	Arizona Filago
F. depressa	Dwarf Filago
Galium stellatum	Starry Bedstraw
Geraea canescens	Hairy-headed Sunflower
Gilia latifolia	Broad-leaved Gilia
G. stellata	Gilia
Gutierrezia sarothrae	Broom Snakeweed
Helianthus petiolaris	Sunflower
Hesperocallis undulata	Desert (Ajo) Lily
Hibiscus denudatus	Rock Hibiscus
Horsfordia alata	Pink Felt Plant
H. newberryi	Orange Velvet-Mallow
Janusia gracilis	Fermina
Langlosia schottii	Langlosia
Lappula redowskii	Stickseed
L. setosissima	Langlosia
Layia glandulosa	Tidy-tips
Lepidium lasiocarpum	Sand Pepper Grass
Lesquerella gordoni	Gordon Bladderpod
L. tenella	Bladderpod
Linanthus bigelovii	Bigelow Linanthus
L. jonesii	Jones Linanthus
Lotus salsuginosus	Lotus
L. tomentellus	Hairy Lotus
Lupinus sp	Lupine
L. concinnus	Elegant Lupine
L. sparsiflorus	Lupine
Machaeranthera tortifolia	Desert Aster
Malacothrix glabrata	Desert Dandelion
Malva parviflora	Little Mallow
Melilotus indicus	Yellow Sweet Clover
Mentzelia albicans	Blazing Star
M. involucrata	Blazing Star
Mimulus bigelovii	Bigelow Mimulus
Mirabilis bigelovii	Bigelow Four O'Clock
Mohavea confertiflora	Ghost Flower
Monoptilon bellioides	Mohave Desert Star
Nama demissum	Purple Mat
N. hispidum	Sand Bells
Nemacladus glanduliferus	Thread Plant
N. rubescens	Thread Plant

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
N. sigmoideus	Thread Plant
Nicotiana trigonophylla	Desert Tobacco
Oenothera spp	Evening Primrose
O. primaveris	Evening Primrose
Oligomeris linifolia	Linear-leaved Cambess
Orthocarpus purpurascens	Mohave Owl Clover
Palafoxia arida	Spanish Needles
Parietaria hespera	Pellitory
Pectocarya heterocarpa	Hairy-leaved Comb Bur
P. platycarpa	Broad-nutted Comb Bur
P. recurvata	Arch-nutted Comb Bur
Penstemon pseudospectabilis	Mohave Beardtongue
Perityle emoryi	Desert Rock Daisy
Petalonyx thurberi	Thurber Sandpaper Plant
Phacelia spp	Phacelia
Pholisma sonorae	Sand Food
Phoradendron californicum	Desert Mistletoe
Physalis crassifolia	Thick-leaved Ground Cherry
Plagiobothrys jonesii	Jones Popcorn Flower
Plantago insularis	Wooly Plantain
Proboscidea althaeifolia	Desert Unicorn Plant
Psathyrotes ramosisissima	Velvet Rosette
Psilostrophe cooperi	Paper Daisy
Rafinesquia californica	California Chickory
Rafinesquia neomexicana	Desert Chickory
Sarcostemma cynanchoides	Climbing Milkweed
S. hirtellum	Rambling Milkweed
Salvia columbariae	Chia
Senecio mohavensis	Mohave Groundsel
Sisymbrium irio	London Rocket
Sphaeralcea ambigua	Globe Mallow
Stephanomeria panciflora	Desert Straw
Streptanthella longirostris	Long-beaked Twist Flower
Stylocline gnaphalioides	Nest Straw
S. micropoides	Desert Nest-Straw
Teucrium glandulosum	Germander
Tidestromia oblongifolia	Tidestromia
T. lanuginosa	Honey Sweet
Thelypodium lasiophyllum	Thelypodium
Triteleiopsis palmeri	Blue Sand Lily
Verbesina enceloides	Cowpen Daisy
GRASSES	
Aristida spp.	Three-awn
Avena fatua	Wild Oat
Bouteloua spp.	Grama Grass
Bromus rubens	Red Brome

TABLE D-1
REPRESENTATIVE PLANT SPECIES
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

SCIENTIFIC NAME	COMMON NAME
Eragrostis lehmanniana	Lehmann's Lovegrass
Erioneuron pulchellum	Desert Fluff Grass
Festuca arizonica	Arizona Fescue
Heteropogon contortus	Tanglehead
Hilaria rigida	Big Galleta
Hordeum jubatum	Fox-tail Barley
Muhlenbergia microsperma	Littleseed Muhly
M. porteri	Bush Muhly
Nolina begelovii	Bigelow beargrass
Pennisetum ciliare [=Censhrus siliaris] (Non-Native)	Buffelgrass
Schismus arabicus	Arabian Grass
Schismus barbatus	Mediterranean Grass
Sporobolus airoides	Alkali Sacaton
Stipa comata	Needle and Thread
Tridens muticus	Slim Tridens
Vulpia octaflora	Six-weeks fescue

Sources:

Felger, R. S., D. Turner, and M.F. Wilson. 1998. Survey of plants on the Mohawk Dunes on the Barry M. Goldwater Range. Final Report from Drylands Institute to Natural Resources Program, Luke Air Force Base, Arizona, Contract No. 97MS130. 48 pp. + appendices.

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University of Arizona. 1986. Natural Resources Management Plan for Luke Air Force Range.

TABLE D-2
REPRESENTATIVE MAMMALS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical
Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.
Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Order **Insectivora**					
Desert Shrew *Notiosorex crawfordi*	H	X	X		
Order **Chiroptera**					
California Leaf-nosed Bat *Macrotus californicus*	C	X	X	X	X
Long-tongued Bat *Choeronycteris mexicana*	H	X	X		X
Lesser Long-nosed Bat *Leptonycteris curasoae*	UT				X
Yuma Myotis *Myotis yumanensis*	H	X			X
Cave Myotis *Myotis velifer*	LC	X	X		X
Little Brown Myotis *Myotis lucifugus*	H		X		
California Myotis *Myotis californicus*	C	X	X		X
Western Pipistrelle *Pipistrellus hesperus*	C	X	X		X
Big Brown Bat *Eptesicus fuscus*	LC	X			X
Southern Yellow Bat *Lasiurus ega*	H		X		X
Hoary Bat *Lasiurus cinereus*	H	X	X		X
Spotted Bat *Euderma maculata*	H		X		X
Townsend's Big-eared Bat *Plecotus townsendii*	H	X	X		X
Pallid Bat *Antrozous pallidus*	LC	X	X		X
Mexican Free-tailed Bat *Tadarida brasiliensis*	LC	X			X
Pocketed Free-tailed Bat *Tadarida femorosacca*	H	X			X
Big Free-tailed Bat *Tadarida macrotis*	H	X			X
Western Mastiff Bat *Eumops perotis*	R	X			X
Underwood's Mastiff Bat *Eumops underwoodi*	H	X			X
Order **Lagomorpha**					
Desert Cottontail *Sylvilagus audubonii*	C	X	X	X	
Antelope Jack Rabbit *Lepus alleni*	R		X	X	X
Black-tailed Jack Rabbit *Lepus californicus*	C		X	X	X
Order **Rodentia**					
Rock Squirrel *Spermophilus variegatus*	U				X
Round-tailed Ground Squirrel *Spermophilus tereticaudus*	C			X	
Harris' Antelope Squirrel *Ammospermophilus harrisi*	LC				X
Botta's Pocket Gopher *Thomomys bottae*	LC	X	X	X	
Little Pocket Mouse *Perognathus longimembris*	H			X	X
Arizona (Yavapai) Pocket Mouse *Perognathus amplus*	LC			X	X
Desert Pocket Mouse *Chaetodipus penicillatus*	C			X	X
Rock Pocket Mouse *Chaetodipus intermedius*	C				X
Bailey's Pocket Mouse *Chaetodipus baileyi*	LC			X	X
Banner-tailed Kangaroo Rat *Dipodomys spectabilis*	LC			X	X
Desert Kangaroo Rat *Dipodomys deserti*	LC			X	

TABLE D-2
REPRESENTATIVE MAMMALS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical
Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.
Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Merriam's Kangaroo Rat *Dipodomys merriami*	C			X	X
Western Harvest Mouse *Reithrodontomys megalotis*	H	X	X	X	
Cactus Mouse *Peromyscus eremicus*	C	X	X	X	X
Canyon Mouse *Peromyscus crinitus*	LC				X
Deer Mouse *Peromyscus maniculatus*	R	X	X	X	X
Southern Grasshopper Mouse *Onychomys torridus*	U			X	X
White-throated Woodrat *Neotoma albigula*	C	X	X		X
Arizona Woodrat *Neotoma devia*	C			X	X
Order **Carnivora**					
Raccoon *Procyon lotor*	H		X		X
Coati *Nasua nasua*	I		X		X
Coyote *Canis latrans*	C	X	X	X	X
Kit Fox *Vulpes macrotis*	C		X	X	X
Gray Fox *Urocyon cinereoargenteus*	LC	X	X	X	X
Ringtail *Bassariscus astutus*	LC	X	X		X
Badger *Taxidea taxus*	U		X	X	X
Western Spotted Skunk *Spilogale gracilis*	U	X	X		X
Striped Skunk *Mephitis mephitis*	H	X	X		
Hognose Skunk *Conepatus mesoleucus*	H	X	X		X
Mountain Lion *Felis concolor*	R	X	X		X
Bobcat *Felis rufus*	C	X	X	X	X
Order **Perissodactyla**					
Burro *Equus asinus* (introduced species)	U		X		X
Order **Artiodactyla**					
Collared Peccary (Javelina) *Tayassu tajacu*	U	X	X	X	X
Mule Deer *Odocoileus hemionus*	C	X	X	X	X
White-tailed Deer *Odocoileus virginianus*	U	X	X	X	X
Sonoran Pronghorn *Antilocapra americana sonoriensis*	R		X	X	X
Desert Bighorn *Ovis canadensis mexicana*	U	X	X		X

Sources:
Barry, Robert X. 2001a. Various personal conversations and informal e-mail exchanges between Robert X. Barry, Wildlife Biologist, Luke Air Force Base Range Management Office and URS personnel.
Hoffmeister, D.F. 1986. Mammals of Arizona. Tucson: University of Arizona Press. 602 pp.
University of Arizona. 1986. Natural Resources Management Plan for Luke Air Force Range.

TABLE D-3
REPRESENTATIVE REPTILES AND AMPHIBIANS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical
Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.
Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Amphibians					
Couch Spadefoot *Scaphiopus couchi*	LC	X	X		
Sonoran Desert Toad *Bufo alvarius*	C	X	X		
Great Plains Toad *Bufo cognatus*	LC	X	X		
Red-spotted Toad *Bufo punctatus*	C	X	X		
Sonoran Green Toad *Bufo retiformis*	H	X	X		
Canyon Treefrog *Hyla arenicolor*	H	X	X		
Northern Casque-headed Frog *Pternohyla fodiens*	H	X	X		
Great Plains Narrow-mouthed Toad *Gastrophryne olivacea*	H	X	X		
Reptiles					
Desert Tortoise *Gopherus agassizii*	U		X	X	X
Western Banded Gecko *Coleonyx variegatus*	C		X	X	X
Desert Iguana *Dipsosaurus dorsalis*	C		X	X	X
Common Chuckwalla *Sauromalus obesus*	LC			X	X
Zebra-tailed Lizard *Callisaurus draconoides*	C		X	X	X
Colorado Desert Fringe-toed Lizard *Uma notata*	LC	SAND DUNES			
Common Collared Lizard *Crotaphytus collaris*	C		X		X
Large-spotted Leopard Lizard *Gambelia wislizenii*	LC		X	X	X
Desert Spiny Lizard *Sceloporus magister*	C		X	X	X
Clark Spiny Lizard *Sceloporus clarki*	U		X		X
Side-blotched Lizard *Uta stansburiana*	C		X	X	X
Long-tailed Brush Lizard *Urosaurus graciosus*	C		X	X	
Tree Lizard *Urosaurus ornatus*	C		X		X
Desert Horned Lizard *Phrynosoma platyrhinos*	C		X	X	
Flat-tailed Horned Lizard *Phrynosoma mcalli*	R	**YUMA DUNES, SANDY SOIL**			
Regal Horned Lizard *Phrynosoma solare*	LC		X		X
Desert Night Lizard *Xantusia vigilis*	R		X		X
Cowle's Fringe-toed Lizard *Uma notata rufopunctata*	LC	**AEOLIAN SANDS**			
Fringe-toed Lizard *Uma notata*	LC	**AEOLIAN SANDS**			
Canyon Spotted Whiptail *Cnemidophorus burti*	R		X		X
Western Whiptail *Cnemidophorus tigris*	C		X	X	X
Gila Monster *Heloderma suspectum*	U		X	X	X
Western Blind Snake *Leptotyphlops humilus`*	H	X	X	X	
Rosy Boa *Lichanura trivirgata*	U	X	X	X	X
Spotted Leaf-nosed Snake *Phyllorhynchus decurtatus*	LC		X	X	
Saddled Leaf-nosed Snake *Phyllorhynchus browni*	H			X	X
Coachwhip *Masticophis flagellum*	C		X	X	X

TABLE D-3
REPRESENTATIVE REPTILES AND AMPHIBIANS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical
Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.
Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Sonoran Whipsnake *Masticophis bilineatus*	U	X	X	X	X
Western Patch-nosed Snake *Salvadora hexalepis*	C			X	X
Glossy Snake *Arizona elegans*	C		X	X	X
Gopher Snake *Pituophis melanoleucus*	C	X	X	X	X
Common Kingsnake *Lampropeltis getulus*	U	X	X	X	X
Long-nosed Snake *Rhinocheilus lecontei*	C		X	X	X
Black-necked Garter Snake *Thamnophis cyrtopsis*	H	X	X	X	X
Checkered Garter Snake *Thamnnophis marcianus*	H	X	X	X	X
Ground Snake *Sonora semiannulata*	H		X	X	
Western Shovel-nosed Snake *Chionactis occipitalis*	LC		X	X	X
Sonoran Shovel-nosed Snake *Chionactis palarostris*	H		X	X	X
Banded Sand Snake *Chilomeniscus cinctus*	U		X	X	X
Southwestern Black-headed Snake *Tantilla hobartsmithii*	H		X	X	X
Lyre Snake *Trimorphodon biscutatus*	U		X	X	X
Night Snake *Hypsiglena torquata*	C		X	X	X
Western Coral Snake *Micruroides euryxanthus*	R		X	X	X
Western Diamondback Rattlesnake *Crotalus atrox*	C		X	X	X
Speckled Rattlesnake *Crotalus mitchelli*	C				X
Sidewinder *Crotalus cerastes*	C		X	X	X
Black-tailed Rattlesnake *Crotalus molossus*	U		X		X
Tiger Rattlesnake *Crotalus tigris*	U		X	X	X
Mojave Rattlesnake *Crotalus scutulatus*	C		X	X	X
Western spotted leaf-nosed snake *Phyllorhynchus decurtatus perkinsi*	LC		X	X	

Sources:
Barry, Robert X. 2001a. Various personal conversations and informal e-mail exchanges between Robert X. Barry, Wildlife Biologist, Luke Air Force Base Range Management Office and URS personnel.
Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. Boston, Houghton Mifflin Co. 336 pp.
U.S. Fish and Wildlife Service 1995. Amphibians and Reptiles of the Cabeza Prieta National Wildlife Refuge, Ajo, Arizona.
University of Arizona. 1986. Natural Resources Management Plan for Luke Air Force Range.

TABLE D-4
REPRESENTATIVE BIRDS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical
Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.
Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub
Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations
Note: Except for Gambel's quail and the three introduced species (house sparrow, rock dove, and European starling), species on this table are protected by the MBTA.

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
*Killdeer	UT, RW	X	X		
Black Vulture	RS		X	X	X
*Turkey Vulture	CP		X	X	X
Osprey	UT	Big X			
Northern Harrier	CW		X	X	X
Sharp-shinned Hawk	LCT, UW		X		X
Cooper's Hawk	LCT, UW		X	X	X
*Harris' Hawk	UP		X		X
Swainson's Hawk	RT		X	X	X
*Red-tailed Hawk	CP		X	X	X
Ferruginous Hawk	UW		X	X	X
[*] Golden Eagle	RP		X	X	X
Crested Caracara	H			X	X
*American Kestrel	CP		X	X	X
Merlin	RT, RW		X	X	X
[*] Peregrine Falcon	RT		X		X
*Prairie Falcon	UP		X	X	X
*Gambel's Quail	CP		X	X	X
*Rock Dove (introduced species)	CP	Urban developed areas			
Band-tailed Pigeon	UW	Montane pine forests			
*White-winged Dove	CS		X	X	X
*Mourning Dove	CP		X	X	X
Inca Dove	RT?	Human settlements			
Common Ground-Dove	RS		X	X	X
*Greater Roadrunner	UP		X	X	X
*Common Barn-Owl	UP		X	X	X
*Western Screech-Owl	LCP		X		X
*Great Horned Owl	CP		X	X	X
Ferruginous Pygmy-Owl	H		X		X
*Elf Owl	CS, RW		X		X
*Burrowing Owl	LCS			X	
Long-eared Owl	RW		X		X
Short-eared Owl	RW		X	X	X
*Lesser Nighthawk	US, RW	X	X	X	X
*Common Poorwill	CS, RW	X	X	X	X
Vaux's Swift	UT		X	X	X
Black Swift	RT				X

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REPRESENTATIVE BIRDS
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Note: Except for Gambel's quail and the three introduced species (house sparrow, rock dove, and European starling), species on this table are protected by the MBTA.

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
*White-throated Swift	US, SW	X	X	X	X
[*] Black-chinned Hummingbird	UT		X	X	X
[*] Anna's Hummingbird	RT, RW		X		X
*Costa's Hummingbird	CS, UW		X	X	X
Calliope Hummingbird	RT		X		X
Rufous Hummingbird	UT		X		X
Allen's Hummingbird	CAS		X	X	X
Broad-tailed Hummingbird	RT				X
Belted Kingfisher	RT	X	X		
*Gila Woodpecker	CP		X		X
Red-naped Sapsucker	RT		X		X
*Ladder-backed Woodpecker	CP		X	X	X
Northern Flicker (Red-shafted)	CW		X	X	X
*Northern Flicker (Gilded)	CP		X	X	X
Olive-sided Flycatcher	RT		X		X
Western Wood-Pewee	UT		X		X
Willow Flycatcher	UT		X		
Hammond's Flycatcher	RT		X		
Dusky Flycatcher	RT		X		X
Gray Flycatcher	CT, RW		X	X	X
Western (Pacific Slope) Flycatcher	UT		X		
Black Phoebe	RT, RW	X	X		
*Say's Phoebe	RS, CW		X	X	X
*Vermilion Flycatcher	US	X	X		
*Ash-throated Flycatcher	CS, UW		X	X	X
*Brown-crested Flycatcher	LCS				X
Tropical Kingbird	CAS		X		
[*]Western Kingbird	LCS		X	X	X
Cassin's Kingbird	UT		X	X	X
*Horned Lark	UP			X	
*Purple Martin	RS				X
Tree Swallow	RT	X	X	X	X
Violet-green Swallow	UT	X	X	X	X
[*]Northern Rough-winged Swallow	UT, RS	X	X	X	X
Bank Swallow	RT	X	X	X	X
Cliff Swallow	UT	X	X	X	X
Barn Swallow	UT	X	X	X	X
*Common Raven	CP	X	X	X	X

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REPRESENTATIVE BIRDS
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Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations
Note: Except for Gambel's quail and the three introduced species (house sparrow, rock dove, and European starling), species on this table are protected by the MBTA.

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Mountain Chickadee	RT		X	X	X
*Verdin	CP		X	X	X
Red-breasted Nuthatch	CAS		X		
*Cactus Wren	CP		X	X	X
*Rock Wren	CP		X	X	X
*Canyon Wren	CP		X		X
Bewick's Wren	UW		X		X
House Wren	UT, UW		X		X
Ruby-crowned Kinglet	CW, CT		X		X
Blue-gray Gnatcatcher	RW		X		
*Black-tailed Gnatcatcher	CP		X	X	X
Western Bluebird	RI		X	X	X
Mountain Bluebird	UW		X	X	X
Townsend's Solitaire	UW		X	X	X
Swainson's Thrush	UT		X		
Hermit Thrush	UT, RW		X		
American Robin	UW		X	X	X
*Northern Mockingbird	LCP		X	X	X
Sage Thrasher	UT, RW		X	X	X
*Bendire's Thrasher	RP		X	X	
*Curve-billed Thrasher	CP		X	X	X
*Crissal Thrasher	UP		X		
*Le Conte's Thrasher	LCP			X	X
Water Pipit	RT	X			
*Phainopepla	CP		X	X	X
*Loggerhead Shrike	LCP, LCW		X	X	X
*European Starling (introduced species)	UP	Urban developed areas			
*Bell's Vireo	CS		X		
Gray Vireo	UW, LCT		X		X
Solitary Vireo	CT		X		X
Warbling Vireo	CT		X		X
Tennessee Warbler	UT		X	X	X
Orange-crowned Warbler	RW, CT		X	X	X
Nashville Warbler	CT		X	X	X
*Lucy's Warbler	US		X		X
Virginia's Warbler	RT		X	X	X
[*]Yellow Warbler	CT		X	X	X
Yellow-rumped Warbler	CT, CW		X	X	X

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REPRESENTATIVE BIRDS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

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Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub
Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations
Note: Except for Gambel's quail and the three introduced species (house sparrow, rock dove, and European starling), species on this table are protected by the MBTA.

	HABITAT TYPE				
	RA	OW	DR	CD	MSD
Black-throated Gray Warbler	CT, RW		X	X	X
Townsend's Warbler	UT		X		
Hermit Warbler	UT		X		X
MacGillivray's Warbler	CT		X		
Common Yellowthroat	RT	X	X		X
Wilson's Warbler	CT	X	X	X	X
Yellow-breasted Chat	RT	X	X		
Summer Tanager	CAS		X		
Western Tanager	CT		X		X
*Northern Cardinal	UP		X		X
*Pyrrhuloxia	UP		X		
Black-headed Grosbeak	CT		X		X
[*]Blue Grosbeak	RT, RS		X		
Lazuli Bunting	UT		X		X
[*]Varied Bunting	RS				X
Green-tailed Towhee	CT, UW		X		X
Rufous-sided (Spotted) Towhee	UW		X		
*Canyon Towhee	UP		X		X
Brown Towhee	UP		X		X
Cassin's Sparrow	RS, RW		X		X
Rufous-crowned Sparrow	UP		X	X	X
Rufous-winged Sparrow	UP		X	X	X
Chipping Sparrow	UT, RW		X	X	X
Brewer's Sparrow	CW		X	X	X
Black-chinned Sparrow	RT		X		X
Vesper Sparrow	UW		X	X	
Lark Sparrow	UT, RW		X		X
*Black-throated Sparrow	CP		X	X	X
Sage Sparrow	UW			X	X
Lark Bunting	OW		X	X	X
Savannah Sparrow	UW		X	X	X
Grasshopper Sparrow	RW		X	X	
Fox Sparrow	RW		X		
Song Sparrow	CAS		X		
Lincoln's Sparrow	UT, RW		X		X
White-crowned Sparrow	CW		X	X	X
Dark-eyed Junco (Oregon/Gray-headed)	UW		X	X	X
Red-winged Blackbird	RT	X	X		

TABLE D-4
REPRESENTATIVE BIRDS
THAT MAY OCCUR ON THE BMGR AND CABEZA PRIETA NWR

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Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations
Note: Except for Gambel's quail and the three introduced species (house sparrow, rock dove, and European starling), species on this table are protected by the MBTA.

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
*Western Meadowlark	CW			X	X
Yellow-headed Blackbird	LCT	X	X		
Brewer's Blackbird	UT	X	X		
*Bronzed Cowbird	US		X		
*Brown-headed Cowbird	CT, LCS		X		X
*Hooded Oriole	US		X		
[*]Northern Oriole	CT		X		
*Scott's Oriole	LCS				X
Cassin's Finch	CAS	Montane pine forests			
*House Finch	CP		X	X	X
Pine Siskin	RT		X		X
American Goldfinch	RT		X		X
[*]Lesser Goldfinch	RS, UW		X		X
Lawrence's Goldfinch	RI		X		X
Evening Grosbeak	CAS		X		
House Sparrow (introduced species)	UP	Urban developed areas			

Sources:

Arizona Game and Fish Department. 2001. Arizona Breeding Bird Atlas Data for the BMGR. 1993-2000.
American Ornithologists' Union. 1983. Checklist of North American Birds, sixth edition. Baltimore, American Ornithologist Union and supplement in Auk 1993.
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Rosenberg., K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River Valley. Tucson: The University of Arizona Press. 416 pp.
University of Arizona. 1986. Natural Resources Management Plan for Luke Air Force Range.

TABLE D-5
BIRD SPECIES THAT MAY HYPOTHETICALLY OCCUR[1] ON THE BMGR AND CABEZA PRIETA NWR

[1] The bird species listed on this table are those that are only expected to occur on the BMGR and Cabeza Prieta NWR on a hypothetical basis or as the result of some anomaly. While two hypothetical bird species were also included in Table D-4, the presence of those species has been studied and the hypothetical basis for their potential presence more adequately documented; the presence of the bird species listed on this table has not been studied.

[2] Species listed on this table are protected by the MBTA.

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical

Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.

Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Pied-billed Grebe	RT	X			
Eared Grebe	RT	X			
Great Blue Heron	RT	X			
Snowy Egret	RT	X			
Cattle Egret	UT	X		X	
Green Heron	RT	X			
Black-crowned Night Heron	RT	X			
Canada Goose	CAS	X	X		
Green-winged Teal	UW	X			
Mallard	RW	X			
Northern Pintail	RT	X			
Cinnamon Teal	UT	X			
Northern Shoveler	RW	X			
Gadwall	RW	X			
American Wigeon	RT	X			
Ring-necked Duck	RW	X			
Lesser Scaup	RT	X			
Common Goldeneye	CAS	X			
Bufflehead	RT	X			
Common Merganser	CAS	X			
Ruddy Duck	RT	X			
Virginia Rail	CAS	X	X		
Sora	RT	X	X		
Black-necked Stilt	UT	X			
American Avocet	RT	X			
Greater Yellowlegs	RT	X			
Solitary Sandpiper	RT	X			
Willet	CAS	X			
Spotted Sandpiper	UT, RW	X			
Long-billed Curlew	CAS	X			
Western Sandpiper	UT	X			
Least Sandpiper	UT	X			
Baird's Sandpiper	RT	X			

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[1] The bird species listed on this table are those that are only expected to occur on the BMGR and Cabeza Prieta NWR on a hypothetical basis or as the result of some anomaly. While two hypothetical bird species were also included in Table D-4, the presence of those species has been studied and the hypothetical basis for their potential presence more adequately documented; the presence of the bird species listed on this table has not been studied.

[2] Species listed on this table are protected by the MBTA.

Relative Abundance (RA); C=Common or Abundant; LC=Locally Common; U=Uncommon; R=Rare; H=Hypothetical

Seasonal Distribution: P= permanent resident; S= summer resident; W= winter resident; T= transient; I = irregular or erratic; CAS=casual, A= accidental; ?= status uncertain.

Habitat Types: OW=Open Water; DR=Desert Riparian; CD=Creosote Bush Desertscrub; MSD=Mixed Sonoran Desertscrub

Breeding Status: *= breeding is known to occur; [*]= breeding suspected, but no recorded observations

	HABITAT TYPE				
	RA	**OW**	**DR**	**CD**	**MSD**
Common Snipe	RT	X			
Long-billed Dowitcher	CAS	X			
Wilson's Phalarope	UT	X			
Red-necked Phalarope	CAS	X			
Red Phalarope	CAS	X			
Ring-billed Gull	CAS	X			
Black Tern	CAS	X			
Steller's Jay	RI		X	X	X
Scrub Jay	RI		X	X	X
Sprague's Pipit	CAS	Short grass with open patches			
Cedar Waxwing	CAS		X		X
Chestnut-collared Longspur	CAS	Dense grass			

Sources:

American Ornithologists' Union. 1983. Checklist of North American Birds, sixth edition. Baltimore, Am. Ornithologist Union and supplement in Auk 1993.

Barry, Robert X. 2001a. Various personal conversations and informal e-mail exchanges between Robert X. Barry, Wildlife Biologist, Luke Air Force Base Range Management Office and URS personnel.

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Monson, G. and A.R. Phillips. 1981. Annotated Checklist of the Birds of Arizona. Tucson: University of Arizona Press. 240 pp.

Rosenberg., K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River Valley. Tucson: The University of Arizona Press. 416 pp.

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APPENDIX E

ARIZONA BREEDING BIRD ATLAS BREEDING CODES

APPENDIX E

ARIZONA BREEDING BIRD ATLAS BREEDING CODES[E-1]

CODE	INTERPRETATION
Observed (OB)	Non-breeder or migrant **observed** in block during breeding season, but not believed to be breeding. Used to address species in unlikely breeding habitat, flying over the block or out of their normal breeding range and with no indication of breeding; for example, could apply to ducks summering on a pond with no breeding habitat or a great blue heron foraging when no heronry exists on the block.
Possible (PO)	Based on one of the following: Species **observed** in suitable nesting habitat during its breeding season. Used to address birds seen in likely breeding habitat, such as a western tanager in a ponderosa pine forest; however, caution is necessary during the migration period of birds that may be passing through or for birds that may linger on wintering areas before concluding possible breeding. Additionally, some wintering species may be present in late winter and early spring in the desert, while some resident species have commenced breeding. ***or*** **Singing male** present in suitable nesting habitat during its breeding season.
Probable (PR)	Based on one of the following: **Pair** observed in suitable habitat during its breeding season. Applies to situations when a male and female of the same species are seen in the right habitat, though some birds (for example, ducks) are often paired during migration. ***or*** Permanent territory presumed through **song** at same location on at least 2 occasions 7 days or more apart. ***or*** Permanent **territory** presumed through defense of territory (chasing individuals of the same species). ***or*** **Courtship** behavior or **copulation** between a male and female. Includes courtship displays or food exchange. ***or*** Visiting probable **nest-site**, but no further evidence obtained. Applies to a bird that consistently flies into the same likely nest site, but which provides insufficient behavior for upgrading to confirmed. Applies especially to hole-nesters. ***or*** **Agitated** behavior or anxiety calls of adult, indicating nest site or young in the vicinity. Two birds circling above or a goshawk distress call falls into this category. Does not include agitation that is induced by "pishing" or using taped calls. ***or*** Nest **building** by wrens or excavation of cavities by woodpeckers, chickadees and nuthatches. Woodpeckers and other cavity excavators usually make only one nest hole, but use other holes for roosting; wrens will build several nests before a female selects one, and unmated males do this too.

[E-1] Modified from Corman (1994).

ARIZONA BREEDING BIRD ATLAS BREEDING CODES[E1] (continued)

CODE	INTERPRETATION
Confirmed (CO)	Based on one of the following: Bird seen **carrying nesting** material (that is, sticks, grass, mud, and cobwebs). Applies for all species except wrens. ***or*** **Nest building** seen at the actual nest site, excluding wrens, woodpeckers, chickadees and nuthatches. ***or*** **Distraction displays**, defense of unknown nest or young or injury feigning. Used if adult bird is seen trying to lead people away from nest or young. Commonly seen in most ground nesters, this is the typical killdeer broken-wing act. This also includes active defense such as a Cooper's hawk diving at an intruder. Does not include agitated behavior. ***or*** **Used nest** or eggshells found. Unless carefully identified, used only for unmistakable egg shells and nests that were used during the atlas period. Magpie nests, for example, are characteristic. ***or*** Recently **fledged** young of altricial species incapable of sustained flight or downy young of precocial species restricted to the natal area by dependence on adults or limited mobility. A duck brood on an isolated pond merits this code, but barely fledged blackbirds and swallows may fly considerable distances. The presence of young cowbirds confirms both the cowbird and the host. ***or*** **Occupied nest** indicated by adult entering or leaving nest site in circumstances indicating an occupied nest, including those in high trees, cliffs, cavities, and burrows in which the contents of the nest and incubating or brooding adult cannot be seen. ***or*** Adults seen **carrying food** for the young. Some birds, especially corvids and raptors, may carry food some distance before eating it themselves. ***or*** Adults feeding recently **fledged young**. Young cowbirds begging food confirm both the cowbird and the host. ***or*** Adult carrying **fecal sac**. Many passerines keep their nests clean by carrying fecal sacs away from the nest. ***or*** **Nest** with **eggs** found. Same cautions as under **used nest** apply here. Cowbird eggs confirm both the cowbird and the host. ***or*** **Nest** with **young** seen or heard. Used when young actually seen or, as with most cavity nesters, when young only are heard. A cowbird chick in the nest confirms both the cowbird and the host.

APPENDIX F

BIOLOGICAL OPINION FOR THE INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN FOR THE BARRY M. GOLDWATER RANGE, AZ 02-21-05-F-0492

United States Department of the Interior
U.S. Fish and Wildlife Service
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In Reply Refer to:
AESO/SE
02-21-05-F-0492

August 26, 2005

Mr. Ron Pearce, Director
Range Management Department
Marine Corps Air Station
Box 99134
Yuma, Arizona 85364

Mr. James R. Uken, Director
56th Range Management Office
Luke Air Force Base
7224 North 139th Drive
Luke AFB, Arizona 85309-1420

RE: Biological Opinion for the Integrated Natural Resource Management Plan for the Barry M. Goldwater Range, Arizona

Dear Mr. Pearce and Mr. Uken:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated June 14, 2005, and received by us on June 17, 2005. At issue are impacts that may result from the proposed Integrated Natural Resource Management Plan (INRMP) for the Barry M. Goldwater Range (BMGR), located in Yuma and Maricopa counties in southwestern Arizona. The proposed action may affect Sonoran pronghorn (*Antilocapra americana sonoriensis*, pronghorn).

In your letter, dated May 12, 2005 and received by us on May 17, 2005, you requested our concurrence that the proposed action was not likely to adversely affect the pronghorn, lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*, bat), and the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*, pygmy-owl). We sent you a letter, dated June 10, 2005, concurring that the proposed project was not likely to adversely affect the bat and pygmy-owl, but stated that we believed the proposed project may adversely affect the pronghorn.

This biological opinion is based on information provided in the "Final Environmental Impact Statement, Barry M. Goldwater Range, Proposed Integrated Natural Resources Management Plan, May 2005" (FEIS) and other sources of information as detailed in the consultation history. Literature cited in this biological opinion is not a complete bibliography of all literature available

on the species of concern; management, monitoring, and recreational activities and their effects; or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at the Phoenix, Arizona, Ecological Services Office (AESO).

CONSULTATION HISTORY

- 2001-2005: Staff from our agencies met numerous times to collaboratively develop the INRMP and to discuss the proposed action and its potential effects on pronghorn and other listed species.

- May 17, 2005: We received your letter, dated May 12, 2005, requesting our concurrence that the proposed action was not likely to adversely affect the pronghorn, bat, and pygmy-owl.

- May 27, 2005: We recommended, during a telephone conference, that you request formal consultation on the proposed action and its effects on the pronghorn.

- June 10, 2005: We sent you a letter concurring that the proposed project was not likely to adversely affect the lesser long-nosed bat and cactus ferruginous pygmy-owl, but disagreeing that the proposed project was not likely to adversely affect the pronghorn. We stated that, while the proposed action will confer overall management benefits to the pronghorn, we believe some components of the proposed project are likely to adversely affect the species.

- June 17, 2005: We received your letter, dated June 14, 2005, requesting formal consultation on the proposed action and its effects on the pronghorn. We initiated formal consultation.

- July 20, 2005: We issued a draft biological opinion.

- August 2, 2005: We received an electronic mail from the Marine Corps Air Station, Yuma (MCAS) indicating the MCAS had reviewed the draft biological opinion and was satisfied with the document.

- August 11, 2005: We received a letter from the Luke Air Force Base (LAFB) indicating the LAFB had reviewed the draft biological opinion and was satisfied with the document.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The Marine Corps Air Station (MCAS) and Luke Air Force Base (LAFB) propose to implement an INRMP for the BMGR (See Tables and Figures, Figure 1), located in Yuma and Maricopa

counties in southwestern Arizona. The INRMP is a new natural resources management plan for BMGR that will extend to the year 2024. The new management plan is needed to address changes in current and future military mission requirements, Department of Defense (DoD) management policies, and BMGR resource and public use conditions that have changed since the most recent previous resource management plan was prepared for the range[1]. Furthermore, the Military Lands Withdrawal Act (MLWA) of 1999 requires that the Secretaries of the Air Force, Navy, and Interior jointly prepare an INRMP for the BMGR in accordance with the Sikes Act[2]. As stipulated by the MLWA of 1999, the purposes of the INRMP must be to provide for the "proper management and protection of the natural and cultural resources of [the range], and for sustainable use by the public of such resources to the extent consistent with the military purposes [of the BMGR]."

The INRMP is described in the Preferred Alternative (Sections 3.4.2 and 3.4.4.2 and Tables 3-3 and 3-5 through 3-13) of the FEIS. The study area for the INRMP is described in Section 1.5.2 and differs for the various resource elements assessed (e.g., the study area for natural communities and special status species includes their contiguous distribution both on and off of the range). The action area for this biological opinion is defined as the current range of the pronghorn within the U.S., plus areas of BMGR-West (from the Copper and Cabeza Prieta mountains to the western boundary of the BMGR in the Yuma Desert) and BMGR-East (East TAC and aircraft routes to East TAC) not currently occupied by pronghorn but where INRMP activities are proposed. The action area is fully described in the Environmental Baseline section of the 2003 opinions included here by reference (biological opinions on MCAS-Yuma's Arizona portion of the Yuma Training Range Complex (YTRC) – BMGR-West (02-21-95-F-0114R4), and Luke Air Force Base's military activities on the BMGR-East (02-21-96-F-0094R2)).

The INRMP includes both existing actions that will be carried forward and new actions. It proposes public use restrictions, authorizations, and permitting on portions of the BMGR regarding camping, vehicle use, shooting, entry into mines, firewood collection and use, rockhounding, and other activities; natural resources monitoring, surveys, and research; habitat restoration; wildlife water developments; development of a wildfire management plan; law enforcement; limitations on the locations of future utility projects and the Yuma Area Service Highway; control of trespass livestock; and designation of special natural/interest areas, while allowing other designations to expire. The management strategy of the INRMP addresses 17 resource management elements, which are detailed in the EIS and summarized as follows:

1. Resource Inventory and Monitoring

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[1] The most recent resource management plan for the range is the Lower Gila South Resource Management Plan (RMP) Goldwater Amendment (hereinafter Goldwater Amendment) that was prepared by the BLM. The Goldwater Amendment, which was placed into effect in 1990, was prepared under the purviews of the MLWA of 1986 and the Federal Land Policy Management Act (FLPMA) of 1976 (43 U.S.C. 1701 et seq.). The Goldwater Amendment is based on management planning and environmental assessments that were completed during the early to late 1980s.

[2] The Sikes Act sets forth the Nation's resource management policies and guidance for U.S. military installations and requires the preparation of INRMPs for all installations with significant natural resources, including those (such as the BMGR) composed of withdrawn lands. The Sikes Act provides that the "... Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources on military installations..." and that an INRMP is to be prepared to facilitate implementation of that program.

- Ecosystem and limits of acceptable change monitoring systems will be developed and implemented for the BMGR and increase the extent and intensity of resource surveys (new action).
- Additional vegetation and wildlife surveys, in particular, will be conducted to monitor the ecosystem health and biodiversity (new action).
- Ecosystem monitoring will detect trends within the BMGR ecosystem that would indicate overall biodiversity and health (new action).
- Limits of acceptable change monitoring will be used to track key indicators of environmental impacts resulting from recreation and other uses.
- Adaptive responses, based on monitoring results, will redirect management measures as necessary to ensure that resource conservation, rehabilitation, and protection goals are met and that recreation use continues to be sustainable (new action).

2. Special Natural/Interest Areas

- The Flat-tailed Horned Lizard Habitat Management Area and the three previously designated Areas of Critical Environmental Concern (ACECs) will be redesignated as special natural/interest areas (no functional change).
- The two Special Recreation Management Areas (SRMAs) and El Camino del Diablo Backcountry Byway will not be redesignated, but will be afforded the same resource conservation, protection, and management measures put in place for the immediate locality and entire BMGR (new action).
- Special geological, scenic, cultural, or other resource areas could be evaluated in the future to determine the appropriateness of establishing additional special natural/interest areas as conservation, rehabilitation, or protection tools (new action).

3. Motorized Access and Unroaded Area Management

Of the 2,222 miles of existing roads within the BMGR, approximately 30 percent, or 616 miles, will be closed under the proposed action (new action). Of these 616 miles, approximately 303 miles are in areas of the BMGR that, in general, are currently accessible for public use, reducing the extent of roads open for public use from 981 miles to 678 miles. Approximately 91 percent of the reduction in available general public access road mileage will occur in BMGR—West, which is managed by the Marine Corps, where 277 miles of the 767 miles currently available will be closed. In BMGR—East, which is managed by the Air Force, 26 of the 214 miles of road currently available for general public access will be closed. Most of the roads in the BMGR that will be closed are redundant; that is, other nearby roads provide access to the same area. Other roads will be closed to (1) protect certain natural or cultural resources, (2) arrest deteriorating conditions that are accelerating soil erosion, (3) prevent unnecessary reopening of naturally revegetated roads that are not needed for military or other official purposes, or (4) benefit Sonoran pronghorn, a federally listed endangered species that depends on the BMGR for 42

percent of its remaining available habitat in the United States. The other 313 miles of the total 616 miles of road to be closed are roads that are currently available for use only by the military or other agencies, resulting in 928 miles remaining from the 1,241 miles of road currently available for government use only. Of the 928 miles of roads to be retained but restricted to government use only, 51 miles are within locations that are generally open to the general public, but where access to the road is reserved for official use only to protect public safety relative to military operation, protect or restore natural or cultural resources, and/or facilitate the effectiveness of international border law enforcement (new action). Of these 51 miles of roads, 39 miles are in BMGR—West and 12 miles are in BMGR—East. The preferred action will continue to provide adequate access for sustainable public use of those areas of the BMGR that can be made available for such use. However, some roads that will be closed will reduce access within localized areas.

- Site-specific planning will be authorized for two bypass roads (totaling approximately 7 miles) to reroute primarily Border Patrol traffic around, rather than through, the Cabeza Prieta National Wildlife Refuge (NWR)/Wilderness (new action).

- In some areas, closed roads may be actively restored to remediate a degraded ecological process or to enhance wildlife usage. Other closed roads will be allowed to revegetate naturally (new action).

- Unroaded areas of 3,001 acres or more will be conserved to the extent that such conservation is compatible with military or agency missions to reduce the potential for ecosystem fragmentation or damage to cultural resources and benefit protected species (new action). Assuming that the roads closed under the preferred alternative are revegetated over the long term, the range-wide elimination of 616 miles of road will reduce the number of unroaded areas in the BMGR but increase the average size of unroaded blocks because smaller areas will be combined into larger blocks of unroaded areas. The largest unroaded area will be slightly more than 102,000 acres located within BMGR—East. The largest unroaded area in BMGR—West will be nearly 85,000 acres.

4. **Camping and Visitor Stay Limits**

- Dispersed, self-contained camping (non-vehicle based) will continue to be allowed in all areas open to the public (no change).

- Vehicle-based camping will continue to be allowed along most roads designated as open to public use (no change), although some road segments and specific areas will be closed to protect resources that are sensitive to human-induced disturbances (new action). Vehicles will continue to be allowed to pull up to 50 feet off the road, although campsites could be located farther from the road (no change).

- An assessment will be completed to determine the appropriateness of establishing designated camping areas (new action).

- Vehicle-based camping stays will continue to be limited to 14 consecutive days within a 28-day period except by special use permit (no change).

- Rules will be prescribed to ensure that the disposal of human sewage and solid waste is in accordance with applicable Federal, State, and local regulations (new action).

5. Recreation Services and Use Supervision

- Public off-road vehicle travel and also on- and off-road racing will continue to be prohibited (no change).

- Motorized public travel in washes will be prohibited except where the wash is a designated as part of the road system open to the public and is dry (no change).

- In most areas (except Management Unit 2), a special use permit will be required for any single party with 10 or more vehicles. In Management Unit 2, a special use permit will be required for any single party with 20 or more vehicles (new action).

- All vehicles and operators will continue to be required to comply with general vehicle operating rules, including being licensed for highway driving under Arizona laws and regulations (no change).

- Visitors will continue to need a permit to access the BMGR (no change).

- New public education and recreation use programs will be developed and implemented to inform the public about road restrictions and resource sensitivities (new action).

- A minimum of six law enforcement officers will be retained and dedicated to the BMGR (new action).

- The effects of recreation use on natural and cultural resources will be monitored. If damage occurs that exceeds pre-determined limits of acceptable change, management actions will be taken to reduce and/or remediate the damage (new action).

- Signs, gates, and fences will be installed based on a needs assessment. Roads that are open to public use will be marked as open (new action). If a road does not have a sign that indicates that it is open, drivers will have to consider it closed (new action).

- Recreation use records and statistics will be developed and maintained (new action).

- Recreational use of metal detectors and entry to mines will be prohibited (new action).

6. Rockhounding

- Rockhounding for personal use (removing up to 25 pounds of rock per individual per trip and 250 pounds per individual per year) will be allowed in portions of BMGR—West

(Management Units 2 and 3) except within special natural/interest areas and other designated areas where resources are sensitive to human-induced disturbances. Rockhounding will be prohibited in other parts of the BMGR (new action).

7. **Wood Cutting, Gathering, and Use, and Collection of Native Plants**

- The use of dead and downed wood for campfires will continue to be allowed in most areas that are open to the public (that is, in Management Units 2, 3, and 6). Wood cutting, gathering, and native wood campfires will be prohibited in Management Unit 1 (which includes most of the former Tinajas Altas Mountains ACEC). If wood supplies become depleted in high-use areas, additional restrictions could be implemented (new action).

- Wood cutting and wood gathering for purposes other than campfires will be prohibited throughout the range. Removal of wood from the range will also be prohibited (no change).

- Collection or salvage of native plants will continue to be prohibited in accordance with the Arizona Native Plant Law (no change). Collection of native plants will be allowed for protected Native American purposes (new action).

8. **Hunting**

- Existing game management programs will continue (no change).

- An assessment will be conducted to determine if it will be appropriate to establish a special hunting permit program that requires payment of a nominal fee to be used for the protection, conservation, and management of wildlife, including habitat improvement (new action).

- The effects of non-game species collection on wildlife, habitat, and other resources will be evaluated and, if warranted, such collection will be limited or restricted within the authority of State law (new action).

9. **Recreational (Target) Shooting**

- Recreational shooting will continue to be allowed under existing regulations as long as it is compatible with military use and public safety, and no significant resource issues are identified (no change).

- A special use permit will be required to shoot between sunset and sunrise or to use automatic weapons (new action).

- An assessment will be conducted on the appropriateness of recreational shooting on the BMGR, including the potential for designating specific shooting areas (new action).

10. Utility/Transportation Corridors

- Construction of the Yuma Area Service Highway (ASH) within a right-of-way that passes through the northwestern corner of BMGR—West will be allowed (no change).
- Non-military utilities will continue to be restricted to the established utility corridor along State Route 85 and the inactive Tucson Cornelia and Gila Bend Railroad (no change).

11. General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters

- Procedures will be developed to control all trespass livestock grazing (new action).
- Actions will be taken to prevent, control, and eradicate the spread of invasive species commensurate with the threats these species pose to natural resources (new action).
- Restrictions on activities will be implemented in key areas if needed to protect and conserve habitat, ecosystems, or biodiversity (new action).
- Areas damaged by a discontinued military, agency, or extensive public use will be restored by passive or active management actions (new action).
- New wildlife water developments will be limited to six high-priority developments in the first five years of the INRMP. Concurrently, an assessment of the beneficial and adverse effects of water developments will be conducted and used to determine whether the programs should be continued or permanently suspended on the BMGR (new action).

12. Special Status Species

- Meet and support all existing and future compliance requirements for the protection and conservation of special status species (no change).
- Surveys for special status species will be conducted on an as-needed basis and used to update lists of species that occur on the BMGR as well as species distribution and abundance (no change).
- Habitat improvements will be made in support of endangered species recovery plans (no change).
- Resources will be provided, as necessary, for predator control to protect a special status species (new action).

13. Soil and Water Resources

- Measures will be taken to continue to prevent soil erosion, water pollution, and groundwater depletion (no change).

- A range-wide soil survey using Natural Resource Conservation Service standards will be conducted to provide information on soil types, erosion risks, and soil vulnerability to disturbances (new action).

- Vehicular and construction activities will be restricted when soils are susceptible to a heightened risk of erosion, and areas of excessive surface damage from past activities will be restored (new action).

14. Air Resources

- Actions will continue to be taken to control fugitive dust at construction sites and to prevent non-point source air pollution (no change).

15. Visual Resources

- The effects of new actions on visual resources will continue to be considered with a focus on minimizing degradation of scenic views (no change).

16. Wildfire Management

- A range-wide fire management plan will be prepared to establish fire prevention and suppression protocols to minimize threats to human life, property, and natural and cultural resources (new action).

17. Perimeter Land Use, Encroachment, and Regional Planning

- Actions will be taken to improve coordination and communication with off-range managers and authorities to address issues of a regional concern and to provide input so that off-range actions result in few, if any, adverse effects on the BMGR (new action).

STATUS OF THE SPECIES

Sonoran Pronghorn

Our August 6, 2003, biological opinions on MCAS-Yuma's Arizona portion of the Yuma Training Range Complex (YTRC) – BMGR-West (02-21-95-F-0114R4), and Luke Air Force Base's military activities on the BMGR-East (02-21-96-F-0094R2) included a detailed Status of the Species for the Sonoran pronghorn. Herein we incorporate that status discussion by reference and update only information that has changed.

C. Habitat
Fire

The winter and spring of 2004/2005 was 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. Historically, native Sonoran Desert annuals probably only rarely formed

continuous stands of fine fuels (Humphrey 1974). In addition, native annuals tend to deteriorate rapidly and, by the onset of the monsoon season when lightning becomes an ignition source, the fuels typically are unlikely to carry fire very far. In years with ample winter precipitation, introduced annuals, such as Mediterranean grass (*Schismus arabicus*), Sahara mustard (*Brassica tournefortii*), and garden rocket (*Eruca vesicaria*) tend to form continuous, relatively persistent stands of fine fuels. 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 illegal immigrants or smugglers, provided the ignition sources. Exact numbers are unknown; however, in 2005 roughly 5,000 acres of Sonoran pronghorn habitat has burned to date on the Cabeza Prieta NWR. As of May 25, an estimated 13,000 acres had burned on BMGR-East. However, during the week of June 20, a fire started on BMGR-East that, according to news reports, burned more than 50,000 acres of Sonoran Desert scrub. How much of that was in current pronghorn habitat is unknown, however; much of the desert scrub between the Crater Range and the Sauceda Mountains burned in the fire.

Most Sonoran Desert trees, shrubs, and cacti are poorly adapted to fire. On the Tonto National Forest, the Siphon Fire along the Bush Highway heavily impacted saguaros (*Carnegia gigantea*) and foothill palo verde (*P. microphyllum*), and reduced white ratany (*Krameria grayi*), wolfberry (*Lycium* sp.), and creosote (*Larrea tridentata*). Twenty-one years after the fire some native species, such as purple three-awn (*Aristida purpurea*) and desert senna (*Cassia armada*) had increased. Foothill palo verde had also apparently recovered with respect to density and canopy cover (Alford and Brock 2002).

Most cacti are very fire intolerant; fires at Saguaro National Park resulted in greater than 20 percent mortality of mature saguaros (Schwalbe *et al.* 2000). Near Palm Springs, California, fires during 1976-1983 resulted in replacement of creosote, white bursage (*Ambrosia dumosa*), and cholla (*Opuntia* sp.) with brittlebush (*Encelia farinosa*) and both native and introduced annual plants (Brown and Minnich 1986). In central Arizona, we have noted loss of cacti, trees, and creosote, and replacement by brittlebush and regrowth of jojoba (*Simmondsia chinensis*) and catclaw acacia (*Acacia greggii*) after fires.

Burning of creosote flats may have little initial effect on pronghorn, and could benefit them in the short term by increasing visibility. However, fire in the washes could eliminate important forage species and thermal cover. Some areas burned in 2005 experienced nearly complete removal of vegetation cover. Those areas will provide no components of pronghorn habitat until annual or perennial vegetation recovers. As noted in the 2003 opinions, during drought years cacti are a major dietary component (44 percent, Hughes and Smith 1990). Consumption of cacti, especially chain fruit cholla (*Cylindropuntia fulgida*), provides an important source of water during hot, dry conditions (Hervert *et al.* 1997). Cholla are readily killed by fire.

The extent and longevity of effects to pronghorn habitat from this year's fires are not yet clear, and the fire season is not yet over. Monitoring will be needed to determine survivorship and recovery of important forage and cover species, and if current fires promote establishment of introduced plants that further increase fire risk. However, even in the best scenario it is likely to

be many years before trees once again dominate wash communities and cholla recover to a point that they are useful forage plants for pronghorn.

D. Distribution and Abundance
United States

Populations of Sonoran pronghorn have increased dramatically since the August 6, 2003, opinions. As described in those opinions, a devastating drought and other factors caused an estimated 79 percent decline in the U.S. subpopulation from 2000 to 2002. Since then, several key recovery actions have been implemented, including establishment of forage enhancement plots, construction of a semi-captive breeding facility, stocking of the breeding facility with pronghorn from Sonora and Arizona, and construction of pronghorn waters. In addition, precipitation in 2003-2005 was adequate for production of ample forage and excellent fawn survivorship. The estimated U.S. population increased from 21 pronghorn in December 2002 to 58 in December 2004. An additional seven adults and 10 fawns populate the semi-captive breeding facility.

Mexico

The status of the two subpopulations in Sonora (west of Highway 8 near the Pinacate Lava flow, and southeast of Highway 8) has improved since 2002, similar to the U.S. subpopulation. Surveys conducted in December 2004 and February 2005 demonstrated that the population southeast of Highway 8 increased from an estimated 260 to 625, while the Pinacate population increased from an estimated 25 to 59.

E. Threats
Barriers that Limit Distribution and Movement

Since the 2003 BOs, a welded steel vehicle barrier has been constructed along the Organ Pipe Cactus National Monument boundary from the Tohono O'odham Nation boundary to nearly Quitobaquito. The barrier will be extended to the boundary with Cabeza Prieta NWR. At the same time, theft has resulted in the disappearance of the barbed wire cattle fence along the international boundary at Organ Pipe. The vehicle barrier is not likely a significant barrier to movement of pronghorn, and removal of the barbed wire fence could facilitate movement of pronghorn between Sonora and Arizona. However, Mexico Highway 2, which runs east-west and parallels the border, is probably key in preventing such movements.

Habitat Disturbance

The 2003 opinions describe ongoing grazing and effects to pronghorn on the BLM allotments near Ajo. In 2004, the Cameron Allotment was closed, cattle were removed, most boundary fences with Cabeza Prieta NWR and Organ Pipe Cactus NM as well as pasture fences were taken down, but waters were left in place for pronghorn and other wildlife. We expect that vegetation communities and soils will gradually recover and pronghorn will make more use of the area in the future.

Illegal immigration and smuggling, as well as associated law enforcement response by Border Patrol and others, have continued to increase since 2003. We do not have precise numbers, but proliferation of illegal vehicle routes, presence of vehicles and people in pronghorn habitat, and, as discussed above, fires caused by illegal immigrants or smugglers continue to cause significant adverse effects to pronghorn and their habitat. There have been at least two cases of illegal immigrants on foot going over or under the fence and walking through the semi-captive breeding facility. Law enforcement helicopters have more than once passed at low elevations over the pronghorn facility, which could result in animals bolting and potentially injuring themselves (but that has not occurred to date). Based on discussions with land managers and at meetings of the Barry M. Goldwater Executive Council (BEC), there is evidence that increased law enforcement is pushing illegal traffic west into the Yuma Desert (out of pronghorn habitat) and possibly east, as well. The vehicle barrier at Organ Pipe Cactus NM is likely pushing vehicle traffic (but not foot traffic) onto Cabeza Prieta NWR and the Tohono O'odham Nation.

ENVIRONMENTAL BASELINE

Sonoran pronghorn

The Environmental Baseline from the 2003 opinions is included here by reference. The following information supplements and updates that baseline.

Distribution

Because none of the pronghorn are telemetered, we know very little of current pronghorn habitat use or distribution in Arizona. The older, more experienced does are thought to guide herds to traditional-use seasonal areas. The death of most of these older individuals in 2002 may have changed use patterns. During the December 6-12, 2004, survey of the Arizona population, two groups of pronghorn were seen on BMGR-East, one group was observed on BMGR-West, and four groups were found on the Cabeza Prieta NWR. Early this year, pronghorn were using the tactical ranges at BMGR-East, but since March few have been observed there. Pronghorn were recently observed in Charlie Bell Pass in the Growler Mountains (June), on the Granite Mountains forage enhancement plot (May), and in the Pozo Nuevo Hills at Organ Pipe Cactus NM (May).

Drought

As discussed above, since the drought of 2002, both winter and summer precipitation has been adequate to provide good to excellent forage conditions for Sonoran pronghorn.

Emergency Recovery Actions

We and our partners continue working to implement a variety of recovery actions in Arizona. Five forage enhancement plots are now in operation. Our 2003 opinions described the construction of the semi-captive breeding facility in Childs Valley. That facility is now completed, one of the forage enhancement plots is located within the enclosure, and 17 pronghorn populate the facility. Two of the does in the enclosure were captured from the

Sonoran population southeast of Highway 8, and four does and one buck were captured and placed in the enclosure from the Arizona population. This spring, the does gave birth to 10 fawns.

The Charlie Bell and recently-completed Adobe Well forage enhancement plots were irrigated in the last two months. The Granite Mountains forage site on BMGR was irrigated twice for several days recently. Several free flowing valves were installed in order to enhance vegetation in the washes. A drinker was filled and a surveillance camera installed at the Granite Mountains site. While irrigating there on May 19, monitors observed three pronghorn (two adult females and one fawn) on the plot. The Lower Well forage enhancement plot is now completed and a trial irrigation has taken place. Personnel pumped water from the well to the storage tanks, and then pumped from the storage tanks to the plots. We estimate the well produces ~ 20 gallons/minute sustained.

This year water developments in the Granite Mountains, Sierra Pintas, Fawn Hills, and Antelope Hills were modified to expand water storage capabilities. Work is underway to establish two new pronghorn waters on BMGR-West. Additional water developments have been established or improved since 2003.

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

See the discussion above under "Habitat Disturbance" in the STATUS OF THE SPECIES regarding increasing illegal immigration and smuggling, and effects to pronghorn and their habitats.

E. Past and Ongoing Federal Actions in the Action Area

Since our August 2003 BO, we have consulted formally on six occasions. All were non-jeopardy reinitiations of consultation in which we anticipated no incidental take of pronghorn. They are summarized here:

December 22, 2003: Reinitiation of formal consultation with Organ Pipe Cactus NM regarding effects of the vehicle barrier on their southern border (02-21-F-0237R). We concluded that the proposed revised construction schedule would result in effects similar to those of the original proposal.

January 27, 2004: Reinitiation of formal consultation with Organ Pipe Cactus NM regarding effects of revised proposed actions for the State Route 85 Roadway and Drainage Improvements Project (02-21-02-F-0546R1), the Widening of North Puerto Blanco Road Project (02-21-01-F-0109R1), and the Twin Peaks Access Road Stabilization Project (02-00-F-0295R1). Revisions to the construction schedules for all three projects were proposed that would take construction up to March 15, 2004, which is the beginning of the critical fawning period. We anticipated that the revisions would add only minor effects to the pronghorn.

April 29, 2004: Second reinitiation of formal consultation with Organ Pipe Cactus NM regarding effects of the vehicle barrier (02-21-F-0237R2). Increased vehicle traffic was

proposed as part of the construction activities. We anticipated no additional effects to pronghorn.

June 21, 2004: Reinitiation of formal consultation regarding the effects of livestock grazing on BLM lands in the Ajo area (02-21-94-F-192R3, 02-21-85-F-069R1). BLM proposed closure of the Cameron Allotment. We concluded that net effects of closing the allotment would be beneficial to the pronghorn.

March 3, 2005: Reinitiation of formal consultation regarding effects of livestock grazing on BLM lands in the Ajo area (02-21-94-F-192R4, 02-21-05-F-0120). BLM proposed to increase authorized use on the Coyote Flats and Why allotments, to combine these two allotments into one (Coyote Flats), and to make changes in seasonal use and other minor modifications to the livestock grazing activities. We found that these revisions would have effects to pronghorn similar to those of previous grazing regimes.

March 10, 2005: Reinitiation of formal consultation with Organ Pipe Cactus NM regarding effects of revised public use restrictions for the Widening of North Puerto Blanco Road Project (02-21-01-F-0109R2) and their General Management Plan (02-21-89-F-0078R3). Public use restrictions were revised from the March 15-July 15 period to April 30-July 15 for 2005 and other years with good precipitation and pronghorn forage, as suggested by the Sonoran Pronghorn Recovery Team. We found that this revision would have little additional effect to pronghorn or their habitat.

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.

Implementation of the following resource management elements proposed in the INRMP may result in degradation of pronghorn habitat and/or disturbance to pronghorn.: Resource Inventory and Monitoring; Motorized Access and Unroaded Area Management; Camping and Visitor Stay Limits; Recreation Services and Use Supervision; Rockhounding; Wood Cutting, Gathering, and Firewood Use and Collection of Native Plants; Hunting; Recreational (Target) Shooting; Utility/Transportation Corridors; General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters; Special Status Species; and Wildfire Management.

Disturbance to pronghorn and degradation of pronghorn habitat could result from vehicular and foot traffic; noise; trash dispersal; light pollution; disturbance of soils; and crushing, destruction, or removal of vegetation that may provide forage and cover to pronghorn, associated with activities detailed in the resource management elements. Additionally, though it has not been documented for Sonoran pronghorn, there is a potential for pronghorn to be killed or injured

through collision with vehicles. Though the INRMP would authorize activities that may be detrimental to pronghorn, restrictions, prohibitions, and provisions included in the resource management elements should generally reduce disturbance to pronghorn and degradation of their habitat. Overall, implementation of the INRMP and the resource management elements will likely be beneficial to pronghorn on the BMGR.

The 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, pronghorn ran from the observer's vehicle and continued to run until they were out of sight.

Studies of captive pronghorn, other than the Sonoran subspecies, have also 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. Other investigators have shown that heart rate increases in response to auditory or visual disturbance in the absence of overt behavioral changes (Thompson *et al.* 1968, Cherkovich and Tatoyan 1973, Moen *et al.* 1978).

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 stresses 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.

Recreation is recognized as having significant environmental impacts on wildlife (Knight and Gutzwiller 1995). Non-motorized human recreation activities, such as hiking, have the ability to disrupt wildlife in many ways, particularly by displacing animals (Knight and Gutzwiller 1995). McArthur *et al.* (1982) reported elevated heart rates and flight among mountain sheep approached by humans. Mountain sheep reactions to hikers were greater than reactions to road traffic, helicopters, or fixed wing aircraft. Peak levels of hiking and skiing displaced chamois from nutritionally important habitats for prolonged periods (Hamr 1988). Orienteering activities in Denmark displaced roe and red deer from their home ranges; however, the animals eventually returned to these areas after disturbances ceased (Jeppesen 1987a, 1987b). Cassier *et al.* (1992) found that elk in Yellowstone National Park moved an average of 1.1 mile to avoid cross country skiers, often moving to another drainage.

Resource Management Elements

Implementation of the "Resource Inventory and Monitoring" resource management element may result in increased disturbance to pronghorn. Disturbance could be avoided or minimized by adjusting surveys to avoid areas occupied by pronghorn. Overall, implementation of this element will likely benefit pronghorn by potentially providing better information about pronghorn and pronghorn habitat on the BMGR and the elements important to their protection and preservation. In addition to implementing a system that sets limits of acceptable change and uses adaptive management, this element recommends development of a monitoring system that integrates with existing monitoring and management activities within the greater Sonoran Desert Ecoregion. This would allow for management of pronghorn in a landscape context, and provide a better basis for coordinating management with lands adjacent to the BMGR. Additionally, if the proposed inventory and monitoring program is successful in identifying where detrimental impacts to pronghorn and pronghorn habitat are occurring and effective adaptive management responses are developed and implemented, there could be beneficial effects to pronghorn and pronghorn habitat.

Implementation of the "Motorized Access and Unroaded Area Management" resource management element will result in adverse effects to pronghorn. Continued use of roads proposed to remain open to public use within pronghorn habitat will result in continued disturbance to pronghorn and degradation of their habitat. Road closures within pronghorn habitat associated with this element, however, will likely benefit pronghorn.

Roads have been documented to generally affect wildlife and habitat in a number of ways, including the fragmentation and degradation of habitat, and direct mortality from impacts with vehicles. Human use of roads can cause disturbance to pronghorn as described above. According to the FEIS, the subject BMGR dirt roads, most of which are unimproved, have a lower magnitude of impact than paved roads with high traffic volumes. The FEIS states that the U.S. Border Patrol-maintained drag roads and roads providing access to the military ground operational areas are the best example of the types of BMGR roads that would have the highest degree of impact on wildlife and wildlife habitats. However, none of these roads are proposed for closure. The roads proposed for closure are, for the most part, roads that were created through repeated use rather than through mechanical dirt-moving, and are relatively narrow and

infrequently used. Even these roads, however, can cause direct, permanent disturbance of the habitat, cause erosion that can reduce the quality of habitat, and facilitate invasion by non-native pest plant species that can displace native habitat through competition or fire. Human use of roads can result in short-term denial of access to habitat for pronghorn or cause pronghorn to flee the area when cars or people approach.

It is estimated that 41 percent of the current pronghorn range occurs on the BMGR, with 2 percent occurring in Management Unit 2, 11 percent occurring in Management Unit 3, 13 percent occurring in Management Unit 4, and 15 percent occurring in Management Unit 5. About 32 percent of the current pronghorn range within the BMGR is in areas that are generally open to public access (that portion within Units 2 and 3 and the road open to the public in Unit 4); the remainder is within areas that are closed to public access. Additionally, beginning in 2002, Unit 3 is closed to public entry from March 15 to July 15 each year as part of the overall effort to recover the pronghorn. This timeframe spans the normal period for pronghorn births and is critical to the early survival of fawns.

The INRMP proposes to close an estimated 112 miles of road within the current pronghorn range. These road closures represent a 17 percent reduction of disturbance from roads within the current distribution of pronghorn in the BMGR (the total road mileage would be reduced from about 650 miles to about 538 miles). Most of the roads slated for closure are used relatively infrequently and are not regularly maintained. These types of roads are not likely to inhibit the movement of pronghorn, however, pronghorn using areas along these roads are likely to be startled and may move considerable distances, at least temporarily, to avoid vehicles.

The closure of roads within the pronghorn habitat would likely be beneficial because it would reduce encounters between humans and pronghorn, and it would help protect the habitat from any associated disturbance. Most of the proposed road closures within pronghorn range would be within creosote-dominated vegetation communities, which pronghorn use for forage, particularly during the spring. Some proposed road closures within pronghorn range occur within the bajadas of the Mohawk Mountains, which are particularly used by females during the fawning season.

The entirety of the valley bottom floodplain natural community on the BMGR is within the current distribution of pronghorn. The relatively dense vegetation found within the desert riparian vegetation community provides forage, shade, and cover for pronghorn. About 8 miles of roads would be closed within this community, which represents a reduction of about one half. Approximately 6 miles of roads in the xeroriparian scrub, which occurs with relative frequency in the current range of pronghorn, would be closed. This habitat provides important thermal cover for pronghorn, particularly during the hot, dry summer months. It is estimated that 19 unroaded areas greater than 3,000 acres in size would be within the current area of distribution of the pronghorn, which would also contribute to the protection of pronghorn because the maintenance and conservation of large tracts of undisturbed habitat would reduce disturbance on this species.

Implementation of the "Camping and Visitor Stay Limits" will likely result in disturbance to pronghorn and degradation of pronghorn habitat. Vehicular and foot traffic, trash dispersal,

noise, and light pollution associated with camping could affect behavior and movement patterns of pronghorn and degrade habitat. Proposed camping limitations and restrictions (e.g., restriction of camping within ¼-mile of wildlife water sources and of designated natural and cultural resources that are sensitive to human-caused disturbance; closure of some road segments and specific areas to protect resources that are sensitive to human-induced disturbances), however, will likely benefit pronghorn by reducing the area affected by camping and by continuing to limit the duration of any disturbance to pronghorn that may be caused by vehicles and associated camping activity. Additionally, pronghorn will continue to benefit from the closure of Unit 3 to the public during the fawning season.

Implementation of the "Recreation Services and Use Supervision" resource management element will result in continued disturbance to pronghorn and degradation of their habitat similar to the camping element described above. Limitations and provisions associated with this element, however, will likely benefit pronghorn. Continued prohibition of public off-road vehicle travel, on- and off-road racing, and motorized public travel in washes, except where they are a designated as part of the road system open to the public and are dry, will decrease disturbance of pronghorn and degradation of their habitat. Requiring a special use permit for larger group sizes (single parties with 10 or more vehicles) in all the management units except Unit 2 could benefit pronghorn and pronghorn habitat by discouraging use by larger groups.

Law enforcement activities may result in disturbance to pronghorn if activities (e.g., walking, driving) occur within occupied pronghorn habitat. However, requiring the retention of at least six law enforcement officers would continue to ensure that there would be personnel to prevent/deter visitors from violating rules regarding protection of pronghorn and pronghorn habitat (e.g., more law-enforcement officers to prevent illegal ORV travel).

Developing and implementing a limits-of-acceptable-change monitoring program would guide recreation use and potentially allow for better protection of pronghorn by providing data on the effects of recreation use on pronghorn and pronghorn habitat. Increases in public education programs and assessment of the need for additional gates, fencing, or signs, which could deter motorized access in unauthorized areas, may benefit pronghorn.

Implementation of the "Rockhounding," "Wood Cutting, Gathering, and Firewood Use, and Collection of Native Plants," "Hunting," and "Recreational (Target Shooting)" resource management elements will likely result in disturbance to pronghorn and some habitat degradation due to vehicular and foot traffic and noise associated with these activities. Disturbance to pronghorn from the allowance of rockhounding should be minimized by restrictions on the amount of rock allowed to be removed (maximum of 25 pounds of rock per individual per trip and 250 pounds per individual per year) and by prohibiting rockhounding within special natural/interest areas and other designated areas where resources are sensitive to human-induced disturbances. The prohibition of rockhounding in other areas the BMGR should benefit pronghorn by reducing any potential disturbance to pronghorn or degradation of habitat.

Disturbance from the collection of dead and downed wood for campfires should be minimized through monitoring of this activity in high use areas and implementation of restrictions if resource conditions dictate the need. Though native plants may be collected for protected Native

American purposes, collection or salvage of plants listed in the Arizona Native Plant Law, including plant parts, seeds, or fruit; and wood cutting and wood gathering for purposes other than campfires, will be prohibited.

An assessment will be conducted to determine if it would be appropriate to establish a special hunting permit program that requires payment of a nominal fee to be used for the protection, conservation, and management of wildlife, including habitat improvement, on the range. Pronghorn on the BMGR could benefit from the special hunting permit program, if implemented, because it would potentially provide funding that would be used for general habitat protection, conservation, and management of wildlife, including habitat improvement and related activities.

An assessment will be conducted on the appropriateness of recreational shooting on the BMGR, as well as of the need to restrict such activities to specific areas, times, and types of firearms, should it be justified. This would potentially have minor benefits to pronghorn, if, as a result of the assessment, dispersed recreational shooting was disallowed in place of providing for recreational shooting in designated areas located away from areas of greater pronghorn use. Therefore, although allowing recreational shooting may have some adverse effects on pronghorn, these new management objectives may be expected to somewhat reduce and/or localize these impacts.

Though State Route (SR) 85 appears to already pose a barrier to eastward movement of pronghorn, allowing continued development of overhead and underground utilities within the SR 85 transportation/utility corridor ("Utility/Transportation Corridors" resource management element) will likely continue to negatively affect pronghorn. However, prohibiting all other transportation/utility corridor development, except within the SR 85 corridor, will likely benefit pronghorn by reducing/limiting the effects of development (i.e., elimination of wildlife habitat, increased wildlife mortality, increased noise and human activity, habitat fragmentation, and restriction of wildlife movement).

The development of a program to control all trespass grazing ("General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters" resource management element) will likely benefit pronghorn. Livestock grazing can alter vegetation and degrade habitat, compete with/act as a deterrent to use for forage by pronghorn, and transmit disease to pronghorn. Livestock grazing is also associated with the spread of invasive species, which can alter habitats and reach densities to carry fire. Control of invasive species could result in some disturbance to pronghorn if control activities are conducted in areas occupied by pronghorn. Control of invasive plants, however, will likely benefit pronghorn by improving habitat function and reducing the risk of large fires. The objectives to establish criteria for protection of important habitat; to implement restrictions in key areas to protect and conserve habitat; and to restore areas that have been damaged by a discontinued military, agency, or intensive public use would likely benefit pronghorn.

Up to six high-priority wildlife water development projects may be implemented. It is currently unknown whether the San Cristobal Valley site will be selected for a water development project; if it is, however, it may benefit pronghorn. The development will only be implemented in concert with supporting research, as consistent with the Sonoran Pronghorn Recovery Plan, and as evaluated through section 7 consultation (DOI, BLM 1999).

Disturbance to pronghorn could occur from implementation of the "Special Status Species" resource management element, if activities such as special status species surveys and habitat improvements, as well as predator control, occur within habitat occupied by pronghorn. However, these activities would generally benefit pronghorn if they are made in support of pronghorn recovery. Currently, there are no specific plans for implementing predator control programs on the BMGR. Predator control could potentially be a useful tool for furthering the recovery of pronghorn; however, the need for and design of any future predator control program would be resolved in detail by the recovery team, the FWS, and/or Arizona Game and Fish Department, and reviewed under the Act, National Environmental Policy Act, and other applicable laws.

Prevention of soil erosion, water pollution, and groundwater depletion; restriction of vehicular and construction activities when soils are susceptible to a heightened risk of erosion; restriction of vehicular traffic to established roads and previously impacted areas; and restoration of areas with excessive surface damage from past activities ("Soil and Water Resources" resource management element) will likely benefit pronghorn by preventing degradation and/or improving the quality of their habitat. A range-wide soil survey could benefit pronghorn by providing information about the relationship between wildlife habitats of interest and the soils on which they occur. Such information could aid in monitoring and adaptive management of pronghorn and pronghorn habitat.

The implementation of dust control measures at construction sites and recreation activity areas, and the development of best management practices for activities that might potentially generate non-point source pollution ("Air Resources" resource management element) may provide a small benefit to pronghorn habitat because these measures help protect vegetation (i.e., preventing the accumulation of excessive amounts of dust on leaves of vegetation, which can interfere with photosynthesis) that is a component of pronghorn habitat. Management provisions for visual resources ("Visual Resources" resource management element) that result in new development occurring in previously disturbed areas may benefit pronghorn and pronghorn habitat by minimizing habitat loss and helping to keep human disturbances within certain locations.

The preparation of a range-wildfire management plan to establish fire prevention and suppression protocols to minimize threats to human life, property, and natural and cultural resources ("Wildfire Management" resource management element) will likely benefit pronghorn because wildfires can have a detrimental impact on pronghorn by potentially causing direct mortality or by destroying pronghorn habitat. Some fire prevention and suppression activities could disturb pronghorn or degrade habitat (i.e., creation and maintenance of fuel breaks in pronghorn habitat), however, adverse effects could be minimized or avoided through proper planning and would be analyzed in future section 7 consultation.

Improved coordination and communication with off-range managers and authorities to address issues of a regional concern and to provide input so that off-range actions result in few, if any, adverse effects on the BMGR ("Perimeter Land Use, Encroachment, and Regional Planning" resource management element) will likely benefit pronghorn. Actions that consider species occurring both on and off the BMGR (e.g., pronghorn) in a greater regional context would lead

to better information about their ecology and also better management and decision-making. Assessment of issues such as groundwater management, soil or water quality, use of agricultural chemicals, trespass grazing, and illegal immigration would all be considered, and their effect on the cultural and natural resources (including pronghorn) of the BMGR would likely benefit pronghorn.

CUMULATIVE EFFECTS

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

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

Of particular concern are increasing illegal border crossings by undocumented migrants and smugglers. Deportable migrant apprehensions by Border Patrol agents in the Ajo Station increased steadily from 9,150 in 1996 to 20,340 in 2000. Apprehensions in the BMGR by the Border Patrol were 9,500, 11,202, and 8,704 in 1996, 2000, and 2001, respectively (URS Corporation 2003). In 2001, estimates of undocumented migrant traffic reached 1,000 per night in Organ Pipe Cactus NM alone (Organ Pipe Cactus NM 2001). Given these numbers and that the Border Patrol apprehends only a fraction of illegal migrants and smugglers, undocumented illegal traffic through the BMGR probably exceeds recreational use even on the busiest of holiday weekends. Increased presence of the Border Patrol in the Douglas, Arizona area, and in San Diego (Operation Gatekeeper) and southeastern California, have pushed undocumented migrant and smuggler traffic into remote desert areas, such as Cabeza Prieta NWR, Organ Pipe Cactus NM, and BMGR (Klein 2000). Vehicle barriers and effective patrols in the Algodones Dunes of Imperial County, California, are probably responsible for a recent redirection to and increase of illegal vehicle crossings and vehicle abandonment in the BMGR (May 21, 2003, meeting notes of the Barry M. Goldwater Range Executive Council). These illegal crossings and law enforcement response have resulted in route proliferation, off-highway vehicle (OHV) activity, increased human presence in backcountry areas, discarded trash, abandoned vehicles, cutting of firewood, illegal campfires, and increased chance of wildfire. Habitat degradation and

disturbance of pronghorn almost certainly results from these illegal activities. We expect these activities to continue; however, some discussions are occurring between Mexican and U.S. officials about the creation of a guest worker program whereby Mexican nationals could legally cross the border to work in the U.S. If such a program is initiated, it might greatly reduce future illegal immigration and law enforcement response, with concomitant reductions in habitat degradation and suspected disturbance of pronghorn.

CONCLUSION

After reviewing the current status of the Sonoran pronghorn, the environmental baseline for the action area, the effects of the proposed implementation of the BMGR INRMP, 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 rationales given in our previous biological opinions and reinitiations on those actions, and the following:

1) The Sonoran pronghorn population has increased since 2002 despite increasingly high levels of human use in the form of off- and on-road vehicle and foot travel by smugglers, illegal immigrants, and law enforcement.

2) Restrictions, prohibitions, and provisions described in the proposed resource management elements would reduce adverse effects of certain activities proposed by the INRMP. For example, an estimated 112 miles of road within the current pronghorn range would be closed; all transportation/utility corridor development would be prohibited outside of the SR 85 corridor; a wildfire management program would be developed; a program would be developed to control all trespass grazing; and additional resource surveys would be conducted that could provide better information about pronghorn and pronghorn habitat on the BMGR and the elements important to their protection and preservation.

3) Unit 3, mostly open to public use, will continue to be closed to public entry during the pronghorn fawning season from March 15 to July 15.

4) When added to the environmental baseline, the status of the species, and cumulative effects, the effects of the proposed action, which include beneficial restrictions, limitations, and provisions, do not reduce appreciably the likelihood of survival and recovery of the subspecies in the wild. Therefore, the proposed action will not jeopardize the continued existence of the subspecies. As proposed, implementation of the INRMP will not significantly adversely affect important fawn recruitment or significantly adversely affect occupied pronghorn habitat. Concerns about disturbance to pronghorn and habitat degradation are minimized by the INRMP's restrictions, limitations, and provisions.

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

INCIDENTAL TAKE STATEMENT

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

AMOUNT OR EXTENT OF TAKE ANTICIPATED

We do not anticipate the proposed action will result in incidental take of Sonoran pronghorn for the following reasons:

1) Restrictions, prohibitions, and provisions described in the proposed resource management elements would reduce adverse effects of certain activities proposed by the INRMP (see rationale 2 under "Conclusion" above).

2) Pronghorn are rare (currently <60) on the BMGR, making encounter with human activities a relatively rare event.

3) Recently completed forage enhancement plots and water developments buffer the effects of drought when pronghorn are most sensitive to human disturbance.

4) No incidental take of Sonoran pronghorn is known to have occurred on the BMGR or elsewhere in Arizona due to activities authorized by the INRMP.

CONSERVATION RECOMMENDATIONS

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

1. MCAS and LAFB should continue to pursue funding for all pronghorn research, monitoring, and recovery needs identified by the SOPH Recovery Team.

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

REINITIATION NOTICE

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

Thank you for your cooperation and assistance throughout this consultation process, as well as your considerable role and leadership in conservation of the Sonoran pronghorn. Any questions or comments should be directed to Erin Fernandez (520) 670-6150 (x238) or Jim Rorabaugh (602) 242-0210 (x 238).

Sincerely,

FEN

Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
(Attn: S. Rinkevich, S. Helfert)
Refuge Manager, Cabeza Prieta National Wildlife Refuge, Ajo, AZ
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Park Superintendent, Organ Pipe Cactus National Monument, Ajo, AZ
Regional Supervisor, Arizona Game and Fish Department, Yuma, AZ
Acting Chief, Habitat Branch, Arizona Game and Fish, Phoenix, AZ

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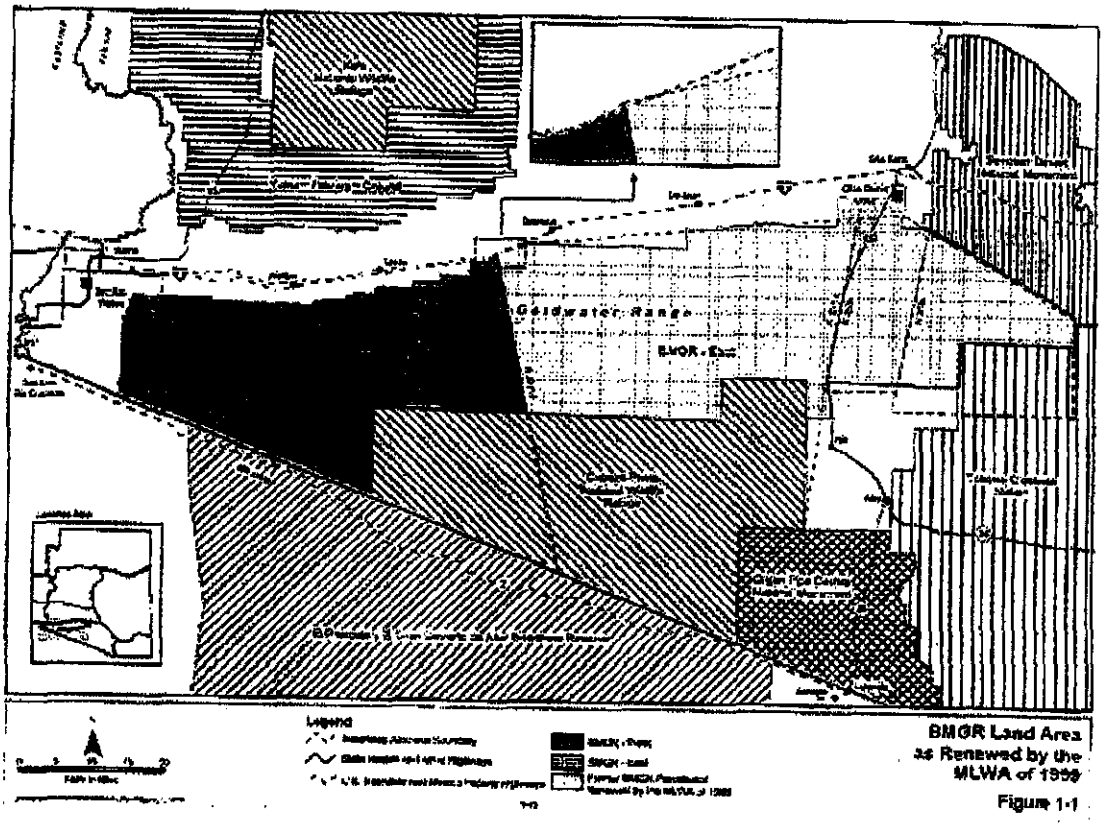
TABLES AND FIGURES

Figure 1. The Barry M. Goldwater Range (FEIS, May 2005).



APPENDIX G

STATE HISTORIC PRESERVATION OFFICE SECTION 106 CONSULTATION LETTER DATED MARCH 25, 2005

GC

"Managing and conserving natural, cultural, and recreational resources"

Arizona State Parks

March 25, 2005

James R. Uken
Director, 56th Range Management Office
7224 North 139th Drive
Luke AFB, AZ 85309-1420

ATTN: Carol Heathington, 56 RMO Historic Preservation Officer

Re: Review of Draft Programmatic Agreement (PA) for Implementation of an Integrated Natural Resources Management Plan (INRMP) for the Barry M. Goldwater Range (BMGR); MCAS and LAFB; SHPO-2003-0545(22822)

Dear Mr. Uken:

Thank you for providing our office with the revised draft of the PA (dated January 2005) for the above-referenced undertaking. We have reviewed this draft and find that it adequately addresses our comments provided to you on August 12, 2004. We agree that a programmatic agreement is the best approach to completing Section 106 review of INRMP implementation and agree with the approach taken in this latest draft. We are confident that this agreement can be successfully executed in the near future.

As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, please feel free to contact me at 602/542-7138, or e-mail me at ahoward@pr.state.az.us.

Sincerely,

Ann V. Howard

Ann Valdo Howard
Public Archaeology Programs Manager/Archaeologist
State Historic Preservation Office

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