

CHAPTER 3.0 CHANGES IN LAND AND ENVIRONMENTAL CONDITIONS SINCE THE PREVIOUS REPORT

When considered over the whole of the landscape in which the BMGR occurs, the approximate 1.7 million acres of land at BMGR continues to harbor a relatively unfragmented and undisturbed ecosystem that is recognized for the continuing predominance of natural processes and its rich biodiversity. The BMGR landscape is unfragmented in terms of both land use and management and, with the exception of State Route (SR) 85, is free of developed structures that may disrupt ecological connectivity across its entire span. The BMGR is central to a larger and principally unfragmented, contiguous land area that also includes the federally managed Cabeza Prieta NWR (860,010 acres) and the Organ Pipe Cactus (330,689 acres) and Sonoran Desert (487,000 acres) NMs, totaling over 3.4 million acres of federally managed unfragmented land. The BMGR is also connected to the Tohono O’odham Nation to the east, which contains about 2.7 million acres of mostly undeveloped land.

This chapter provides a brief overview of the environmental conditions and public recreation opportunities at the BMGR and an update as to how these conditions and opportunities may have changed since the 2007 INRMP was implemented. The topics addressed include:

- earth resources
- climate
- surface water
- vegetation and invasive plant species
- wildlife
- protected species
- cultural resources
- perimeter land use
- recreation and special uses

3.1 EARTH RESOURCES

3.1.1 Overview

The BMGR is located in the Basin and Range Physiographic Province of Arizona, which is distinguished by broad alluvial valleys separated by steep, discontinuous, northwest to southeast trending mountain ranges. The modern landscape of the BMGR is primarily the result of past mountain building activity and erosion from natural forces. Human activities have caused some accelerated erosion but, so far, such effects are locally isolated. Elevations range from less than 200 feet (61 meters) above mean sea level (MSL) to nearly 3,700 feet (1,128 meters) MSL. The lowest elevations on the range are



Mountain ranges and mixed cactus upland vegetation form dramatic visual landscapes.

found within its westernmost extent and rise to the Sand Tank Mountains, the BMGR's highest mountains in the easternmost portion of the range. All or portions of 15 named mountain ranges are found in the BMGR. The westernmost valley plains of the BMGR are within the Gran Desierto dune system, which extends both to the west and south of the BMGR and into Mexico. Smaller sand dune systems have also formed in several other range locations, with the Mohawk Sand Dunes in the central portion of the range being the most expansive.

The alluvial valleys of the BMGR are deep bedrock basins filled with silt, clay, sand, and gravel deposits. These deposits can be more than 10,000 feet (3,048 meters) deep. Along many of the mountain bases, sloping masses of alluvial fill material, known as bajadas, extend outward like fans to taper more gradually than the mountains themselves into the generally flat valley floors.

Extensive sheet-like lava flows occur in some parts of the range. These flows form irregular plains with rough basalt surfaces. Portions of the largest such lava flow in southern Arizona extend into the northern part of the range south of the community of Sentinel. The BMGR region is in a tectonically stable area with few earthquakes and few active faults.

3.1.2 Update

Ground disturbance is one of the key factors influencing soil stability and erosion. On a broad scale, the exclusion of certain surface disturbing activities (such as mining, grazing, off-road recreational driving, etc.) and the limited areas where military surface use occurs minimizes ground disturbance and the associated effects at the BMGR. Decisions implemented by the 2007 INRMP established a designated road system; closed the range to off-road driving except for approved military, resource management, and law enforcement purposes; and established vehicle operating rules. The roads have been posted or otherwise restricted to clearly identify the roads that are (1) open for administrative (i.e., government) and public use, (2) open only for administrative use, or (3) closed to all users. The intent of the road closures was to facilitate natural revegetation and recovery of ground surfaces. Public access to the range is by permit only and all permitted users are provided with current maps that show the roads and areas that are restricted for administrative use, and roads that are open for public use. The extent to which roads closed by the 2007 INRMP have re-vegetated has not been tracked, but some closed road segments have been observed to have re-vegetated to the point that they are no longer vulnerable to accelerated erosion.

Although designation of the BMGR road system in 2007 provided an important tool for the control and management of roads and vehicle use, off-road driving and the proliferation of new vehicle routes have been the most notable cause of new ground disturbance at the BMGR over the past five years. This problem resulted from an unanticipated sharp increase in vehicle traffic from UDIs and drug smugglers crossing the international border from Mexico and traveling cross-country through Organ Pipe Cactus NM, Cabeza Prieta NWR, BMGR, and/or the Tohono O'odham Nation. The volume of illegal vehicle traffic crossing the international border peaked during the last five years but has been significantly reduced since the completion of a border barrier fence from San Luis, Arizona, to the eastern side of Organ Pipe Cactus NM. Currently, the proliferation of new vehicle routes within the



Inappropriate use and management of roads through the BMGR can result in accelerated erosion and affect surface flows.

BMGR by illegal cross-border traffic is minimal; however, off-road vehicle driving by the Border Patrol to make apprehensions or perform rescue operations continues to be a source of ground disturbance.

3.1.2.1 BMGR West

BMGR West shares about 38 miles of boundary with Mexico. To construct the border barrier fence in the eastern part of BMGR West and the western part of the Cabeza Prieta NWR, numerous semi- and other heavy trucks hauling equipment, materials, and supplies accessed the boundary by traveling from Interstate 8 through BMGR West. The segment of El Camino del Diablo in BMGR West had to be substantially graded, widened, and straightened to support this construction access requirement. Frequent regrading was necessary to keep this earth-surfaced road in a condition to bear the weight of the truck traffic. As a result of repeated grading, the roadbed is now below grade along much of its length and sizable berms have developed along the road sides. Consequently, the road interrupts, impedes, and diverts surface drainage from the many wash channels that it traverses.

Despite the decline in UDI traffic, BMGR West continues to experience an increase in cross-country vehicle trails cut by Border Patrol agents during the pursuit and apprehension of UDIs. The Border Patrol also continues to maintain existing drag roads, has established some new drag roads, and has expanded its network of rescue beacons since 2007. A drag road is a surveillance feature that is created by dragging several bolted-together tires over a dirt road or well-used trail to erase old footprints and vehicle tracks and provide a fresh surface in which evidence of recent (since the last dragging) illegal crossings by people or vehicles is readily apparent. Dragging these roads repeatedly has also contributed to the formation of berms that affect surface water flows following precipitation events. The dirt shoulder adjacent to the paved road to Auxiliary Field II (AUX-II) has been widened considerably from dragging, which has diverted rainfall runoff and created new drainage channels. Rescue beacons are solar powered radio call boxes that allow UDIs or other individuals to signal for help when they are lost or endangered by exposure or other environmental hazards. The Border Patrol periodically smoothes out the area around the rescue beacons to monitor for recent foot traffic. These drag areas were originally intended to be minimal in size, but have been steadily enlarged over time. As discussed in Section 2.5.2, in February 2012, Organ Pipe Cactus NM and the Border Patrol signed a Memorandum of Understanding (MOU) regarding the repair and maintenance of roads within the monument. In the spring of 2012, MCAS Yuma and the Border Patrol initiated meetings to develop a similar MOU regarding the repair and maintenance of roads within BMGR West.

The use of OHVs, sand rails, other recreational vehicles, and unauthorized travel off the public road system contributes to ground disturbance that can lead to soil erosion. Excessive speeds and caravanning continually over the same route has added to road degradation. These high use areas require more frequent repairs, which involves dragging and grading, especially during the winter months when there is a higher volume of traffic. In 2007, the Federal Highway Administration approved the environmental documentation for construction of the Yuma Area Service Highway (SR 195) and construction was completed in 2009. The highway alignment passes through the westernmost part of BMGR West and required approximately 296 acres within the range for new right of way. The highway is a four-lane, divided highway that is paved, which helps to control erosion. However, the areas disturbed for construction have some vulnerability to erosion until re-vegetation and other reclamation strategies become fully established.

MCAS Yuma has requested funding to conduct an erosion study and map soils within BMGR West. The Marine Corps is also exploring methods of partnering with outside funding sources to research natural resource issues.

3.1.2.2 BMGR East

During the last five years, BMGR East also experienced an increase followed by a decline in UDI and smuggler traffic and a resulting proliferation of cross-country vehicle routes. The Border Patrol response has created some new cross-country vehicle routes as well as the creation of a number of new drag roads. A drag road east of Arizona SR 85 near the “temporary” Border Patrol checkpoint on that highway is an example of new drag road disturbance within BMGR East.

3.2 CLIMATE

3.2.1 Overview

Average annual rainfall in the higher elevations of the easternmost portion of the BMGR may approach 9 inches. Average rainfall over the entire range, however, is less than 5 inches per year. Rainfall in the western extremes of the range averages no more than 3 inches annually. These averages are based on long-term weather patterns, and no location within the Sonoran Desert is assured of receiving a given level of rainfall during any season.

Annual rainfall within this desert is highly variable in terms of its amount, seasonal timing, and geographic distribution. Most of the annual precipitation typically occurs during mid-winter from frontal types of storms or during a late summer monsoon-type of rainfall period. Because of the irregularity of rainfall patterns, some range locations may receive little or no rain during the same year in which other areas receive average or above-average precipitation.



Weather stations provide climatic data used to make management decisions.

The Sonoran Desert is subject to frequent and sometimes prolonged droughts that can limit some areas or broad regions to a little or no rainfall for one or more years. As a result, some of BMGR’s interior valleys receive an annual average of only 0.5 inch of rain per year. When the stable weather patterns that enforce the aridity of the BMGR region periodically break down, all or portions of the range may receive two to three times the normal annual rainfall, sometimes in only one or a few storms.

The overall effects of the prevailing low rainfall patterns are exacerbated by high temperatures and regional evaporation potentials that greatly exceed all known rainfall regimes. Summer daytime temperatures on the range often are in excess of 110° Fahrenheit and annual evaporation potentials, which vary from greater than 86 inches in the western part of the range to about 72 inches in the eastern, greatly exceed the available precipitation.

3.2.2 Update

Climatic conditions tend to be persistent, but as noted, rainfall patterns are highly irregular. The Southwest has experienced persistent and reoccurring drought for more than a decade, and some climate

models predict continued drought as a result of global climatic change (Seager et al. 2007 in Villarreal, Miguel L., et al., 2011). Increased temperatures and variable precipitation events related to drought and climate change could affect the BMGR by decreasing soil moisture, increasing drought stress in vegetation and wildlife, and decreasing the availability of surface-water resources.

3.3 SURFACE WATER

3.3.1 Overview

Surface water at the BMGR is very limited. There are no perennial or intermittent streams present on the range and ephemeral stream flow occurs only in immediate response to sizable rainfall events. Surface water drainage on the BMGR is outward from the mountain ranges and, for most of the area, ultimately northward by numerous feeder washes into the larger washes that flow to the Gila River, which in turn flows west into the Colorado River. Some storms cause flash flooding in the smaller mountain drainages and short-term flooding in the larger valley washes and floodplains.



Some natural and human-made catchments on the range hold water on a near year-round basis, as depicted here at the tinaja at Bender Spring.

Natural flooding events are highly variable in frequency and intensity and can have a large effect on natural community composition, structure, and function. Some rain water collects in natural rock catchments (also known as tanks or tinajas), human-modified natural catchments, or artificially constructed tanks where the water may persist for weeks or months without recharge until it eventually evaporates or is consumed by wildlife.

3.3.2 Update

At the BMGR-wide scale, surface water conditions have generally not changed substantially over the last five years, although drag-road road developments and the proliferation of cross-country vehicle routes have impacted natural surface drainage at localized scales in many locations. Modifications to El Camino del Diablo during the construction of the border barrier fence has likely had a more substantial effect that impacts a larger region of BMGR West than the local road corridor.

3.3.2.1 *BMGR West*

Soil compaction, erosion, and damage to native vegetation resulting from off-road driving can modify the distribution and pattern of overland flow during rain events, reducing available soil moisture for vegetation and causing further erosion by reducing soil cohesion (Brooks and Lair 2009). In addition, soil erosion may directly impact USMC training activities; instances of high wind speeds in areas where heavy soil erosion has occurred can reduce visibility during training activities as well decrease air quality. Soil erosion and air quality may also negatively affect the health of threatened and endangered species on the range, particularly the desert tortoise, which has experienced population decline due to an airborne respiratory virus responsible for the upper respiratory tract disease. While qualitative observations of anthropogenic impacts to soil resources have been noted by range management, there has been no quantitative, data-driven study documenting human and natural impacts to range soil resources, hydrology, overland flow, and air quality.

In the past decade, roads and increasing motor traffic have disturbed the naturally formed desert pavement and has resulted in substantial watershed erosions. Currently, many roads are intercepting the natural ephemeral washes, and serve as man-made drainage channels for the watershed (see the photos below). Because of steep slope and frequent motorized vehicles, many roads surfaces are severely incised. Those incised roads separate the lower and upper portions of the watershed, and disconnect the lower watershed from receiving water flow from the upper watershed. At present, the lower and upper watersheds have distinct vegetation covers as woody riparian vegetation types are disappearing in the lower watershed. The incised roads have also caused headcuts extending to the upper watershed.

Road Influence on Soil Erosion



Drag road operations create berms along the road sides that interrupt and divert overland flows. A number of drag roads in BMGR West exhibit the effects of this phenomenon. In places where roads have been repeatedly drug, the road beds have receded below grade and become small washes during storm events as runoff is captured from multiple natural drainages that are traversed by the road. Drag road berms also act to dam surface runoff in a number of BMGR West locations, which cause runoff from small and moderate storms to pond on the upstream side of the road. As a result, thick stands of vegetation develop in response to the increase soil moisture on the upstream side of the road and the natural vegetation community declines for some distance on the drier downstream side of the road. The dirt shoulder of the paved road to AUX-II, which has been widened considerably and converted into a drag road, now exhibits altered drainage patterns. As already noted in Section 3.1.2.1, the extensive grading modifications of El Camino del Diablo have substantially changed surface water drainage patterns along considerable lengths of this road. The full scope of effects of this recent activity on surface drainage has not yet been determined. Similarly, the consequence of the numerous cross-country vehicle routes that have been created over the last five-years as a result of illegal cross-border traffic and law enforcement reactions have not been assessed. In some heavily-used traffic corridors, which are affected by multiple

vehicle trails, drainage impacts may be concentrated, but localized effects on surface drainage from cross-country vehicle use are scattered in many locations of BMGR West.

3.3.2.2 *BMGR East*

During the last five years, surface water drainage at BMGR East has been affected by the development of new drag roads. Surface water drainage impacts in BMGR East from cross-country vehicle routes are likely to be similar to the effects exhibited in BMGR West.

3.4 VEGETATION AND INVASIVE PLANT SPECIES

3.4.1 Overview

Nearly 290 species of plants characteristic of the Arizona Upland and Lower Colorado River Valley subdivisions of the Sonoran Desert are reported to occur at the BMGR. The Arizona Upland Subdivision is restricted principally to the portions of the range east of SR 85 where the slopes and upper bajadas of the Sand Tank and Saucedo mountains provide favorable soils and elevations, and where an adequate precipitation regime prevails. The plant communities within the remaining portion of the range are within the Lower Colorado River Valley Subdivision. The distribution of plant communities within both of these subdivisions is influenced by the diverse landscape of the range, in which the series of widely spaced rugged mountain ranges, broad valley plains, sand dune systems, surface water drainages, and playas are the most important features.



The landscape of the range is an exceptional resource because its vast area has been relatively unaffected.

As a part of the 2007 INRMP planning process, The Nature Conservancy reviewed the ecological structure, composition, and processes on the BMGR and identified 13 natural community elements. Nine of these 13 natural communities and their estimated areas, based on the best available geographic information system (GIS) information, within the BMGR are as follows:

- Valley Bottom Floodplain Complex—29,000 acres (11,736 hectares)
- Dune Complex and Dune Endemics —30,000 acres (12,141 hectares)
- Creosotebush-Bursage Desertscrub—1,360,000 acres (550,372 hectares)
- Creosotebush-Big Galleta Scrub—24,000 acres (9,912 hectares)
- Paloverde-Mixed Cacti-Mixed Scrub on Bajadas—191,000 acres (77,295 hectares)
- Paloverde-Mixed Cacti-Mixed Scrub on Rocky Slopes—63,000 acres (25,495 hectares)
- Sand Tank Mountains Uplands —10,000 acres (4,047 hectares)
- Elephant Tree-Limberbush on Xeric Rocky Slopes—91,000 acres (36,826 hectares)
- Desert Playa—170 acres (69 hectares)

Two xeroriparian communities are associated with washes. The extent of these communities is best described in the following linear terms:

- Valley Xeroriparian Scrub—2,325 linear miles (3,742 kilometers)
- Mountain Xeroriparian Scrub—400 linear miles (644 kilometers)

Salt Desertscrub and Desert Tinajas/Springs are the twelfth and thirteenth communities. The area occupied by these communities is small and was not estimated as part of the 2007 assessment.

These 13 BMGR natural communities are described in terms of ecological characteristics (composition, structure, function/ecological process, physiographic occurrence, and associated soil characteristics) in Table 6 and their locations within the BMGR are illustrated in Figure 8. The xeroriparian communities align with the washes shown in Figure 8 and the isolated point data for Salt Desert Scrub communities east of the Copper Mountains and east of the Mohawk Mountains are not illustrated.

3.4.2 Update

In accordance with the management goals provided by the 2007 INRMP, inventory and monitoring plans have been developed for both BMGR West (Villarreal, Miguel L., et al., 2011) and BMGR East (56th Range Management Office, 2007). These plans adopt several protocols from existing regional monitoring programs, allowing for integration of BMGR West and BMGR East monitoring efforts, collaboration, and data sharing. As part of this effort, the range is being inventoried to collect data to verify or update the mapping for the 13 biotic communities identified in the 2007 INRMP. Vegetative mapping is partially completed, but inventory and mapping will continue over the next several years. The inventory and monitoring efforts are intended to establish quantifiable trends, which will require monitoring over multiple seasons of growth.

One of the issues associated with vegetation is the spread of exotic, invasive, or noxious plants. As defined in DoD Instruction 4715.3, exotic plants are “species that occur in a given place, area, or region as the result of direct or indirect, deliberate or accidental introduction of the species by human activity.” Executive Order 13112 requires federal agencies to identify actions that may affect invasive species; use relevant programs to prevent introduction of invasive species; detect, respond and control such species; monitor invasive species populations; provide for restoration of native species; conduct research on invasive species; and promote public education. An invasive species, as defined in Executive Order 13112, is “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”



Control of exotic, invasive, or noxious plants such as Sahara mustard is managed within BMGR East by physical removal of plants or the application of herbicide.

Exotic, invasive, or noxious plants are all generally characterized by their ability to colonize disturbed areas and their ease of dispersal. Their ability of invading undisturbed habitats differs between species, but invasive species have the potential to strongly impact native species. Roads, livestock grazing (current grazing near the BMGR perimeter and historic grazing within the BMGR), and people are the primary

vectors for invasive species on the BMGR. Because roads are an identified contributor to the spread of invasive plants, the proliferation of new roads and similar areas of disturbance are of particular concern. Seeds from invasive species can be caught in wheel wells or in tire tread when vehicles are driven through infested areas; these seeds may later fall in other areas, thereby further spreading the invasive colonies of the species. The 2007 INRMP reported that the density and distribution of non-native species on the BMGR was not accurately known, although BMGR East was estimated to have a comparatively greater distribution of invasive species than BMGR West because of higher annual rainfall amounts and closer proximity to vector sources for invasive species. As reported in 2007, the most widespread invasive plant of those recorded on the BMGR is the Sahara mustard (*Brassica tournefortii*), which is found in sandy soils throughout the BMGR. Buffelgrass (*Pennisetum ciliare*) was identified as a spreading species, particularly along the SR 85 corridor, in Area B, and south of the Crater Range (Whittle, 2012). In 2012, several dozen buffelgrass plants were discovered in the Gila Mountains along an OHV track in Fortuna Canyon along 1.2 miles of the canyon bottom within BMGR West. Other non-native grasses that have been identified include Lehmann lovegrass (*Eragrostis lehmanniana*), red brome (*Bromus rubens*), and Mediterranean grass (*Schismus arabicus* and *S. barbatus*). If left undetected, unmonitored, and unmanaged, nonnative herbaceous species could fundamentally alter BMGR's ecosystem structure through competition with native species, reduction of species diversity, and enhancing the spread of wildfires (Villarreal, Miguel L., et al., 2011).

Table 6. Ecological Characteristics of BMGR Natural Communities as Assessed by The Nature Conservancy

Natural Community Element	Composition	Structure	Function/Ecological Process	Physiographic Occurrence	Associated Soil Characteristics
Valley Bottom Floodplain Complex	Characteristic vegetation includes creosotebush, triangle-leaf bursage, white bursage, acacias, paloverdes, mesquites, and annual and perennial grasses.	Community occurs as patchy shifting mosaics of sparse vegetation in the relatively dry areas interspersed with dense vegetation within shallow depressions where water accumulates. Linear occurrences of vegetation characteristic of the Valley Xeroriparian Scrub community may be present within this complex.	Forms on nearly flat terrain (valley bottoms) where sheet flow may be an important hydrological phenomenon. Vegetation provides forage, cover, nest sites and perches for wildlife.	Vegetation is located at the base of pediments and extends onto valley floors. Examples within the BMGR are found in the Growler and San Cristobal Valleys.	Generally forms on deep loams and sandy loams that are often prone to accelerated erosion.
Valley Xeroriparian Scrub	Characteristic vegetation is highly variable and includes blue paloverde, ironwood, mesquite, foothill paloverde, herbaceous and woody perennial vines, and sparse annual grasses and forbs.	Found in narrow linear strips in downcut channels with a moderate to dense layer of trees and shrubs that are generally less than five meters tall. Herbaceous layer typically is sparse.	Channel-constricted flow is the dominant ecological process. Frequency and amount of runoff, shading, and channel scouring influence xeroriparian vegetation gradients.	Found on mountain slopes with less than 6 percent grade and extending onto valley bottoms. On the BMGR, this community is most predominant in the more arid areas west of State Route 85. Daniels Arroyo is a good example.	Generally located on coarse-textured substrates, but also gravelly silty loams.
Mountain Xeroriparian Scrub	Characteristic vegetation is highly variable but typically consisting of paloverdes, ironwood, mesquites, and succulents.	Found in narrow linear strips in downcut channels with a moderate to dense layer of trees and shrubs that are generally less than five meters tall. Herbaceous layer typically is sparse.	Channel-constricted flow is the dominant ecological process.	Community is found on upper bajadas and low- to moderate- elevation mountain slopes with more than a 6 percent grade.	May be on exposed bedrock on upper mountain slopes. Soils are generally not saline.
Dune Complex and Dune Endemics	Complex is generally sparsely vegetated by scattered forbs and grasses. May include shrubs and dwarf-shrubs such as white bursage. Stabilized dunes may support creosotebush and mesquites while active dune fields may lack vegetation.	Community occurs as patchy shifting mosaic within Creosotebush-Bursage Desertscrub. Includes active open dunes, stabilized dunes, and stabilized flat “sand sheets.” This complex has a sparse and seasonally variable herbaceous layer with a sparse cover of shrubs that are less than two meters tall.	Contains a high number of endemic species that have adapted to moving sand. Water may be held for long periods just under the surface by sand.	Active, stabilized, and partially stabilized dunes found in valleys. On the BMGR, dune complexes are found west of the Mohawk Mountains, in the Gran Desierto southeast of Yuma, in San Cristobal Valley, and in the northern Growler Valley.	Area consists of sand dune complexes.
Creosotebush-Bursage Desertscrub	Vegetation is primarily dominated by creosotebush. Woody and non-woody cacti and rosette succulents commonly occur on rocky slopes. Seasonally present perennial grasses with some perennial forbs dominate the sparse herbaceous layer.	Includes extensive networks of Valley Xeroriparian Scrub communities with large patches of active and stabilized dune complexes. Vegetation typically includes sparse to moderately dense layers of microphyllous and broad-leaved evergreen subshrubs and shrubs less than two meters tall.	Linear xeroriparian systems and large patch dune fields nested within the creosotebush-bursage “matrix” dominate.	Community is found on lower bajadas and intermountain basins that are generally flat or on gentle to moderate slopes. The lower bajadas and valley west of the Saucedo Mountains is a good example of this community.	Substrate is usually sandy or gravelly alluvium derived from limestone and metamorphic rocks. Soils are typically of low salinity.
Creosotebush-Big Galleta Scrub	Dominant shrub is Creosotebush. Big galleta is the sole or dominant grass in the herbaceous layer. White or triangle-leaf bursage can be a co-dominant.	Scattered shrubs and dense grasses typically form the first two layers of vertical structure of this complex. A tree canopy provides a third layer when mesquite is present.	Located on highly erodable sands around downcutting desert washes. Also sometimes found on hillsides where sand has accumulated downwind and vegetation has been dispersed by birds.	Community may be found growing on flat ridges, low gradient slopes and among stabilized sand dunes in portions of the Mojave and Sonoran deserts. The only mapped occurrence of the community is located in the Sentinel Plain area.	Soils generally consist of sandy loam. These soils are well-drained.

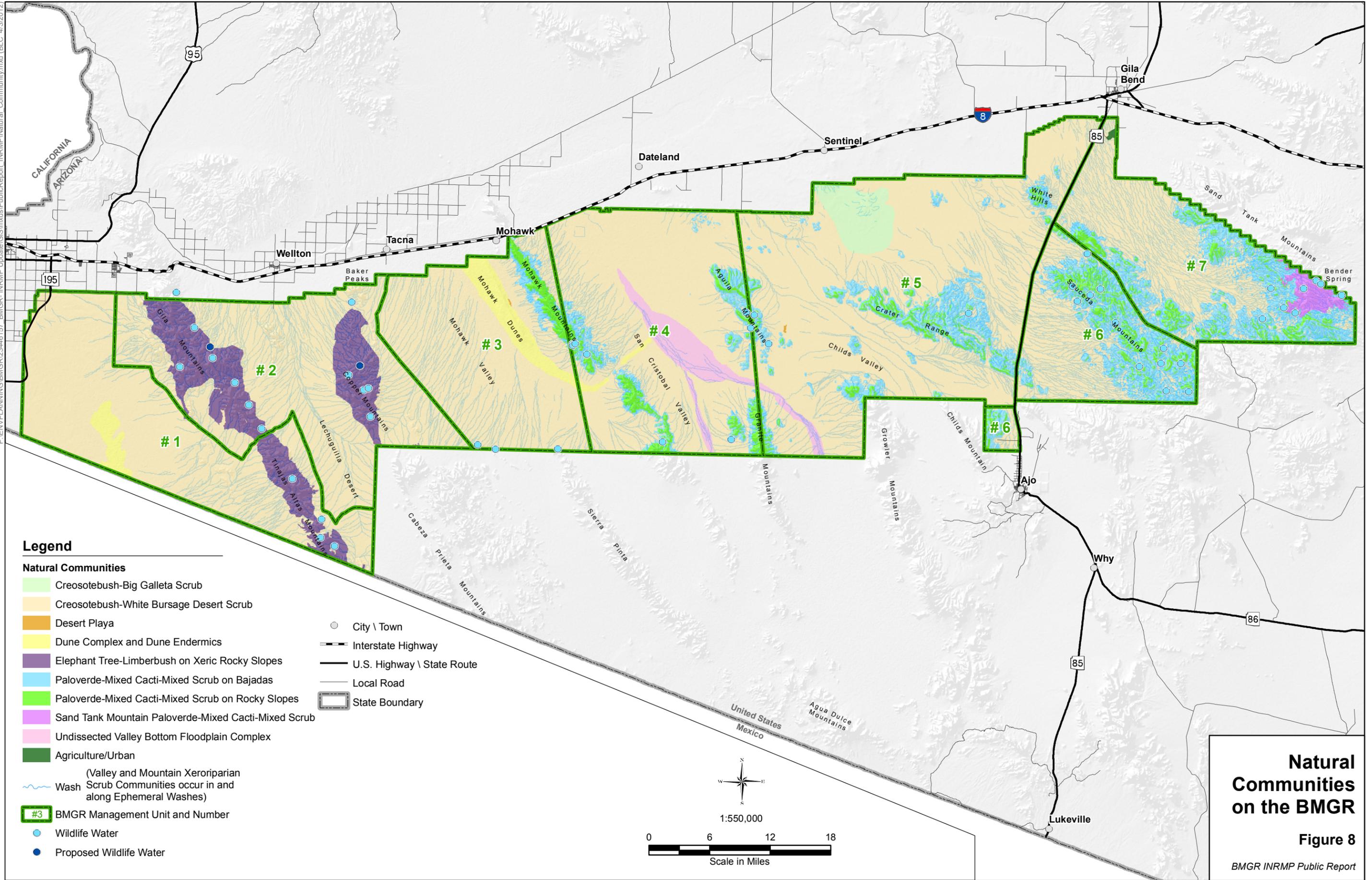
Table 6. Ecological Characteristics of BMGR Natural Communities as Assessed by The Nature Conservancy

Natural Community Element	Composition	Structure	Function/Ecological Process	Physiographic Occurrence	Associated Soil Characteristics
Paloverde-Mixed Cacti-Mixed Scrub on Bajadas	Vegetation has a conspicuous but relatively sparse layer of saguaro cactus. A sparse to moderately dense short tree/tall shrub canopy is also present consisting of paloverde and creosotebush, along with ironwood and ocotillo in lesser prominence. A sparse herbaceous layer dominated by perennial grasses and forbs with seasonal annuals is present.	The dominant vegetation occurs in sparse to moderately dense woody layers of short shrubs, tall shrubs, and short trees, ranging from one-half to five meters tall. The herbaceous layer is generally sparse with scattered perennial grasses and forbs. The uppermost layer consists of a layer of large columnar cacti.	Linear xeroriparian systems occur nested within the community. Climate extremes may cause die-back of many plant species.	This community typically surrounds rocky slopes of low mountain ranges. The best example of this community on the BMGR occurs on the lower slopes and bajadas of the Sand Tank Mountains.	Soil generally consists of gravelly alluvium that is derived from basalt. Soil substrates are generally coarse-textured, shallow, gravelly clay loams. Caliche is a common characteristic.
Paloverde-Mixed Cacti-Mixed Scrub on Rocky Slopes	This community is of similar composition to that of the Paloverde-Mixed Cacti-Mixed Scrub on Bajadas, but contains additional associates such as <i>Opuntia bigelovia</i> .	This community is found along narrow drainages throughout large patches of sparse to clumped vegetative canopies. It generally occurs on highly irregular bedrock outcrops.	Linear xeroriparian systems are nested with the matrix of this community. Climate extremes may cause die-back of many plant species in this community.	This community is found throughout low mountain ranges, primarily above the major pediments. The best example on the BMGR occurs in the Saucedo Mountains.	This community occurs on highly irregular bedrock outcrops. Soils are generally of the Lithic Camborthids-Rock Outcrop-Lithic Haplargids Association, which are typically composed of very cobbly to cobbly loams, very stony to stony loams, gravelly very fine sandy loams, and rock outcrops. Soils of these mountains are subject to slight water erosion.
Sand Tank Mountains Uplands	Vegetation in this complex includes saguaro cactus and a sparse to moderately dense short tree/tall shrub canopy consisting of paloverde and creosotebush. Typical associates include crucifixion thorn and <i>Vaquelinea californica sonorensis</i> . Also present is a sparse herbaceous layer dominated by perennial grasses and forbs.	Large patches of a sparse to clumped vegetative canopy are found on steep, highly irregular bedrock outcrops. The structure is variable and influenced by aspect, edaphic characteristics, and sheltering cliffs and rocks.	Dynamic processes on landscapes dominated by this community involve linear xeroriparian systems that are nested within the larger community. Climate extremes may result in the periodic die-back of many plant species.	This community occurs at high elevations in and around the Sand Tank Mountains.	The community occurs on steep, rocky slopes. Soils of these mountains are subject to slight water erosion. They are comprised principally of the Lithic Camborthids-Rock Outcrop-Lithic Haplargids Association, which are generally very cobbly to cobbly loams, very stony to stony loams, gravelly very fine sandy loams, and rock outcrops.
Elephant Tree-Limberbush on Xeric Rocky Slopes	The composition of this community is similar to that of the Paloverde-Mixed Cacti-Mixed Scrub system, but is characterized by additional associates. Elephant tree, limberbush, <i>Nolina bigelovii</i> , and <i>Rhus kearnyi</i> are dominant in a mixed canopy. Vegetation of this system may differ with substrate.	This community forms large patches with a sparse to clumped vegetative canopy on highly irregular bedrock outcrops.	Linear xeroriparian systems are nested with the matrix of this community. Climate extremes may result in the periodic die-back of many plant species.	This community is found throughout low mountain ranges in the most arid portions of the Lower Colorado Valley and Arizona uplands of the Sonoran Desert. Mountain Xeroriparian Scrub is found throughout the large patch community along narrow drainages. Examples of this community occur in the Tinajas Altas and Gila Mountains	The community is commonly associated with granite bedrock and granite-derived gravels at the base of the mountains.
Desert Playa	Generally desert playas in the central Sonoran Desert are sparsely vegetated, with periodic emergence of ephemeral species. Large playas in the Sonoran Desert may have surrounding rings of vegetation. Characteristic vegetation differs between playas and unpredictable annuals may emerge.	Large patches are typically formed on flat plains and basins. Deep ravines may be formed as a result of drainage into the playas, but are subsequently filled in. Desert playas are often located within a matrix of Creosotebush-Bursage Desertscrub and may be associated with active and stabilized sand dunes.	Dominant ecological processes of desert playas are periodic flooding and subsequent evaporation. Large mud cracking at Las Playas may be related to volcanic activity.	Large open expanses that support playa lakes may also serve as sand sources for dunes located down-wind. Rainfall absorbed into dune fields may serve as a water source for seepage into the playa lakes. Many playas include dissected streambeds that are erased through time. Mohawk Playa is the best example on the BMGR.	Playas are typically associated with active and stabilized sand dunes.
Desert Tinaja/Spring	Tinajas are typically small aquatic ecosystems formed through water accumulation in bedrock depressions. Vegetation is typically absent or present as a few individual plants.	The community generally appears in the form of small patches among bedrock exposures.	The periodic inflow and slow evaporation are the primary processes that support tinajas. Tinajas may retain water permanently.	This community may occur in bedrock depressions throughout the desert southwest. Examples on the BMGR include Tinajas Altas and Bender Springs.	The community is commonly associated with bedrock depressions.

Table 6. Ecological Characteristics of BMGR Natural Communities as Assessed by The Nature Conservancy

Natural Community Element	Composition	Structure	Function/Ecological Process	Physiographic Occurrence	Associated Soil Characteristics
Salt Desertscrub	Two main types of saltbush communities occur. Saltbush communities found along major riverine systems typically have been converted to agriculture. The drier upland type is associated with creosotebush and numerous cactus species. The community is dominated by the xeromorphic shrub <i>Atriplex polycarpa</i> . The sparse to moderately dense graminoid layer may be dominated by warm season medium-tall and short grasses. Forb cover is generally sparse.	This community may form large patches on desert bajadas. Vegetation typically has a sparse to moderately dense layer of shrubs up to two meters in height.	The dominant xeromorphic shrub <i>Atriplex polycarpa</i> is tolerant of saline or alkaline soils, and marks to extent of deep, fine loams soils of significant agricultural value. Periodic flooding, while infrequent, is tolerated by this community.	This community occurs on both upland and lowland sites throughout much of the arid and semi-arid western United States. Lowland sites include alluvial flats, drainage terraces, playas, washes, and interdunal basins while upland sites include bluffs and gentle to moderately steep sandy or rocky slopes. An example of this community occurs within the San Cristobal Valley.	Soils are variable with depths ranging from shallow to moderately deep and textures ranging from sands to loams to clay. Lowland sites may be moderately saline or alkaline.

Source: (Hall, 2001)



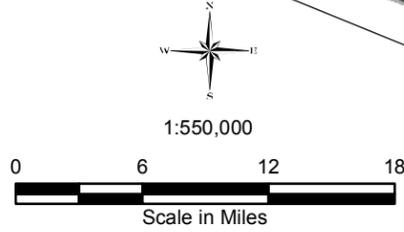
Legend

Natural Communities

- Creosotebush-Big Galleta Scrub
- Creosotebush-White Bursage Desert Scrub
- Desert Playa
- Dune Complex and Dune Endemics
- Elephant Tree-Limberbush on Xeric Rocky Slopes
- Paloverde-Mixed Cacti-Mixed Scrub on Bajadas
- Paloverde-Mixed Cacti-Mixed Scrub on Rocky Slopes
- Sand Tank Mountain Paloverde-Mixed Cacti-Mixed Scrub
- Undissected Valley Bottom Floodplain Complex
- Agriculture/Urban

- City \ Town
- Interstate Highway
- U.S. Highway \ State Route
- Local Road
- State Boundary

- (Valley and Mountain Xeroriparian Scrub Communities occur in and along Ephemeral Washes)
- Wash
- #3 BMGR Management Unit and Number
- Wildlife Water
- Proposed Wildlife Water



Natural Communities on the BMGR
Figure 8
BMGR INRMP Public Report

The spread of the winter annual plant Sahara mustard continues as the most prevalent invasive species at BMGR. The spread of the species is more of a concern on BMGR West because the soil generally contains more sand than on BMGR East and the Sahara mustard favors sandy soil. Differences in winter precipitation between BMGR West and East may also indirectly contribute to the prevalence of this species, and its population usually booms after wet winters. However, with generally lower winter precipitation, BMGR West is more affected by this species than the wetter BMGR East. Habitat type, species competition and some other biotic and abiotic factors are likely having substantial influence on the spread of the species. Sahara mustard has the potential to produce a dense monoculture ground cover that is highly flammable and can alter native plant diversity. Because plant communities in the Sonoran Desert are not adapted to fires, wildfires typically have devastating results, and recovery takes many years.

Besides natural conditions, human activities also strongly influence the Sahara mustard spread. Roads alter drainage patterns and catch water to support Sahara mustard growth, and can provide preferred conditions for germination of this species by burying the seeds (particularly with the use of tire drags to smooth road surfaces). Additionally, seeds may collect in wheel wells or other vehicle parts and then, as vehicles are driven along roads, the seeds may be dispersed.



Sand dunes are unique ecological systems that, within the BMGR, are composed of sediments transported by wind from northern portions of the Gulf of California.

3.4.2.1 BMGR West

Recognizing the need for more detailed vegetation maps that correspond with the National Vegetation Classification Standard, the BMGR managers have supported association level mapping by working with the Desert Southwest Cooperative Ecosystem Studies Unit of the University of Arizona. As of 2012, approximately 75 percent of the BMGR has been mapped (McLaughlin et al. 2007; Osmer et al. 2009; Malusa 2010; Shepard 2011). Virtually all of the range will be mapped by 2014.

Given the current knowledge of the spread of Sahara mustard and the uncertainty of how environmental factors promoting or limiting its invasion, there is an urgent need for studying how variation in complex physical and biotic environmental factors affect the population growth of Sahara mustard and how the species disperse through natural and human created corridors (e.g., roads). The knowledge gained from such studies will provide strong scientific insight for managing this species on the range. In partnership with Luke AFB, MCAS Yuma also has contracted a three-year study (FY2011-FY2013) with the University of Arizona to characterize and model Sahara mustard invasion throughout the BMGR. This study combines field measurements, controlled experiments, and mathematical modeling to determine environmental factors that affect its success and the long-term impact on native winter annual plants. More specifically, it will examine how spatial variation in both biotic and abiotic environments affect the population growth of Sahara mustard as well as its impact on native annual plants. It will also quantify the natural dispersal range of the species in order to estimate the rate of spread of the species in its nearly established habitats.

While most recreational visitors to BMGR West have been complying with the prohibition on off-road driving, there has been some off-road vehicle use, particularly associated with geocaching. Geocaching is a “treasure” hunt, in which individuals obtain information from geocaching websites about where a “treasure” has been hidden and then attempt to navigate to the location using global positioning system (GPS) coordinates. Some participants in this activity leave the designated road system and drive cross-country in direct pursuit of the geocache. Resource damage, including the spread of invasive plants, from geocaching has not yet reached a level of concern that would warrant new limitations on the activity, but MCAS Yuma Range Wardens have been meeting with geocaching participants and other recreational groups in an outreach effort to curb the off-road driving violations before harsher enforcement becomes necessary. Another factor in the spread of invasive plants in BMGR West over the past five years is the ground disturbance associated with drag roads and the drag areas around rescue beacons and along the border fence. A network of rescue beacons has been installed throughout BMGR West in an effort to mitigate UDI injuries and/or fatalities caused from the region’s extreme environment. The Border Patrol periodically will smooth out the area around the rescue beacons, and along the border fence to monitor for recent traffic. These drag areas were originally intended to be minimal in size, but continue to be enlarged over time from expanded dragging. These disturbance areas, as well drag roads, are of particular concern for the spread of invasive species that thrive in disturbed soils.

Wildfires greater than a few acres were almost unknown at the BMGR until the last 10 years because the low densities of native Sonoran desert vegetation typically do not provide sufficient fuel to carry a fire over large areas. The spread of invasive plants, however, has substantially raised the threat that wildfire poses to native vegetation and wildlife because the invasive species of concern grow in high densities, will readily carry a wildfire, and recover from fire more readily than native species, thereby choking out the native plant. A wildfire that was evidently fueled by Sahara mustard burned about 500 acres of native creosote-bursage community at BMGR West in 2008 or 2009. Field inventory showed that the mustard was the only species recovering in the area after the fire (Malusa, 2010). In addition to degrading the quality of the range for native plant species and wildlife, wildfires also can interfere with military training activities and readiness.

3.4.2.2 *BMGR East*



An observable expansion of buffelgrass, an invasive species, along SR 85 and outside the BMGR fence line is a concern on the east side of the range.

The spread of invasive species is also a concern at BMGR East. There has been an observable expansion of buffelgrass along the SR 85 corridor. The vast majority of this expansion is occurring outside of the BMGR fence line on the highway right-of-way. One notable exception is a portion of Area B, south of the Crater Mountains, where buffelgrass appears to be extending from the highway inside the fence line along several small drainages. There is also a small isolated patch approximately 1,300 feet in length inside the fence where a number of seedlings were observed in October 2011.

Two other invasive species that are widespread at BMGR East are schismus grasses (*Schismus spp.*) and Sahara mustard. Schismus grasses are widespread throughout the range and are most common on fine grained soils. Sahara mustard is most common west of SR 85 and has become well established along many of the NTAC and STAC roadways and several target areas. Both schismus grasses and Sahara mustard are annual weeds that appear to be largely weather dependent and are much more abundant following wet winters.



Aerial application of herbicide can control the spread of invasive vegetation.

The Air Force has prepared an Environmental Assessment (EA) for a proposed program to control Sahara mustard at BMGR East. The purpose of controlling the Sahara mustard is to reduce wildfire risk and improve range quality for wildlife. The proposed action would implement an integrated pest management program consisting of a combination of physical removal of plants by hand and applications of herbicide by ground equipment and aircraft including an Air Force C-130 outfitted for pesticide dispersal. The Draft EA was released in January 2012.

Drag roads and vehicle use can contribute to vegetative disturbance and the spread of invasive species. The rescue beacons near the Range 1 water well and in San Cristobal Valley have not experienced the level of damage from dragging the areas around the beacons that has occurred in BMGR West. However, off-road driving associated with Border Patrol operations have had more of an impact throughout the San Cristobal Valley, where there are no physical barriers to discourage off-road driving, and at the Mohawk Dunes. No ground or aerial surveys have been conducted to quantify the level of disturbance and the increase has been noted through observations made by range personnel.

A total of 87 wildfires were recorded at BMGR East from 2006-2011. All fires were small in size, and typically located within the target complex. Three grass fires along SR 85 were each about 1/10 acre. Invasive plants did not play a role in the spread of fire. However, wildfires in 2005 burned about 130,000 acres of BMGR East and required emergency intervention from the National Interagency Fire Center. This was considered a rare event attributable to the heavy winter rains that year, but the spread of invasive species provided the fuel to carry the fire. In response, the 56 Range Management Office (RMO), in its role of natural and cultural resource management at BMGR East for Luke AFB, teamed with experts from the U.S. Forest Service to write the first-ever fire management plan for BMGR East.

3.5 WILDLIFE

3.5.1 Overview

The available inventories currently show that over 200 bird species, more than 60 species of mammals, 10 amphibian species, and over 50 reptile species continue to occur or may potentially occur within the BMGR and the adjacent Cabeza Prieta NWR combined. Available evidence indicates that the diversity of wildlife species and habitats present in 1941 when the BMGR was established continue to be found within the range today in abundances that are relatively stable and typical for this portion of the Sonoran Desert. This may be attributed to several factors including:

- The land is withdrawn for military use, which has excluded or limited other land uses—such as livestock grazing, farming, mining, and intensive off-road vehicle recreation—that potentially would have altered physical and biological systems to a greater extent than has military training
- Ecological interconnections with two national monuments and one national wildlife refuge have remained unfragmented and undiminished
- The primary use of the land, aviation training, has limited on-ground disturbances of soils and vegetation to a relatively small and dispersed proportion of the range
- Restrictions and limits on public access and use have left many portions of the range free of disturbances from intensive and concentrated recreation activities
- The BMGR is far from major metropolitan areas, which has likely minimized public visitation and the effects of prolonged intensive use
- Surface drainage patterns generally isolate the range and its surrounding area hydrologically, which have protected it from upstream water-borne pollutants, sedimentation, and watershed modification

3.5.2 Update

The condition of BMGR’s ecosystem and most of its individual resident wildlife populations generally continues to be good. The health and resiliency of most resident wildlife populations continue to be supported by relatively high-quality and secure habitats. Still, some threats to wildlife populations and habitat are of concern including a growing problem with trespass livestock and feral burros at BMGR East (see Section 3.5.2.2), the spread of invasive species and associated increases in vulnerability to wildfire (see Section 3.4.2), and persistent and reoccurring drought, which may be related to climate change (see Section 3.2). For at least the immediate future, the threat to habitat and wildlife from illegal cross-border traffic seems to have been sharply diminished by the completion of the border barrier fence but continuing Border Patrol activities are of some concern (see Section 3.3.2). To date, a need to restrict military use or public recreation activities to conserve or rehabilitate habitat has not been identified. More than 87 percent of the range surface has received no or low levels of disturbance from the past 70 years of military use, and less than 1 percent of the surface has been highly to completely disturbed. Military activities continue to be focused primarily in the same historic areas of use.

The 2007 INRMP provided that new wildlife water developments would be limited to six high-priority sites for the first five years of plan implementation. Water developments for recovering endangered or threatened species are not subject to the six priority waters limit.

Bird/Animal Aircraft Strike Hazard (BASH) reduction plans are developed for DoD military installations where elevated hazards exist and can be controlled. BASH concerns are greatest when aircraft fly at low altitude (including takeoff and landing), rather than for in-flight operations that are typical at the BMGR. MCAS Yuma has not identified a need



The Air Force worked together with AGFD to establish one of the six priority wildlife water developments within BMGR East.

for a BASH Reduction Plan at BMGR West. A BASH Reduction Plan is in place at BMGR East for Gila Bend AFAF, where there is a runway.

3.5.2.1 *BMGR West*

Plans for installing two of the priority wildlife waters sanctioned for development at the BMGR are underway for sites in BMGR West. Locations of existing and proposed wildlife waters at the BMGR are shown in Figure 8.

Monitoring planned in the 2007 INRMP of non-game birds has been initiated. The population data collected thus far indicate that population numbers are healthy and not in decline. Requests for additional monitoring studies are pending approval of funding requirements.

3.5.2.2 *BMGR East*

One wildlife water was completed in BMGR East in 2012; the new Halliwill water catchment, located in STAC was developed as a recovery action for Sonoran pronghorn. The old Halliwill water catchment, about 1 mile east of the new catchment, is no longer functional and will be removed. Some established, but deteriorating, wildlife waters within BMGR East have been upgraded or rebuilt. The Air Force has also completed compliance actions related to the installation of a wildlife water at the location of the Site 1B pronghorn feed station. The Air Force continues to support AGFD in the annual maintenance of developed wildlife waters, and supported the renovation of existing and installation of new wildlife water catchments. Maintenance and in-kind-replacement of existing water catchments are not subject to the limits on new catchments provided by the 2007 INRMP.

Trespass cattle, feral burros, and horses from adjacent lands were reported in the 2007 INRMP as a periodic problem at BMGR East, particularly in Management Units 6 and 7 (see Figure 8). Plant communities in some locations are affected by grazing pressures by trespass livestock and burros, which can impact native wildlife species. Trespass animals can also deplete water stored for wildlife at developed wildlife drinkers. Trespass livestock and feral burros continue to be a regional problem. Burros, in particular, appear to be expanding in numbers, particularly in Area B, and have caused observable damage to native vegetation. Burro sign (droppings, tracks, and trails) also has been recently noted on the west side of SR 85 on Manned Range 1. AGFD and USFWS personnel reported observing a herd of 20 burros at Manned Range 1 in December 2011 during the aerial census for Sonoran pronghorn.



Trespass livestock continues to be a regional problem.

Trespass cattle are also occasionally observed in Area B, in the Bender Springs/Paradise Well area, and at Manned Range 1, but there is no indication that their numbers are increasing. Likewise, trespass horses have recently been observed during AGFD aerial deer and javelina census flights, and during a 56 RMO reconnaissance flight over the Bender Spring/Paradise Well area, but only a few individuals were sighted.

A BASH Reduction Plan has been prepared for Gila Bend AFAF at BMGR East. In accordance with this plan, the Air Force uses the Avian Hazard Advisory System (AHAS), which is a comprehensive method of remote sensing for birds. The AHAS system evaluates weather and radar data and provides real-time alerts to aviators when concentrations of large birds are in the airspace. The AHAS is available online and coverage includes the entire continental United States. Additionally, as part of the prevention program, AHAS provides pilots and flight schedulers with a near real-time tool when selecting flight routes.

The BMGR East plan is based on Luke AFB's BASH Reduction Plan, 56 FW OPLAN 91-2, and focuses on reducing the BASH threat at the Gila Bend AFAF and at the Manned Range 1 and 2 lead-in-lines. Priority BASH management actions include vigilant threat monitoring and reporting, management of the environment at and surrounding the Gila Bend AFAF, and carrion removal along SR 85 to reduce the abundance of large avian scavengers (e.g., turkey vultures). Bird harassment and depredation at Gila Bend AFAF is authorized by USFWS through a permit issued annually to Luke ABF. Mammal depredation at Gila Bend AFAF is authorized by a permit issued annually by AGFD to 56RMO.

3.6 PROTECTED SPECIES

3.6.1 Overview

Two species listed under the ESA, Sonoran pronghorn and lesser long-nosed bat (*Leptonycteris curasoae*), are known to occur at the BMGR. Of these, only the Sonoran pronghorn appears to depend upon habitats within the BMGR and the adjacent Cabeza Prieta NWR and Organ Pipe Cactus NM for its continued survival. The lesser long-nosed bat forages but is not known to roost within the BMGR.

The flat-tailed horned lizard (*Phrynosoma mcallii*) (FTHL) has no ESA protection but is listed as threatened in Mexico, is protected by Arizona and California, and is a Wildlife Species of Concern in Arizona. The FTHL occurs in BMGR West and is managed in accordance with an Interagency Conservation Agreement and Flat-tailed Horned Lizard Rangewide Management Strategy (RMS) to which the Marine Corps and AGFD are parties.

Peirson's milkvetch (*Astragalus magdalenae peirsonii*) is a dune endemic plant known primarily from the Algodones Dunes in California and the dunes of the Gran Desierto of northwestern Sonora, Mexico. On the BMGR, it was reported from a single 1996 specimen collected near the range's western boundary. However, the specimen was subsequently assigned to a different subspecies, and Peirson's milkvetch is not currently known to exist in Arizona, although it occurs nearby in Sonora and suitable habitat exists in the Yuma Dunes in BMGR West. Surveys during 2003 and 2004 failed to find the species on the range (BMGR Task Force, 2005). The only Biological Opinion (BO) addressing effects of the BMGR military activities on Peirson's milkvetch was in 2001. In this opinion, the USFWS found that the actions proposed were not likely to jeopardize the continued existence of Peirson's milkvetch. The rationale for this conclusion was that relatively limited potential habitat existed on the BMGR and the Marine Corps activities were expected to only minimally affect those habitats (BMGR Task Force, 2005). The species has not been found during any surveys to date; however, in accordance with the 2001 BO, if the species is found at the BMGR, reinitiation of consultation with the USFWS may be warranted.

3.6.2 Update

The 2007 INRMP provided information for 25 animal and plant species that are either present or potentially present at the BMGR and that are either federally protected in accordance with the ESA and/or are an Arizona listed special status species. Table 7 provides the current federal and/or state status of the species.

Arizona also has a State Wildlife Action Plan (SWAP) which, among other goals and programs, rates the vulnerability of species. Table 7 has been modified from the 2007 INRMP to include the SWAP rating. The SWAP focuses on identifying and managing the wildlife and biotic communities of greatest conservation need.

As part of the conditions to receive federal funding for conservation programs, the U.S. Congress identified eight required elements to be addressed in each State's wildlife conservation strategy, and directed that the strategies must identify and be focused on the Species of Greatest Conservation Need (SGCN). Arizona's SWAP (previously known as the Comprehensive Wildlife Conservation Strategy) was accepted by the USFWS in 2006 (AGFD 2010(a)). As part of the SWAP, and as a funding requirement of the State Wildlife Grants program, the AGFD identified wildlife of conservation priority; these species are described as SGCN for Arizona. A SGCN is a species that are rare, declining, or vulnerable in Arizona, and are not adequately funded, or that were imperiled and in need of conservation attention. The SGCN that are known to occur, or have potential habitat on the BMGR based on the inventory and monitoring, have also been included in Table 7; many of the SGCN do not currently have a federal or state protected status.

Table 7. Federally and State Protected Species and Species of Greatest Conservation Need in Arizona on the BMGR

Common Name <i>Scientific Name</i>	Federal Status	Arizona Status/ SWAP Score	Species of Greatest Conservation Need	Species or Habitat			Federal Register Reference	Habitat or Potential Habitat at BMGR
				Present	Potential	Not Expected		
MAMMALS								
Arizona wood rat <i>Neotoma devia</i> (on the list provided by MCAS Yuma, but not on the SGCN state list)	—	—		✓				Low desert or rocky slopes; sagebrush scrub or areas with scattered cactus, yucca, and other low vegetation. When inactive, occupies elaborate den built of debris among cacti, rocks, etc. Found only in extreme western Arizona (BMGR West)
California leaf-nosed bat <i>Macrotus californicus</i>	—	WC/NA	✓	✓				Year round resident that roosts in caves or mines-and forages in desertscrub or xeroriparian vegetation (BMGR West and East)
Canyon Mouse <i>Peromyscus crinitus</i>	—	NR/1C		✓				Rocky habitats or gravel sites adjacent to rocky areas (BMGR West)
Crawford's desert shrew <i>Notiosorex crawfordi</i>	—	NR/NA ¹		✓				Not restricted to any particular vegetation type, so long as there is sufficient cover. They are often found in packrat houses, or under dead agaves, old logs, or other debris (BMGR West)
Desert bighorn sheep <i>Ovis canadensis mexicana</i>	—	NR/NA ¹	✓	✓				Desert mountain ledges and grassy basins (BMGR West and East)
Greater western mastiff bat <i>Eumops perotis californicus</i>		NR/1B	✓	✓				Lower and upper Sonoran desertscrub near cliffs, preferring the rugged rocky canyons with abundant crevices (BMGR West and East)
Kit fox <i>Vulpes macrotis</i>		NR/1C		✓				In valleys and on sandy plains in the southwestern deserts (BMGR West and East)
Lesser long-nosed bat <i>Leptonycteris curasoae yerbabuena</i>	E	WC/1B	✓	✓			53 FR 38456 dated 9-30-88	Summer resident that roosts in caves or minesand forages in desertscrub habitats (BMGR West and East)
Little pocket mouse <i>Perognathus longimembris</i>		NR/1C		✓				Found in various types of desert scrub habitats (greasewood, rabbitbrush, creosote bush, cactus, mesquite, palo verde, etc.). (BMGR West)
Mexican long-tongued bat <i>Choeronycteris mexicana</i>	—	WC/1C	✓			✓		Cave or mine-nesting/roosting, forages on saguaro and agave

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				Present	Potential	Not Expected		
Sonoran pronghorn <i>Antilocapra americana sonoriensis</i>	E	WC/1A	✓	✓			32 FR 4001 dated 3-11-67	Habitat in southwestern Arizona: vegetation includes big galleta grass, six week three-awn, six weeks grama, creosote bush, bursage, and saltbush, BMGR West and East east of the Gila and Tinajas Altas mountains
	NEP		✓	✓			76 FR 25593 dated 5-5-11	New breeding pen at Kofa NWR, relocation of some species from existing breeding pen at Cabeza Prieta NWR to BMGR East.
Southern yellow bat <i>Lasiurus ega</i>	—	WC/NR			✓	✓		In association with palm trees, may occur in vicinity (BMGR West and East)
Spotted bat <i>Euderma maculatum</i>	—	WC/1B	✓		✓	✓		Riparian areas, rocky cliffs (BMGR West)
BIRDS								
Bald eagle <i>Haliaeetus leucocephalus</i>	BGEPA	WC/1A	✓			✓	Proposed for delisting: 64 FR 36453 dated 7-6-99 Delisting: 72 FR 37346 dated 7-9-07	Aquatic habitat not found on the BMGR
Belted kingfisher <i>Ceryle alcyon</i>	—	WC/NA	✓		✓			Found near water (fresh or salt). Rare transient at BMGR.
Bendire's thrasher <i>Toxostoma bendirei</i>		NR/1C		✓				Relatively open desert grassland, shrubland or woodland with scattered shrubs or trees (BMGR West and East)
Black-tailed gnatcatcher <i>Poliophtila melanura</i>		NR/1C		✓				Desert brush, dry washes, and mesquite bosques (BMGR West and East)
Brown-crested flycatcher <i>Myiarchus tyrannulus</i>		NR/1C			✓			Found in association with saguaros; also frequents river groves and other areas where trees are large enough to provide sites for cavity nesting (MBGR East)
Cactus ferruginous pygmy-owl <i>Glaucidium brasilianum cactorum</i>	—	WC/1A	✓		✓		Delisting: 71 FR 19452-19458 dated 4-4-06, 12-Month Finding – listing not warranted: FR 61856-61894 dated 11-5-11	Xeroriparian areas (BMGR West and East)
Common poorwill <i>Phalaenoptilus nuttallii</i>		NR/1C		✓				In all Sonoran Desert habitats, but most common on sparsely vegetated bajadas (BMGR West and East)
Costa's hummingbird <i>Calypte costae</i>		NR/1C		✓				Desert and semi-desert, arid brushy foothills, chaparral; in migration and winter also in adjacent mountains and in open meadows and gardens (BMGR West and East)
Crested caracara <i>Caracara cheriway</i>	—	WC/NA	✓		✓			Semidesert, in both arid and moist habitats but more commonly in the former .Observed in Sonoran Desert NM near BMGR East

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				Present	Potential	Not Expected		
Desert Purple Martin <i>Progne subis hesperia</i>		NR/1B	✓		✓			Desert southwest in saguaro cacti cavities (BMGR East)
Elf owl <i>Micrathene whitneyi</i>		NR/1C		✓				Deserts, dry shrublands, riparian woodlands, and open pine-oak forests (BMGR West and East)
Ferruginous hawk <i>Buteo regalis</i>	—	WC/1B	✓	✓			Identified for possible listing, and a request for status information 59 FR 58982 dated 11-15-94	Arid to semiarid regions, as well as grasslands and agricultural areas. (BMGR East).
Gila woodpecker <i>Melanerpes uropygialis</i>		NR/1B		✓				All desert habitats, nesting in saguaro cacti (BMGR West and East)
Gilded flicker <i>Colaptes chrysoides</i>		NR/1B		✓				All desert habitats, nesting in saguaro cacti (BMGR West and East)
Golden eagle <i>(Aquila chrysaetos canadensis)</i>	BGEPA	NA/1A		✓				Cliffs or in large trees that afford an unobstructed view. (BMGR East)
Gray vireo <i>Vireo vicinior</i>		NR/1C			✓			Non-breeding winter resident found in desert and arid scrub, semi-open areas with scattered scrub and semi-open arid brushland. (BMGR West)
Hooded oriole <i>Icterus cucullatus</i>		NR/1C		✓				Favors groups of palms for nesting (BMGR East)
Le Conte's Thrasher <i>Toxostoma lecontei</i>		NR/1B	✓	✓				Open desert scrub, alkali desert scrub, and desert succulent scrub (BMGR West and East)
Lucy's warbler <i>Vermivora luciae</i>		NR/1C						Mesquite bosques and edges of riparian woods in desert zones (BMGR West and East)
Mountain plover <i>Charadrius montanus</i>		NR/1B	✓	✓			Withdrawal of Proposed Rule to list the Mountain Plover as Threatened 76 FR 27756 dated 5-12-11	Xeric or disturbed uplands; short vegetation, bare ground, and a flat topography. Not on the AGFD Heritage Data Management System for Maricopa, Pima, and Yuma counties. However, known to occur on BMGR East, and surveys in 2011 and early 2012 identified the plover in Maricopa County (Gila Bend AFAF), and Yuma County.
Peregrine falcon <i>Falco peregrinus anatum</i>	—	WC/1A	✓		✓		Delisting: 64 FR 46541-46558 dated 8-25-99	Isolated cliffs; winter migrant (BMGR West and East)
Phainopepla <i>Phainopepla nitens</i>		NR/1C		✓				Scrub habitats, with desert mistletoe present (for foraging) (BMGR West and East)
Prairie falcon <i>Falco mexicanus</i>		NR/1C			✓			Canyons, open country, grasslands, and deserts, (BMGR West and East)

Table 7. Federally and State Protected Species and Species of Greatest Conservation Need in Arizona on the BMGR

Common Name <i>Scientific Name</i>	Federal Status	Arizona Status/ SWAP Score	Species of Greatest Conservation Need	Species or Habitat			Federal Register Reference	Habitat or Potential Habitat at BMGR
				Present	Potential	Not Expected		
Pyrrhuloxia <i>Cardinalis sinuatus</i>		NR/NA			✓			Desert scrub and mesquite thickets (BMGR East)
Scott's Oriole <i>Icterus parisorum</i>		NR/IC		✓				Yucca gardens on desert grassland prairies, but they have been found wherever yucca is growing, even on the hillsides of mountain canyons (BMGR West and East)
Snowy egret <i>Egretta thula</i>	—	WC/NA	✓		✓			Marshes, lakes, ponds, lagoons, mangroves, and shallow coastal habitats. (May appear during seasonal migration BMGR West and East)
Southwestern willow flycatcher <i>Empidonax traillii eximius</i>	E	WC/1A	✓			✓	60 FR 10693 dated 2-27-95 Revised critical habitat: 76 FR 50542-50629 8-15-11	Well-developed riparian areas with cottonwood, willow, or tamarisk are not present on the range
Sprague's pipit <i>Anthus spragueii</i>	C	WC/1A	✓		✓		Listed as Candidate: 75 FR 56028 dated 9-15-10, Lowered Listing priority number (LPN) from 2 to 8, 76 FR 66370 dated 10-26-11	Winters in grassy fields along lower Colorado River from north of Yuma to Parker. (May be expected occasionally at BMGR West)
Tropical kingbird <i>Tyrannus melancholicus</i>	—	WC/NA	✓		✓			Situations with scattered trees, savanna, open woodland, forest edge, plantations, residential areas and agricultural lands
Varied bunting <i>Passerina versicolor</i>		NR/IC			✓			Streamside thickets, brush mostly in areas of dense thorny brush, often with an upper story of scattered trees. (BMGR East)
Western screech-owl <i>Megascops kennicottii</i>		NR/IC		✓				Southern populations inhabit lowland riparian forests, oak-filled arroyos, desert saguaro and cardon cacti stands, Joshua tree and mesquite groves, and open pine and pinyon-juniper forests. (BMGR West and East)
White-throated swift <i>Aeronautes saxatalis</i>		NR/IC		✓				Rocky cliffs and canyons, typically found nesting in arid regions, but near major rivers. (BMGR West and East)
Yuma clapper rail <i>Rallus longirostris yumanensis</i>	E	WC/1A	✓			✓	32 FR 4001 dated 3-11-67	Marsh habitat not found on the BMGR
REPTILES								
Colorado Desert fringe-toes lizard <i>Uma notata</i>		NR/NA ¹		✓				Restricted to sparsely vegetated windblown sand of dunes, flats, riverbanks, and washes. (BMGR West)

Table 7. Federally and State Protected Species and Species of Greatest Conservation Need in Arizona on the BMGR

Common Name <i>Scientific Name</i>	Federal Status	Arizona Status/ SWAP Score	Species of Greatest Conservation Need	Species or Habitat			Federal Register Reference	Habitat or Potential Habitat at BMGR
				Present	Potential	Not Expected		
Desert night lizard <i>Xantusia vigilis</i>		WC in Mohave County only /NA		✓				Arid and semiarid, among fallen leaves and trunks of yuccas, agaves, cacti, and other large plants, also in crevices of rock outcroppings and under logs and bark of foothill pines; it ranges locally into pinyon-juniper, sagebrush-blackbrush, and chaparral-oak. (BMGR West)
Desert rosy boa <i>Lichanura trivirgata gracia</i>	SC	NR/NA ¹	✓	✓				Rocky areas in desert ranges, especially in canyons with permanent or intermittent streams. (BMGR West)
Desert tortoise (Sonoran population) <i>Gopherus agassizii</i>	C	WC/1A	✓	✓			Listed as Candidate: 76 FR 66370 dated 10-26-11	Sonoran desertscrub and semidesert grassland, prefers rocky slopes and bajadas. (BMGR East)
Flat-tailed horned lizard <i>Phrynosoma mcallii</i>	CA	WC/1A	✓	✓			Withdrawal of proposal to list 76 FR 14210 dated 3-15-11	Creosote flats, sand dunes, and mud hills in southeastern California, southwestern Arizona, and northwestern Mexico (BMGR West)
Long tailed brush lizard <i>Urosaurus graciosus</i>		NR/NA ¹		✓				The Lower Colorado River Sonoran Desertscrub community and can be a common sight in creosotebush-lined desert flats with sandy soil and along tree lined drainages (BMGR West)
Mexican rosy boa <i>Lichanura trivirgata trivirgata</i>	SC	NR/NA ¹	✓	✓				On or near rocky mountains or hillsides in desert ranges, where they inhabit the granite rock outcroppings that absorb the sun's rays providing heat and cover (BMGR West)
Yuma Desert fringe-toed lizard <i>Uma notata rufopunctata</i>	—	WC/NR	✓	✓				Restricted to sparsely vegetated windblown sand dunes and sandy flats; it requires fine, loose sand for burrowing; vegetation is usually scant, consisting of creosote bush or other scrubby growth. (BMGR West and East)
AMPHIBIANS								
Western (or Great Plains) narrow-mouthed toad <i>Gastrophryne olivacea</i>	—	WC/1C	✓		✓			Moist crevices or burrows, near ephemeral water sources (BMGR West and East)
PLANTS								
Acuña cactus <i>Echinomastus erectocentrus</i> var. <i>acunensis</i>	C	HS/		✓			64 FR 57533, dated 10-25-99, High Priority for listing (LPN #3). 76 FR 66370 dated 10-26-11	The Arizona Upland Subdivision of the Sonoran Desertscrub biotic community, tending to be located at the western, warmer, drier perimeter of the Subdivision within the Palo-Verde Saguaro Association Only one confirmed individual observed in BMGR East

Table 7. Federally and State Protected Species and Species of Greatest Conservation Need in Arizona on the BMGR

Common Name <i>Scientific Name</i>	Federal Status	Arizona Status/ SWAP Score	Species of Greatest Conservation Need	Species or Habitat			Federal Register Reference	Habitat or Potential Habitat at BMGR
				Present	Potential	Not Expected		
Peirson's milkvetch <i>Astragalus magdalenae</i> var. <i>peirsonii</i>	T	—			✓		63 FR 53596-53615 dated 10-6-98; critical habitat 64 FR 47329-47351 dated 8-4-04, Petition to remove from listing not warranted; 73 FR 41007, dated 7-17-08	Slopes of mobile sand dunes in the Sonoran desert scrub plant community No confirmed occurrences but Yuma Dunes in BMGR West are potential habitat
Sand food <i>Pholisma sonora</i>	—	HS		✓				Drifting sand below 500 ft. elevation in creosote bush scrub (Yuma Dunes in the extreme southwestern portion of BMGR West)

NOTES:

The Yuma puma has been omitted from the table. While the Yuma puma had been list as a wildlife species of concern, genetic research completed subsequent to the creation of the list showed that the subspecies ranking was not correct.

A list of migratory birds protected by the Migratory Bird Treaty Act can be found at 50 CFR 10.13.

Except for the mountain plover and golden eagle, the species listed on Table 7 were derived from the 2007 INRMP Table 4.

BGEPA=Species protected by provisions in the Bald and Golden Eagle Protection Act.

C=Candidate

CA=Species managed under Conservation Agreement with the USFWS

E=Endangered

HS=Highly Safeguarded

NEP=Nonessential Experimental Population

PT=Proposed Threatened

SC=Species of Concern

T=Threatened

WC=Wildlife Species of Concern in Arizona – WC species are the same as those in Threatened Native Wildlife in Arizona (1988)

Arizona score of vulnerability criteria:

NR=Not Rated

NA=Not Applicable

1A=Scored “1” for vulnerability in at least one of nine vulnerable categories, or is a T, C species, or is covered under a signed conservation agreement, or protected under the BGEPA, or requires post-delisting monitoring, or is petitioned for listing

1B=Scored “1” for vulnerability, but match none of the listing criteria under 1A.

1C=Unknown status species.

SOURCES: (AGFD, 2012(b), (USFWS, 2012b), (AGFD, 2010(a), MCAS Yuma 2012, Luke AFB 2012, NatureServe 2012.

¹ The species is not on the Arizona lists, but identified by MCAS Yuma as a SGCN

The U.S. Air Force, U.S. Marine Corps, USFWS, and AGFD all have responsibilities for the management and recovery of species at the BMGR that are protected in accordance with the ESA. On 11 August 2008, the USFWS (Region 2) and the Arizona Game and Fish Commission entered into an MOU with the purpose of facilitating joint participation, communication, coordination, and collaboration between the USFWS and AGFD for implementing the ESA within the State of Arizona. The MOU is applicable to the species for which both parties have management authorities.



Wildlife surveys are important biological resource management tools. Range biologists continue to study the distribution and behavior of the desert tortoise.

More than 800 migratory bird species are protected by the Migratory Bird Treaty Act (MBTA) (1918), which makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale any migratory bird, or the parts, nests, or eggs of such a bird; except as authorized under a valid permit. The MBTA defines “Take” as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” The USFWS issued a Final Rule on the Take of Migratory Birds by the Armed Forces wherein, the Final Rule authorizes a take, with limitations, that result from military readiness activities of the Armed Forces (Federal Register, 2007b).

Executive Order 13186 directs agencies to take certain actions to further strengthen migratory bird conservation under the conventions under the MBTA, the Bald and Golden Eagle Protection Act (BGEPA), and other pertinent statutes. It requires the establishment of MOUs between the USFWS and other Federal agencies. Accordingly, DoD and USFWS implemented an MOU in 2010 to promote the conservation of migratory birds (DoD and USFWS 2006). This MOU describes specific actions that should be taken by DoD to advance migratory bird conservation; avoid or minimize the take of migratory birds; and ensure DoD operations-other than military readiness activities-are consistent with the Migratory Bird Treaty Act.

Most species of birds found at the BMGR are provided MBTA protection. MCAS Yuma and Luke AFB have prepared a Bird Check List that is provided to visitors if requested. The list identifies species that may be sighted at the BMGR; the species list is extensive and is not repeated in this document.

The BGEPA (16 U.S.C. 668) as amended in 1972 prohibits any form of possession or taking of bald or golden eagles (including any part, nest, or egg), unless allowed by permit. The BGEPA defines “take” as “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” In September 2009, the USFWS announced a final rule on two new permit regulations that would allow for the take of eagles. The permits will authorize limited, non-purposeful take of bald and golden eagles, which include authorizing government agencies to disturb or otherwise take eagles in the course of conducting lawful activities, such as operating airports. Most permits issued under the new regulations would authorize disturbance, and in limited cases, a physical take (USFWS, 2011a).

3.6.3 Changes in the Protection Status of Species since the 2007 INRMP

Changes over the last five years in protection status of five species at or potentially at the BMGR are summarized in this section.

Bald Eagle. On 9 July 2007, the USFWS announced that the bald eagle has recovered, and removed the threatened status of the species from the lower 48 states Federal List of Endangered and Threatened Wildlife (Federal Register, 2007c). The bald eagle remains a wildlife species of concern in Arizona, and is protected under the BGEPA; however, the eagle is not expected to occur at the BMGR.

Golden Eagle. The golden eagle is protected under the BGEPA, and is identified on the BMGR Bird Checklist as a probable breeding species. Prior to 2007, the golden eagle had been considered a rare species at the BMGR. However, BMGR East biologists have observed the golden eagle regularly at BMGR East since 2007, and there has been one to three nesting pairs sighted each year.

Sprague's Pipit. The Sprague's pipit (*Anthus spragueii*) has been listed as a federal species of concern, and continues to be considered a wildlife species of concern in Arizona; however, the species is not listed as occurring in Maricopa, Pima, or Yuma counties, which are the counties in which the BMGR is located.

Desert Tortoise. On 26 October 2011, the Sonoran population of the desert tortoise (*Gopherus agassizii*) was identified by the USFWS as a candidate for listing as threatened (Federal Register, 2010(a)). The Sonoran population of the desert tortoise also is categorized as a wildlife species of special concern by the State of Arizona. The tortoise is known to occur at BMGR East, and Luke AFB has provided funding for the AGFD to continue a study on the distribution and behavior of the desert tortoise on the BMGR. A desert tortoise was sighted on BMGR West in the 2008-2009 timeframe. AGFD was subsequently awarded a Legacy grant to develop a landscape-level model to predict desert tortoise occurrences on the BMGR (as well as the Yuma Proving Grounds), but there were no actual sightings (Grandmaison, 2012).

Acuña Cactus. On 12 December 2011, the USFWS announced a pre-proposal notification and information request for acuña cactus (*Echinomastus erectocentrus* var. *acunensis*) to review information on the species to determine if the acuña cactus warrants protection under the ESA. The acuña cactus is currently protected by the Arizona Native Plant Law as a highly safeguarded protected native plant. There is one confirmed sighting of an acuña cactus in BMGR East. The plant has not been detected in BMGR West, nor is it expected to occur.

3.6.4 Federally Listed Threatened and Endangered Species

Threatened and endangered species at both BMGR West and East are managed in accordance with the ESA. The 26 August 2005 BO for the 17 proposed actions for the 2007 INRMP (AESO/SE 02-21-05-F-0492) addresses both BMGR East and BMGR West with regard to the Sonoran pronghorn, lesser long-nosed bat, and cactus ferruginous pygmy-owl. The review of the possible effects found that the 17 proposed INRMP actions were not likely to jeopardize the continued existence of the Sonoran pronghorn, and were not likely to adversely affect the bat or the pygmy-owl.



The BMGR supports diverse wildlife species.

The Arizona population of cactus ferruginous pygmy-owl was added to the Federal endangered species list in March 1997 as a distinct population segment, but was delisted as of 15 May 2006. A 12-month finding issued from the USFWS on 5 November 2011 reaffirmed that the listing of the species was not warranted (USFWS, 2012b). The species retains its protected status under the Migratory Bird Treaty Act, and is a wildlife species of concern in Arizona. The cactus ferruginous pygmy-owl may potentially occur within the easternmost portions of the BMGR, but this species has not yet been confirmed as utilizing the range and is not further addressed here. The current status of the Sonoran pronghorn and lesser long-nosed bat management at the BMGR are addressed in the following subsections. The FTHL is also addressed as conservation of this species at BMGR West has been an important factor in preventing a decline in the population of this species that likely would trigger reconsideration for ESA protection.

3.6.4.1 Sonoran Pronghorn

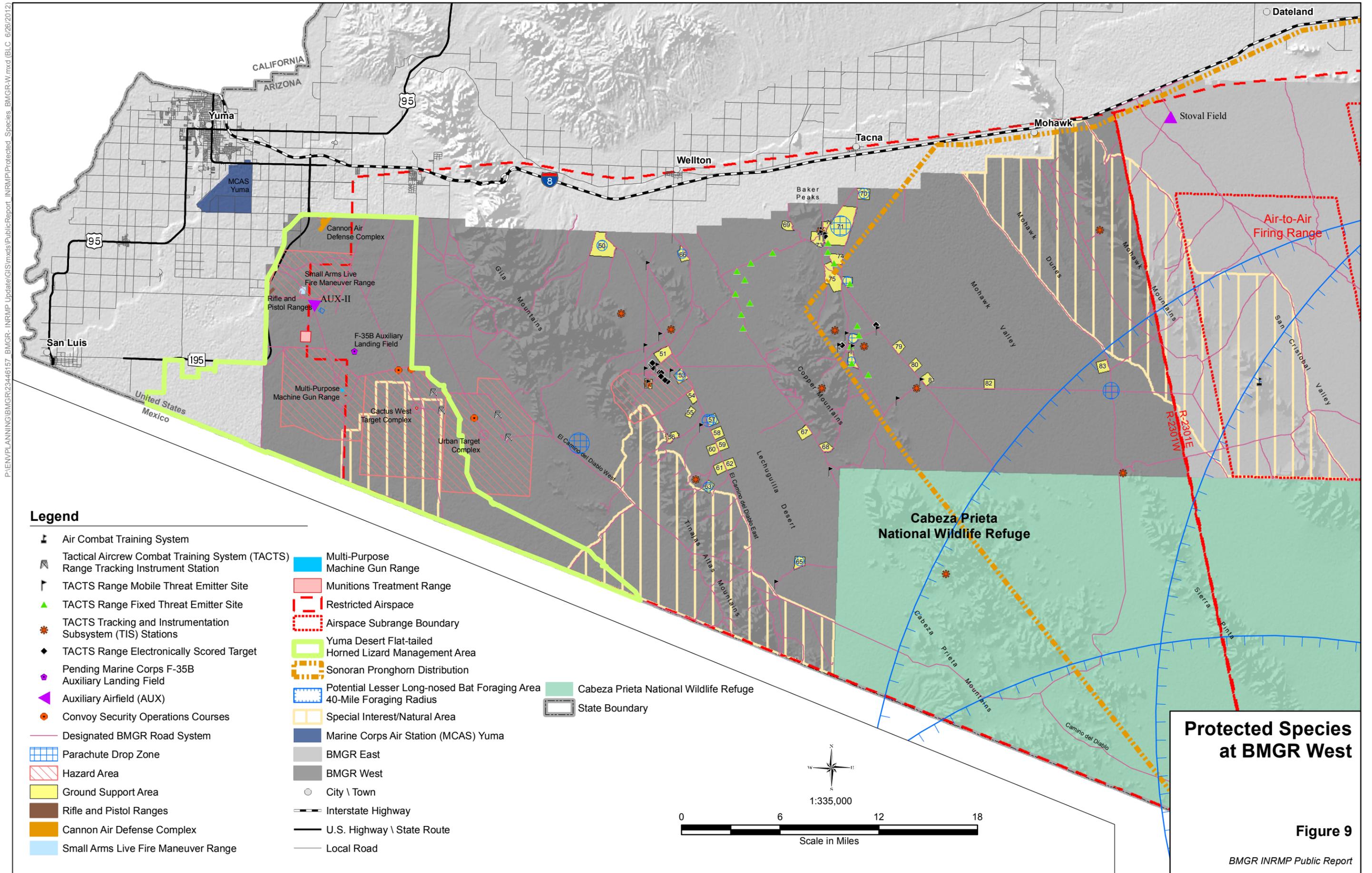
The current range of the Sonoran pronghorn includes portions of BMGR West (Figure 9) and BMGR East (Figure 10). The Air Force and Marine Corps continue to actively participate in and financially support the Sonoran Pronghorn Recovery Plan and the actions of the recovery team.

While methods and geographic study areas used to estimate the Sonoran pronghorn population have varied over time, estimates from 1925 through 1991 indicate that relatively low numbers of pronghorn (approximately 50 to 150 animals) have been present in southwestern Arizona, and that the area of distribution became smaller over the years. AGFD initiated regular biennial aerial surveys of the Sonoran pronghorn population in 1992 using standardized techniques. Based on these surveys, the peak for the U.S. population was estimated at 282 animals in 1994, and the population low was estimated at 21 to 33 animals in 2002. Population estimates in 2004 and 2006 were 58 and 68 pronghorn, respectively. The free roaming Sonoran pronghorn population in the United States was an estimated 100 animals in 2011.

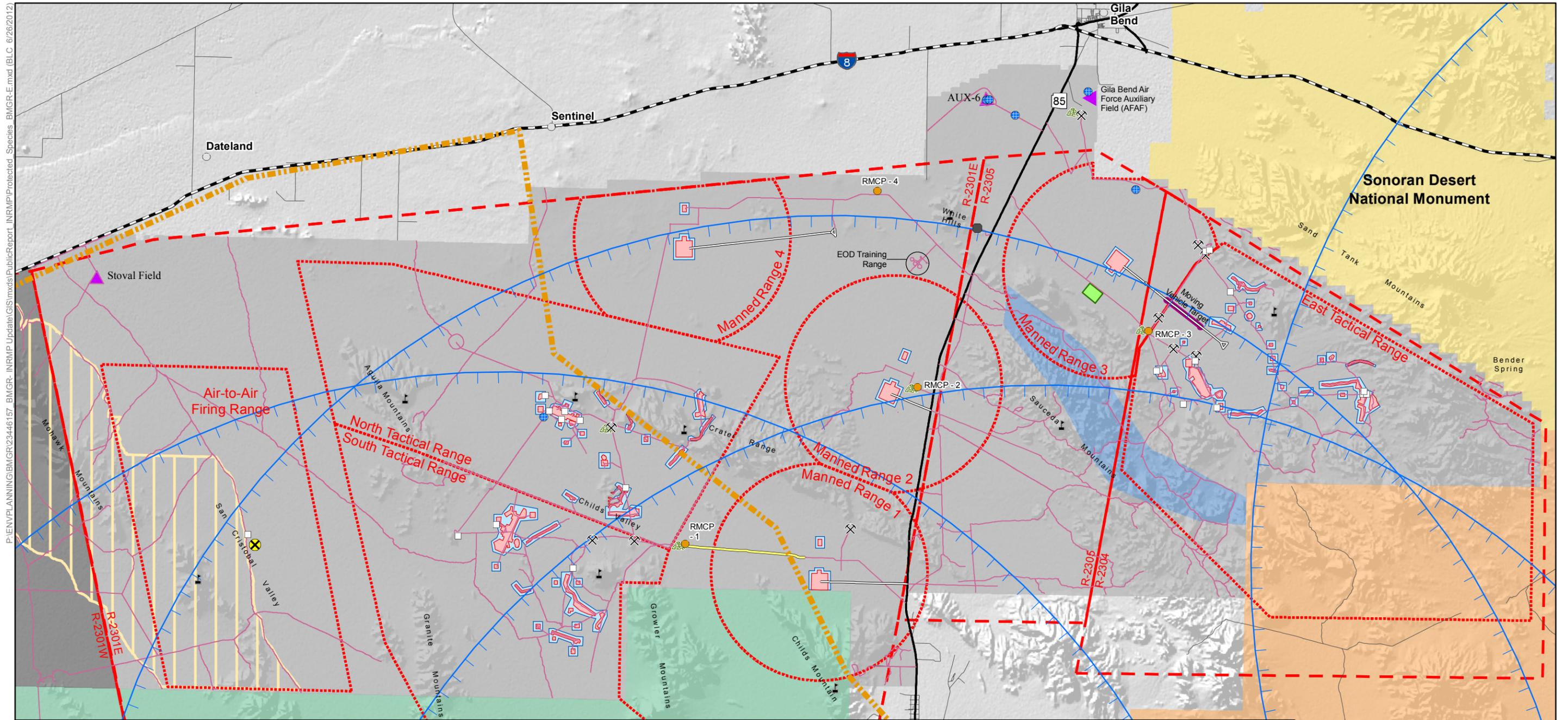


These Sonoran pronghorn fawns are being raised in the captive-breeding pen that was built at Cabeza Prieta NWR in 2003.

One of the key recovery actions for Sonoran pronghorn was the initiation of semi-captive breeding program for this species located at the Cabeza Prieta NWR. In the fall of 2003, a captive-breeding pen was built in the Cabeza Prieta NWR. The semi-captive breeding program was initiated in an effort to stabilize and increase the size of the populations in the U.S. and Mexico, increase the genetic diversity within both the U.S. and Mexican populations, and provide breeding stock for the establishment of additional populations within the United States. Sonoran pronghorn captured from wild and free roaming populations were placed in the pen beginning in January 2004. Over the next approximately four-and-one-half years, wild male and female Sonoran pronghorn both from Mexico and the United States were periodically added to the pen. Not all animals survived the relocation process, and the pen population has fluctuated due to births of fawns and removals for release within Cabeza Prieta NWR, as well as mortality in the pen (USFWS, 2010(a)). As of May 2011, the population of captive Sonoran pronghorn at the breeding facility was 70 animals (USFWS, 2011b).

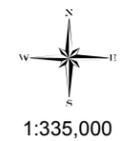


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Legend

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> Air Combat Training System Air Force Small Arms Range Range Munitions Consolidation Point (RMCP) Parachute Drop Zone Helicopter Landing Zone Sensor Training Area Site Sand and Gravel Extraction Sand and Gravel Stockpile Auxiliary Airfield (AUX) Lead-In-Line | <ul style="list-style-type: none"> Moving Vehicle Target Designated BMGR Road System Approved Paving of Existing Road Helicopter Gunnery Range Explosive Ordnance Disposal (EOD) 2-Year Clearance Area Explosive Ordnance Disposal (EOD) 10-Year Clearance Area Restricted Airspace Airspace Subrange Boundary | <ul style="list-style-type: none"> Conditional Public Access Area—Entry Permitted only with Prior Approval when East Tactical Range is Inactive Sonoran Pronghorn Distribution Potential Lesser Long-nosed Bat Foraging Area 40-Mile Foraging Radius Special Interest/Natural Area BMGR East BMGR West | <ul style="list-style-type: none"> City \ Town Interstate Highway U.S. Highway \ State Route Local Road Sonoran Desert National Monument Tohono O'odham Nation Cabeza Prieta National Wildlife Refuge |
|--|--|--|---|



1:335,000



Protected Species at BMGR East

Figure 10

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In February 2010, the USFWS proposed to reestablish the Sonoran pronghorn under Section 10(j) of the ESA, and to classify the reestablished population as a nonessential experimental population (NEP) (Federal Register, 2010(b)). The designation of a NEP provides for allowable legal incidental taking of the species within the defined NEP area. Under a Section 10(j) rule, the USFWS has much more leeway to take local concerns into account when preparing management strategies and thus can avert restrictions on current and future land uses and activities. An EA for the Sonoran Pronghorn Reintroduction and Final 10(j) Rule was prepared by the USFWS, and a Finding of No Significant Impact (FONSI) was signed on 19 April 2011 (USFWS, 2012). The approved action consists of two components: (1) construction and operation of a captive-breeding pen at Kofa NWR, and (2) relocation of some Sonoran pronghorn from the existing captive-breeding pen at Cabeza Prieta NWR to a new holding and release pen at BMGR East, which would be located in Area B. The 0.5 square mile captive breeding and release facility in King Valley within Kofa NWR were completed in December 2011. Twelve pronghorn (two bucks and ten does) from the captive breeding facility at the Cabeza Prieta NWR, which was constructed in 2003, were transferred to the captive breeding pen at Kofa NWR on 15 December 2011 (AGFD, 2012(b)). Environmental surveys of the proposed location for the holding and release pen in Area B have been completed; however, because use of the holding pen depends on strength of the U.S. Sonoran pronghorn population numbers, installation and use of the pen is currently projected to be initiated within the 2017-2022 timeframe. The USFWS has reported that potential release of Sonoran pronghorn into Area B would only occur after current recovery efforts produce strong results; such result are not anticipate for at least 5 years.

The AGFD distributes a monthly Sonoran pronghorn update, which summarizes the captive breeding program, wild pronghorn, water projects, forage enhancements, and other related pronghorn projects. The AGFD pronghorn update covers the entire U.S. pronghorn distribution, and certain aspects of the monthly update pertain to the BMGR.

3.6.4.2 Lesser Long-nosed Bat

The lesser long-nosed bat is migratory and found throughout its historical range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. Lesser long-nosed bat maternity colonies occupy caves and abandoned mine shafts in southwestern and south-central Arizona from about mid-April through late July or August. The lesser long-nosed bat forages but does not roost on the BMGR. Maternity roosts are located near the BMGR in the Cabeza Prieta NWR, Organ Pipe Cactus NM, and Tohono O’odham Nation (see Figure 9 and Figure 10).



Survey techniques such as acoustic monitoring, mist net traps, and roost assessments are used to monitor bats on the BMGR.

3.6.4.3 Flat-tailed Horned Lizard

The FTHL is a small horned lizard that inhabits creosote flats, sand dunes, and mud hills in southeastern California, southwestern Arizona, and northwestern Mexico. Much of the FTHL’s historic habitat (possibly as much as 50 percent) in the United States has been lost due to agricultural and residential development (Flat-tailed Horned Lizard Interagency Coordinating Committee (ICC), 2011). At this time, the majority of the FTHL’s range in Arizona is restricted to the Yuma Desert area within BMGR West (see Figure 9) (AGFD, 2009).



The Interagency Conservation Agreement has been a successful management approach for protecting the Flat-tailed Horned Lizard.

The proposed rule for listing the FTHL as threatened has been withdrawn and reinstated several times since it was first proposed in 1993. Most recently, in March 2011, the USFWS withdrew the proposed rule to list the FTHL because threats to the species identified in the 1993 rule were not as significant as earlier believed, and data do not indicate that the threats to the species and its habitat were likely to endanger the species in the foreseeable future (Federal Register, 2011).

The FTHL is managed in accordance with an Interagency Conservation Agreement and Flat-tailed Horned Lizard RMS to which the Marine Corps and AGFD are parties. The RMS was last updated in 2003. Five FTHL management areas, encompassing about 485,000 acres in aggregate, were established under the original RMS and retained by the 2003 RMS update.

The Yuma Desert Management Area includes about 114,800 acres of FTHL habitat in BMGR West. BMGR West provides almost 24 percent of the five management areas in aggregate. The 2007 BMGR INRMP management elements and prescriptions fully incorporate the RMS and provide the guidance for implementing the strategy. The INRMP also designates the portion of the Yuma Desert Management Area that is in BMGR West as the Yuma Desert Flat-tailed Horned Lizard Habitat Special Interest/Natural Area (see Figure 9).

To support training with the F-35B aircraft at the BMGR, the Department of the Navy has approved construction of an ALF in BMGR West (see Section 2.1 and Figure 3). In total, this project will affect about 255 acres of FTHL habitat. The environmental effects of the ALF were evaluated in an EIS (U.S. Department of the Navy, 2010) and an associated Biological Assessment. The USFWS reaffirmed its previous conference opinions that the proposed ALF and F-35B training operations at BMGR West would not be likely to jeopardize the continued existence of the flat-tailed horned lizard. (AESO/SE 22410-1995-0114-R006). During the past five years, MCAS Yuma has invested \$232,000 for FTHL surveys associated with the F-35B ALF project and \$233,000 for FTHL occupancy and demographic surveys. MCAS Yuma also has published a poster illustrating procedures for protecting FTHLs as part of its public education and outreach program.



Baseline surveys for the Flat-tailed Horned Lizard provide valuable information for the management of this species on BMGR.

3.6.4.4 BOs Issued for Actions at the BMGR 2007 -2012

Three BOs have been issued for actions at the BMGR since the 2007 INRMP was implemented. These BOs include:

- The USFWS issued a BO on the effects of the proposed West Coast Basing of the MV-22 tilt-rotor aircraft and MV-22 flight training operations at BMGR West in October 2009 (AESOS/SE 22410-1995—F-0114-R005). The USFWS found that the effects to the Sonoran pronghorn from the proposed flight training operations would not be greater than those of the CH-46 helicopter that the MV-22 will replace and that the action is not likely to jeopardize the continued existence of this species (USFWS, 2009). The USFWS also reaffirmed its earlier opinion that MV-22 operations would not likely to jeopardize the continued existence of the lesser long-nosed bat.

- The USFWS issued a BO on the effects of the proposed West Coast Basing of the F-35B aircraft and F-35B flight training operations at BMGR West in September 2010 (AESO/SE 22410-1995-0114-R006). The USFWS found that the project is not likely to jeopardize the continued existence of either the Sonoran pronghorn or the lesser long-nosed bat (USFWS, 2010(b). As already noted, the USFWS also reaffirmed its previous conference opinions that the proposed ALF and F-35B training operations at BMGR West would not be likely to jeopardize the continued existence of the FTHL.
- The USFWS issued a BO on the effects of ongoing operations and proposed enhancements of training and support infrastructure at BMGR East in May 2010 (AESO/SE 22410-1996-F-0094-R003). The USFWS found that the ongoing operations and proposed enhancements were not likely to jeopardize the continued existence of either the Sonoran pronghorn or the lesser long-nosed bat.

3.6.5 State of Arizona Wildlife Species of Special Concern

The State of Arizona also has identified a number of wildlife species of special concern to the state that are present or potentially present within the BMGR. The state list includes the aforementioned species. Other wildlife of special concern in Arizona present within the BMGR, and not previously discussed, include the California leaf-nosed bat (*Macrotus californicus*), and the Yuman Desert fringe-toed lizard (*Uma notata rufopunctata*). State listed plant species present on the range and not previously discussed include sand food (*Pholisma sonora*) (AGFD, 2012(b). State listed wildlife and plants of special concern may be locally abundant within a given area, but are in need of special management consideration to assure the continued survival and health of their statewide populations.

3.7 CULTURAL RESOURCES

3.7.1 Overview

The same factors that have helped to preserve the natural resources of the BMGR—exclusion of surface disturbing, non-military land uses and correspondingly limited land surface disturbance by military activities—have also helped to protect cultural resources. As a result, well-preserved cultural resources remain, providing a remarkable record that tells of thousands of years of human habitation and use of this region.

Federal law protects cultural resources that satisfy the government’s criteria for being listed on the National Register of Historic Places. Archaeologists, historians, Native Americans, and federal agencies, including the Air Force and Marine Corps, work with the Arizona State Historic Preservation Officer (SHPO) in Phoenix to decide which resources are eligible for listing. The Air Force and Marine Corps are responsible for protecting and managing the cultural resources within the BMGR in accordance with a suite of federal laws and regulations.

Cultural resource inventories conducted by the Air Force and Marine Corps prior to the 2007 INRMP, identified more than 1,200 archaeological sites and other cultural resource features. During the course of the INRMP planning process, certain gaps were identified in the availability of resource information that



Archaeological site stewards monitor highly visible cultural sites and document changes by comparing effects to baseline photography.

would be relevant to the management of cultural resources. As part of the 2007 INRMP planning process, more than 20 tribes were invited to participate in the development and implementation of the INRMP. One of the findings in the planning process was that less than a quarter of the BMGR had been systematically surveyed for cultural resources. Before implementing the 2007 INRMP, and to comply with Section 106 of the NHPA of 1966 and the Archaeological Resources Protection Act of 1979 (ARPA), the Air Force and Marine Corps entered into a programmatic agreement with the Arizona SHPO, several tribes, and the AGFD on 24 October 2005. The programmatic agreement covers actions described in the INRMP that do not require further analysis under NEPA, which include permitted public access. Resource management goals to develop a plan for determining the limits of acceptable change, and implement the provisions of the cultural resources programmatic agreement were identified.

3.7.2 Update

An ICRMP was implemented for the BMGR in 2009. The ICRMP provides guidance for managing cultural resources at the BMGR in accordance with the NHPA and other applicable law and regulation. The ICRMP addresses both BMGR West and BMGR East. Volume 1 addresses the issues common to both BMGR East and BMGR West—the physical setting, resource laws, culture history, and other landscape-scale elements. Volume 2 specifically addresses BMGR East and Volume 3 specifically addresses BMGR West.

3.7.2.1 BMGR West

The Marine Corps has completed cultural surveys and the associated final survey reports for the roads authorized in the 2007 INRMP and has started on other random area surveys. Since 2005, 60,000 acres have been surveyed for cultural resources, which resulted in the recording of 87 new sites. Additional activities at BMGR West include:

- Completed a Native American Cultural Affiliation Study
- Completed an Historic Mining Context Study
- Entered into an MOU with Arizona SHPO for “Section 106 Compliance Consultation Process for Negative Findings”
- Entered into an Memorandum of Agreement with MCAS Twentynine Palms, Curation for the curation of artifacts
- Entered into a programmatic agreement with the Arizona SHPO for the West Coast basing of the MV-22
- Maintained an annual Monitoring Plan involving a minimum of ten sites per year



Distinct pottery styles can help to date archaeological sites on the BMGR.

3.7.2.2 BMGR East

Archaeological surveys have been conducted in both military use zones and public access areas on BMGR East. The majority of the projects are related to military actions that require surveys of large contiguous areas. Surveys of military impact areas and 95 percent of the roads on the three tactical ranges have been completed. Surveys of nearly 40 percent of the roads in the public access area, the new pronghorn pen site, AGFD water catchments, and other small projects have been completed in the last

five years. Corridors along roads in areas open to the public, where impacts associated with permitted vehicle-based camping are likely, have been identified as high priorities for cultural resource surveys in accordance with the terms of the INRMP programmatic agreement. Since 2007, approximately 11,100 acres have been surveyed for cultural resources. Survey reports completed since 2007 include the following with the report date listed in parentheses; some of the reports were for surveys that were conducted in earlier years:

- ETAC 1999: Intensive Archaeological Survey of 2,900 Acres on the East Tactical Range (ETAC) (2008)
- NTAC 2002: Intensive Archaeological Survey of 5,594 Acres on the North Tactical Range (2007)
- ETAC 2002: Intensive Archaeological Survey of 2,296 Acres on the East Tactical Range (2007)
- NTAC 2003: Intensive Archaeological Survey of 2,009 Acres on the North Tactical Range (2008)
- STAC 2003: Intensive Archaeological Survey of 4,945 Acres on the South Tactical Range (2008)
- ETAC 2003: Intensive Archaeological Survey of 2,372 Acres on the East Tactical Range (2008)
- Intensive Archaeological Survey of 164 Acres for a Pronghorn Forage Plot in the Southern San Cristobal Valley (2009)
- NTAC 04: Intensive Archaeological Survey of 58.8 Miles of Roads and Assessment of 35 Sites on the North Tactical Range (2009)
- ETAC 2009: Intensive Archaeological Survey of 1,763 Acres on the East Tactical Range (2011)
- Area B Roads: Intensive Archaeological Survey of 62.5 Miles (2,516 Acres) in the Saucedo Mountains (2011)
- Stoval Road and Sensor Training Area: Intensive Archaeological Survey of 2,464 Acres in the San Cristobal Valley (2011)
- Stoval Airfield: Archaeological Survey of 1,639 Acres and Limited Testing in the San Cristobal Valley (2011)
- Area B Roads: Intensive Archaeological Survey of 15 Miles (595 Acres) (2011)
- Manned Range 3 and ETAC: Intensive Archaeological Survey of 1,948.32 Acres (2011)



Cultural survey of the BMGR continues with areas most used as the priority.

The Site Stewards program for the Western Papaguería currently has 30 certified members that are monitoring highly visible sites. This site steward program is one of the most active in Arizona. Highly visible sites may be visited daily or weekly and the stewards take repeat photography to compare with baseline photos taken over the past 15 years. Some site stewards have received additional training and are certified to assist with surveys and site recording when a professional archaeologist is present.

Every other year, the Air Education and Training Command (AETC) and other Air Force commands award an installation with the General Thomas D. White Environmental Award for excellence in their

cultural resource program. BMGR East received the award for AETC in 2009, and also received another General Thomas D. White Environmental Award for best cultural resource program in the Air Force.

BMGR East archaeologists also edited and wrote a book, *Fragile Patterns; The Archaeology of the Western Papageria*, that received an award as one of the top 12 books on the Southwest in 2008. The book was written for professionals and the public, and contains many reports on projects that the Air Force has completed in the past 15 years.

The NHPA and Air Force Instruction 32-7065, which codifies the NHPA for Air Force operations, require that artifacts be curated in perpetuity. In 2005, the Air Force completed a cost benefit analysis of storing artifacts at an approved curation facility, such as Arizona State Museum, or an Air Force facility. The analysis indicated that the Air Force would benefit, both in terms of cost savings and accessibility, from having a repository at Gila Bend AFAP. A building at Gila Bend AFAP was remodeled to National Archives Standards, and a portion of the building is the artifact repository. Access to the facility is by a separate entrance with a coded lock. This is reportedly the first repository that the Air Force has approved in the last 15 years.

3.8 PERIMETER LAND USE ENVIRONMENT

As was reported in the 2007 INRMP, existing land use on the perimeter of the BMGR continues to include communities, industry, range land for livestock grazing, agricultural land, Native American reservation land, BLM public land managed for multiple uses, Sonoran Desert National Monument, and Cabeza Prieta NWR. The largest communities near the BMGR identified in the 2007 INRMP are listed in Table 8, along with the 2000 and 2010 Census data.

Table 8. Comparison of Populations 2000-2010

City	2000 Census Data ¹	2010 Census Data ²
Yuma (City), Yuma County	77,515	91,179
Wellton, Yuma County	1,829	2,730
Tacna, Yuma County	555	389
Gila Bend, Maricopa County	1,980	1,922
Ajo, Pima County	3,705	3,206

SOURCES:

¹ BMGR INRMP, 2007

² 2010 Census Data. URL: <http://2010.census.gov/2010census/data/>

The majority of the human populations near the BMGR are located in Yuma County. The housing crash and recession that began in 2007 has dramatically reduced population and housing growth in Yuma County, to an annual growth rate between 2007 and 2009 of 0.3 percent. Whereas between 1980 and 2000 the average annual growth rate for Yuma County was 3.84 percent (Yuma County Department of Development Services, 2011).

Outside of the incorporated town of Gila Bend in Maricopa County, the human population is 1,069 in the Census Block Group located north of the BMGR (Tract 723305, Block Group 2). Approximately 5,259 people are located in the Census Block Group located east of the BMGR (Tract 723306, Block Group 1), but that block group is 894.5 square miles (Maricopa Association of Governments, 2010).

The existing industrial and commercial land uses in Yuma County are located in relation to the Interstate 8 (I-8) corridor, MCAS Yuma, and Mexico. Large industrial land uses near the range include the Gila Bend Regional Landfill (located north of Gila Bend on the east side of SR 85), Copper Mountain Landfill (near Wellton), automobile testing facility (south of Tacna), Gila Bend electrical substation (west of Gila Bend), and Gila and North Gila electrical substations (east of Yuma). There are several canals, transmission lines, and pipelines on the lands adjacent to the range. The 2,100-megawatt Panda Gila River Power Station is located north of Gila Bend on the west side of SR 85. The inactive Phelps Dodge Ajo Incorporated copper mine is located near Ajo.

Immediately south of MCAS Yuma, there is a large area designated Agriculture/Industrial primarily intended to allow continued agricultural uses, site built residences with noise attenuation, and aviation-compatible industrial uses (Yuma County Department of Development Services, 2011). Agricultural uses near the BMGR include irrigated cropland and orchards with the most common crops including citrus, cotton, vegetables, and small grains. Agricultural land uses are most common in the fringes of the Yuma metropolitan area, but are also located north of the western half of the BMGR along I-8 and near Gila Bend.

The Tohono O’odham Nation is located to the southeast of the BMGR. The Hicikiwan District is the nearest district, with an on-reservation population of 903, and off-reservation population of 829 (Tohono O’odham Nation, 2011). Other land use on the Tohono O’odham Nation is typically associated with ranching and the grazing of livestock, and may include seasonal cattle camps. In March 2010, the 56th Fighter Wing and the Tohono O’odham Nation signed an MOU to create a framework for consultation on DoD activities at BMGR East. The MOU formalizes the consultation process, but recognizes that the consultation process in connection with the INRMP and ICRMP are not included in the purview. The MOU was signed on 22 March 2010, and is in effect for five years.



The Cabeza Prieta NWR was part of the BMGR until 1999 and the overlying airspace continues to be used for aviation training.

Lands adjacent to the BMGR that offer the most recreational opportunity include the Sonoran Desert NM, Cabeza Prieta NWR, and Reserva de la Biosfera de El Pinacate y El Gran Desierto de Altar in Mexico. The Sonoran Desert NM is located along the northeast corner of the range near East TAC (see Figure 1); the portion of the monument adjacent to the range was formerly part of the BMGR, but was relinquished to the BLM with the passage of the MLWA of 1999. This area is currently being managed by the BLM for semi-primitive recreational opportunities and includes motorized access to some of the land. The Cabeza Prieta NWR and Wilderness is located along portions of the BMGR’s southern border (see Figure 1).

All of the areas in which recreation is most likely to occur are predominantly undeveloped desert. Most of the other non-agricultural areas are undeveloped desert, including the land in Mexico that is south of the BMGR boundary and much of the land north of the BMGR along I-8, particularly between Gila Bend and Mohawk.

3.9 RECREATION AND SPECIAL USES

3.9.1 Overview

Historically, recreation use of the BMGR occurred at relatively low levels in comparison to the nearby areas such as Organ Pipe Cactus NM and Imperial Sand Dunes Recreation Area. However, with population growth, particularly in communities near the range, recreation use of the BMGR has increased steadily in recent years. About 62 percent of the BMGR is regularly restricted from recreational access because of safety hazards presented by the military mission (see Figure 11 and Figure 12). Those areas of the BMGR that can generally accommodate public visitation on a regular basis as long as certain necessary restrictions are observed include Area B within BMGR East and most of the eastern portion of BMGR West. However, even these areas are sometimes unavailable to recreational users because some special training exercises require temporary closure to recreation use for safety and security purposes. In the areas generally unavailable for recreation use, some special use recreation is allowed when compatible with the military mission (for example, during bighorn sheep hunting season, hunter access may be granted, on a case-by-case basis, to areas normally closed to recreational access). Without exception, all BMGR recreation users are required to obtain an access permit for entry to the range.



Desert bighorn sheep populations on BMGR East have declined over the past 5 years, affecting hunting opportunities.

3.9.2 Update

Range entry permits help to account for the number of individuals visiting the BMGR, but the type of activities visitor engage in are not tracked. Range entry permits are issued for the period of 1 July to 30 June of the following year and are tracked by this reporting period. Table 9 provides the number of recreation permits that were issued during each reporting year:

Table 9. Range Entry Permits for BMGR 2006 - 2011

Reporting Year	Season of 2006-2007	Season of 2007-2008	Season of 2008-2009	Season of 2009-2010	Season of 2010-2011
Totals	5,332	7,190	8,069	8,515	8,533

From the reporting season of 2006-2007 to the 2010-2011 season, there has been a 62 percent increase in the number of recreation permits that have been issued.

While recreational activities are not formally tracked, range wardens and range management staff have observed some trends in use. Geocaching (which is described in Section 3.4.2.1) and OHV use have increased within BMGR West. There has also been an increase in the use of metal detectors, which is not allowed on the BMGR because of the safety hazards associated with subsurface ordnance. Currently, the user receives a warning on the first violation and a second violation results in seizure of the range access permit and may result in a trespass citation.

3.9.2.1 *BMGR West*

Hunting within BMGR West remains an approved recreational activity, although individuals must have a valid range access permit, a current Arizona hunting license issued by AGFD, and a proper tag/stamp for the specific species they are hunting. In addition to a valid hunting license, bighorn sheep hunters must also obtain a permit, or tag, to hunt that species. Bighorn sheep permits for BMGR West are split between the Gila Mountains, Tinajas Atlas Mountains, and a combination of the Mohawk and Copper mountains. Table 10 provides the number of permits issued for bighorn sheep by location for the period of 2007-2011.

Table 10. Hunting Permits Issued for Bighorn Sheep by Year within BMGR West

Mountain Range	Year				
	2007	2008	2009	2010	2011
Gila	2	2	2	2	2
Tinajas Atlas	2	2	2	2	2
Mohawk/ Copper	2	3	2	2	2
Totals	6	7	6	6	6

SOURCE: (Henry, 2012)

Requests for Special Use Permits are received from researchers seeking access to portions of BMGR West that are closed to public access, and any access permits to restricted areas require an on-line and in-person safety brief. In addition, research staff members are required to schedule their surveys and notify the Range Safety personnel when they enter and exit the BMGR West.

3.9.2.2 *BMGR East*

Hunting areas east of SR 85, including Area B, are within AGFD’s Game Management Unit (GMU) 40A. The distribution of desert bighorn sheep includes mountain ranges throughout GMU 40A; however, the unit has been closed to bighorn sheep hunting because the sheep population has declined significantly. AGFD is studying the possible reasons for the collapse of this population. A survey was conducted in 2010, but data from the survey are not yet available (AGFD, 2010(b)).



The BMGR includes rocky habitat for desert bighorn sheep.

Range management staff members working in BMGR East have noted that all-terrain vehicle activity may have increased slightly in the past five years. Compared to previous years, BMGR staff observed an increase in authorized use in the Area B Public Use Area, as well as unauthorized driving on administrative use only roads in the San Cristobal Valley.

Some camp sites are intensively used (such as, the nearly permanent hunt camp in Ryan's Canyon), but no discernible trend has developed over time. Also, during the late winter and early spring, especially in years of good wildflower blooms, there is a notable increase in passenger vehicle traffic on the road leading from SR 85 (Gate 9) to Hat Mountain, and the area north of Hat Mountain. Requests to enter the conditional public access area in Area B (see Figure 6) have not changed in number or nature in the past five years.

Year to year data on Special Use Permits are not retained, but in 2011 BMGR East issued 14 Special Use Permits, and this number is considered fairly representative of prior years. The Special Use Permits are primarily for scientific studies and the annual bighorn sheep permits. Most projects or studies on the range are scheduled to last more than a year with Air Force coordination being mandatory each time a team wants to access to the Range. Further, each member of the research team must undergo a background check prior to the permit being issued.

CHAPTER 4.0 BMGR ROAD SYSTEM AND PUBLIC ACCESS

The 2007 INRMP designated a road system within the BMGR that classified all inventoried roads at the range in one of three categories:

- roads open for administrative (i.e., government) and public use
- roads open for administrative use only
- roads closed to administrative and public use

Roads designated as closed were allowed to naturally recover. Closed roads remained available, however, for temporary and limited administrative reuse for high-priority and time-critical safety, law enforcement, or management purposes when no other access alternatives are available.

The 2007 INRMP designated 1,606 miles of existing roads as open to support military purposes, resource management activities, non-military agency actions, and public access. All public access to the BMGR continues to be by permit only. The publically accessible areas of the BMGR include approximately 678 miles of road that are usually open for public use. General public access is not allowed to the remaining about 72 percent of the BMGR where hazardous military activities or security requirements preclude public use. The 2007 INRMP also designated 616 miles of existing roads as closed to government or public use with a contingency for government reuse where necessary to support emerging military, management, or law enforcement requirements.

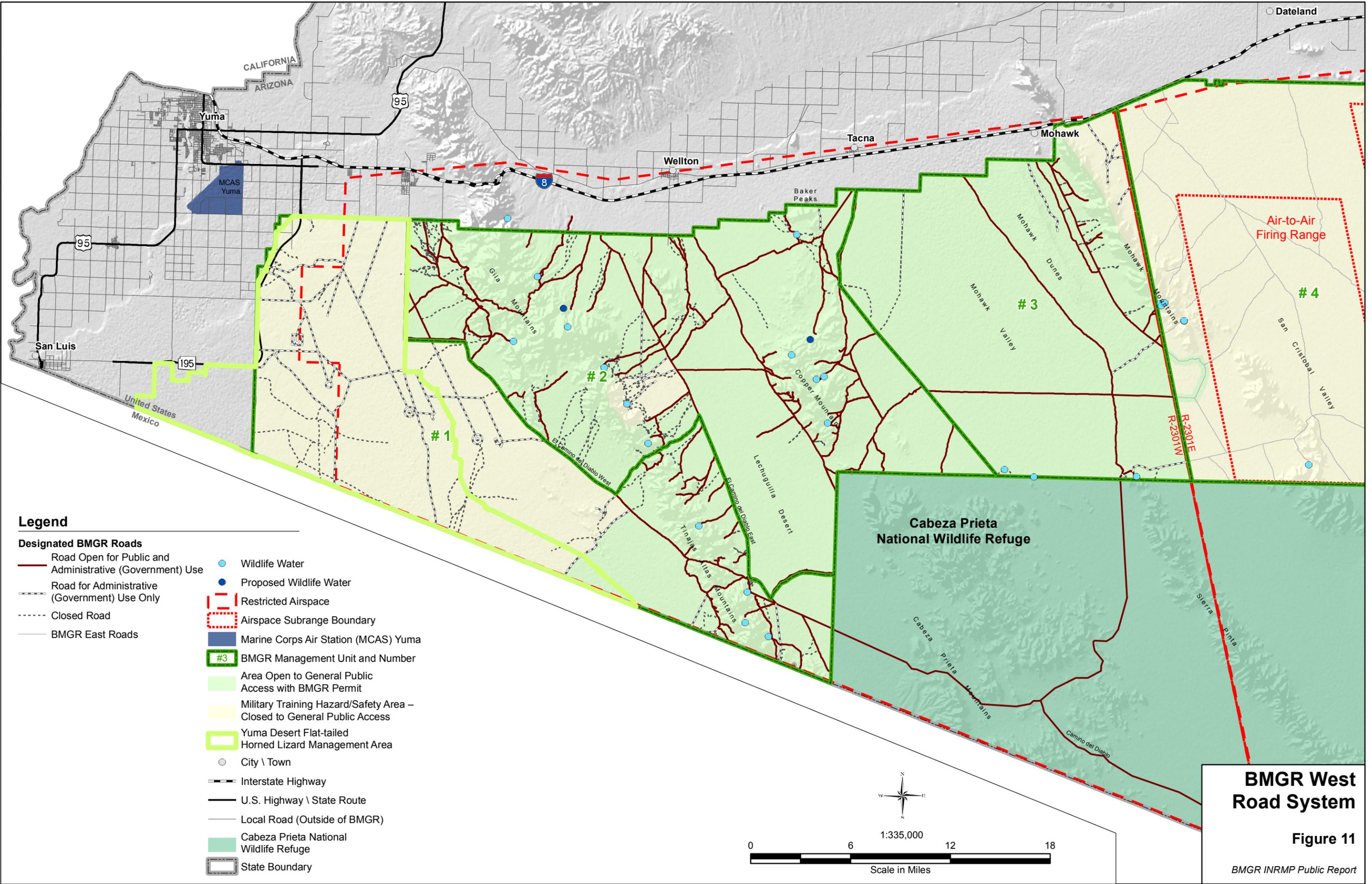
At the time of this Public Report, the designated road system and public access opportunities at the BMGR are mostly unchanged from 2007. However, findings from additional survey and continuing monitoring of the road system in the BMGR have prompted Luke AFB and MCAS Yuma to propose changing the classifications of some designated roads and adding some recently created roads to the designated road system to support military training, resource management, and Border Patrol law enforcement purposes. The current status of the BMGR road system and public access opportunities at BMGR West and BMGR East are addressed in the following sections.



Continuing survey and monitoring of the road network on BMGR is important to address changing needs for the military mission and public access to the range.

4.1 BMGR WEST ROAD SYSTEM AND PUBLIC ACCESS

The designated road system at BMGR West continues to function as documented in 2007 with no notable changes in the roads needed to support military activities. For the most part, public access roads remain the same with the exception of a slight decrease in access resulting from expanding the laser hazard area on the east side of the Gila Mountains (Figure 11). Additional hazard areas have been designated to the west of the Gila Mountains but public access to the affected areas has been restricted since well before the 2007 INRMP; consequently, this change has had no effect on public use opportunities at BMGR West.



Legend

- Designated BMGR Roads**
 - Road Open for Public and Administrative (Government) Use
 - Road for Administrative (Government) Use Only
 - Closed Road
 - BMGR East Roads
- Wildlife Water
- Proposed Wildlife Water
- Restricted Airspace
- Airspace Subrange Boundary
- Marine Corps Air Station (MCAS) Yuma
- #3 BMGR Management Unit and Number
- Area Open to General Public Access with BMGR Permit
- Military Training Hazard/Safety Area – Closed to General Public Access
- Yuma Desert Flat-tailed Horned Lizard Management Area
- City \ Town
- Interstate Highway
- U.S. Highway \ State Route
- Local Road (Outside of BMGR)
- Cabeza Prieta National Wildlife Refuge
- State Boundary

BMGR West Road System
Figure 11
 BMGR INRMP Public Report

The area of BMGR West available for general public access continues to include about 75 percent of BMGR West. All or portions of the public use area continues to be subject to occasional temporary closures to support military activities that present safety hazards and/or have security requirements. A portion of BMGR West located to the east of the Copper Mountains is subject to a seasonal closure each year—generally from 15 March to 15 July—to minimize disturbances during the pronghorn fawning season when does and their fawns are most vulnerable. The Sonoran Pronghorn Recovery Team determines the onset of the seasonal closure based upon rainfall and resulting forage conditions available for this endangered species.

As already noted, all visitors are required to obtain a BMGR Visitor’s Permit, which is valid from 1 July to 30 June of the following year. BMGR West visitors are not required to view the Air Force Visitor Safety Video that is compulsory for visitors prior to entering BMGR East.

The active road system documented in the 2007 INRMP for BMGR West included a total of 665 miles of active roads which included 490 miles of public access roads (Table 11 and see Figure 11). An additional 353 miles of roads were designated as closed in the 2012 data. The 2007 INRMP identified the potential development of two new bypass roads along the BMGR West – Cabeza Prieta NWR boundary. These proposed roads would provide the Border Patrol with a means of patrolling the area without having access to closed roads with the Cabeza Prieta Wilderness Area. These bypass roads were not constructed because their development was not pursued by the Board Patrol or USFWS.

Table 11. Designated Road System at BMGR West in 2007 and 2012

Road Category	2007	2012
Miles of roads classified for administrative use only inside military hazard/security areas that are restricted from general public access	136	159
Miles of roads classified for administrative use only outside of restricted military hazard/security areas	39	36
Miles of roads classified for administrative or public use outside of restricted military hazard/security areas but subject to temporary closure for military purposes	490	427
Total miles of roads	665	622

4.2 BMGR EAST ROAD SYSTEM AND PUBLIC ACCESS

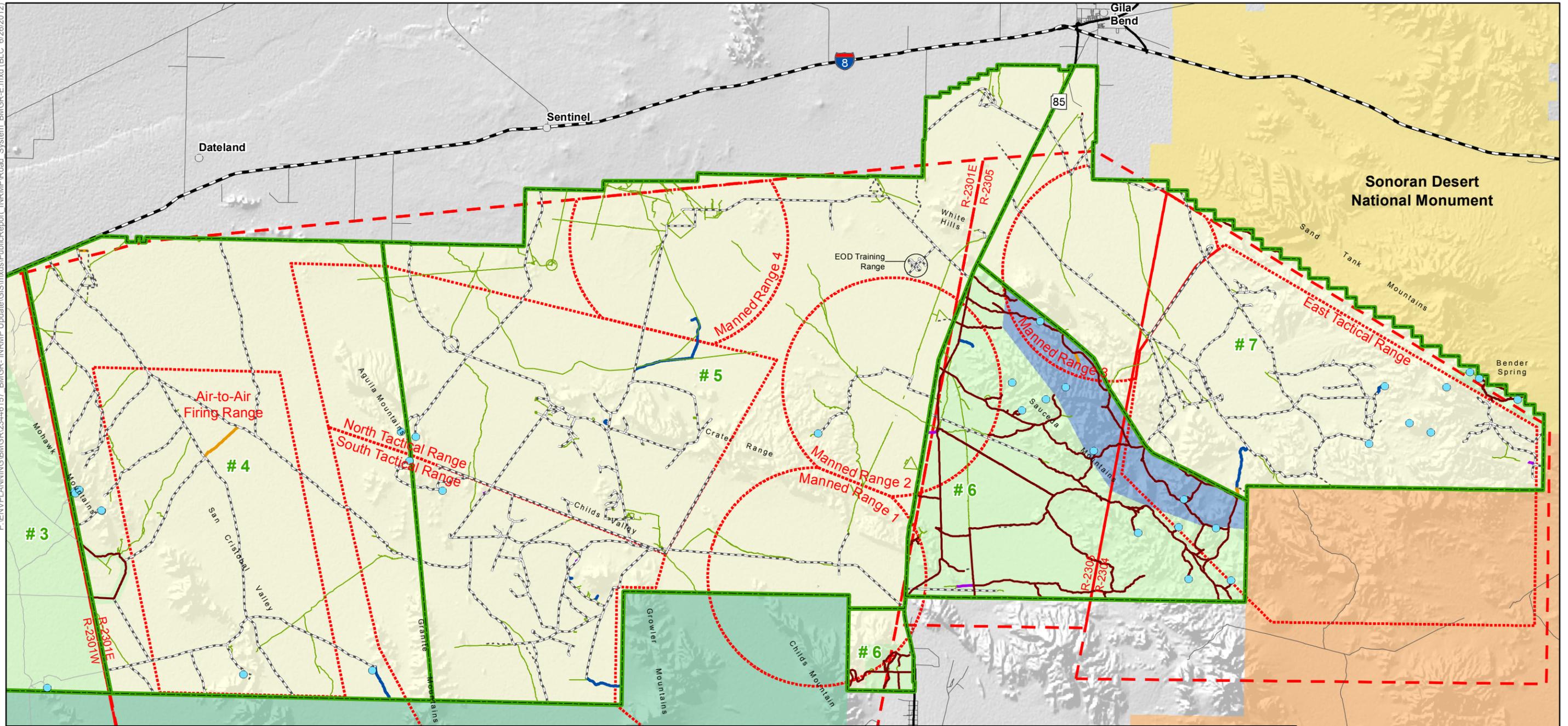
The active road system provided by the 2007 INRMP for BMGR East included a total of 941 miles of roads of which 188 miles were designated as available to provide public access (Table 12 and see Figure 12). An additional 351 miles of roads that were closed in 2007 have revegetated or otherwise recovered to the point that they are no longer passable or distinguishable as former roads and were designated as fully closed in the 2012 data. Because extensive areas of BMGR East continue to be used on a regular basis for hazardous military activities, general public access continues to be limited to less than about 13 percent of the range located in Management Unit 6 (see Figure 12). Public access to Management Unit 6 (also known as Area B) is subject, however, to temporary closures as needed for military purposes. Areas currently open to the public also may be closed to protect vulnerable natural or cultural resources from damage.

Table 12. Designated Road System at BMGR East in 2007 and 2012

Road Category	2007	2012
Miles of roads classified for administrative use only inside military hazard/security areas that are restricted from general public access	741	547
Miles of roads classified for administrative or public use inside military hazard/security areas that are restricted from general public access	0	5
Miles of roads classified for administrative use only outside of restricted military hazard/security areas	12	11
Miles of roads classified for administrative or public use outside of restricted military hazard/security areas but subject to temporary closure for military purposes	188	170
Total miles of roads	941	733

As already indicated, additional survey and monitoring of roads in BMGR East have led the Air Force to propose (see Figure 12):

- Establishing an additional classification for closed roads that have either substantially revegetated or otherwise naturally recovered and can no longer be either reliably recognized or followed along major portions of their length. In some cases, revegetation, erosion, and/or sedimentation have made segments of these roads impassable. The proposed fully closed category would differ from the closed category in that fully closed roads would no longer be depicted on range maps and would not be recognized candidates for time-critical safety, law enforcement, or management purposes. Approximately 92 percent of the 381 miles of closed roads in BMGR East are proposed to be reclassified as fully closed. No roads currently available for motorized vehicle access by the public would be affected by the proposed action.
- Reclassifying about 4.6 miles of closed roads in BMGR East as available for administrative use only. The affected road segments are needed to support military training activities, monitoring and maintenance of existing wildlife waters, and Border Patrol operations. The Border Patrol is already using some of the affected segments in accordance with authority provided to that agency. No roads currently available for motorized vehicle access by the public would be affected by the proposed action.
- Reclassifying about 2.4 miles of road currently open for administrative or public use as closed. The affected east-west road segment is in Area B just north of the lead-in-line to Manned Range 1. This segment leads to a dead-end, but is used by some visitors to connect to a closed road that links the segment to the Range 1 lead-in-line, which is limited to administrative use. Closure of the 0.9-mile segment would help to limit unauthorized use of the lead-in-line, but would not affect either public access to Area B or travel circulation within Area B.



Legend

- | | | | |
|---|--|--|----------------------------------|
| Designated BMGR Roads | Wildlife Water | Restricted Airspace | City \ Town |
| Road Open for Public and Administrative (Government) Use | Airspace Subrange Boundary | BMGR Management Unit and Number | Interstate Highway |
| Road for Administrative (Government) Use Only | Area Open to General Public Access with BMGR Permit | Military Training Hazard/Safety Area – Closed to General Public Access | U.S. Highway \ State Route |
| Closed Road | Conditional Public Access Area—Entry Permitted only with Prior Approval when East Tactical Range is Inactive | Tohono O'odham Nation | Local Road (Outside BMGR) |
| BMGR West Road | | Cabeza Prieta National Wildlife Refuge | Sonoran Desert National Monument |
| Proposed Changes to the BMGR Designated Road System | | | |
| Naturally Re-vegetating/Recovering Closed Road to be Reclassified as Fully Closed | | | |
| Re-designate 2007 Closed Road as a Road for Administrative (Government) Use Only | | | |
| Re-designate 2007 Road for Administrative or Administrative/Public Use as a Closed Road | | | |
| Add Unauthorized Route for Administrative (Government) Use Only | | | |



Tohono O'odham Nation

BMGR East Road System

Figure 12

- Adding about 15.2 miles of new roads to the designated road system. The added road segments would be classified as available for administrative use only and would be used for military training, wildlife management including recovery of the Sonoran pronghorn, and Border Patrol operations. The proposed additions to the designated road system were created during Sonoran pronghorn recovery activities or other wildlife management operations—such as the placement of emergency water and forage or construction of permanent wildlife waters, as a result of illegal UDI and drug smuggler traffic and necessary Border Patrol law enforcement responses to the designated road network, or during historic military activities. No roads currently available for motorized vehicle access by the public would be affected by the proposed action.

The Air Force has changed the terminology used to describe the classification of roads within the almost 87 percent of BMGR East that is used for military training and hazard/safety areas and is not open to general public access. The 2007 INRMP designated roads in these areas as open but unavailable for public access as a result of the area closures. These roads are now classified as available for administrative use only to provide consistency with the terminology used to refer to the limitations placed on the use of roads elsewhere in the range that are restricted from public use. This is a change in technical terminology that does not change the public access opportunities provided by the 2007 INRMP.

Finally, since 2007, surveys along approved roads in Area B have identified numerous archaeological sites. Based on the information provided in survey reports, and in accordance with the stipulations of the INRMP programmatic agreement, the Air Force and consulting parties have determined that 39 newly recorded sites are eligible for inclusion on the National Register of Historic Places. The agreement requires the Air Force to continue consultation with the parties to develop measures to avoid, minimize, or mitigate adverse effects on eligible properties to the fullest extent possible. As specified in the programmatic agreement and ICRMP, closing roads and restricting public access are among the measures that must be considered in developing historic property treatment strategies (see BMGR ICRMP, pp. I-33 and II-50). Implementation of these measures may result in changes to the approved road network in Area B and elsewhere on the BMGR East which may have a limited effect on public access opportunities.

CHAPTER 5.0 SUMMARY OF NATURAL AND CULTURAL RESOURCES MANAGEMENT EFFORTS SINCE THE MOST RECENT REPORT

5.1 STATUS OF 2007 ACTION STEPS

The 2007 BGMR INRMP addressed 17 management elements and included various management prescriptions for each element. These selected management elements and prescriptions provided the framework for managing the BMGR through 2024. However, these prescriptions cannot all be implemented simultaneously as there are budget, personnel, and other resource limitations. In addition, both the BMGR ecosystem and the military operations conducted there are dynamic. Consequently, management processes have been adapted based on natural and cultural resource inventory and monitoring data together with changing land use needs.

To keep the implementation process manageable and to tie it to regular DoD funding cycles, the INRMP identified those projects or action steps to be implemented within the first five years of the plan. The INRMP was reviewed annually to track progress and this five-year review provides a more in-depth review of the progress made, as well as the need for adjustments, and a list of projects or action steps for the next five-year period. The list of action steps for the next five years will be addressed in the second report associated with the INRMP update.

Appendices A and B provide two comprehensive tables describing the specific action steps from the 2007 INRMP and the status of those activities for BMGR West and BMGR East, respectively. Table 13 offers the percentage of the 17 management elements, and the general status of the action steps identified in the 2007 BMGR INRMP. The status in the table is shown as “C” for completed, “O” for ongoing and expected to continue, “I” for initiated but incomplete, and “N” for not initiated. Projects that are ongoing and expected to continue are generally long-term actions, such as conducting additional cultural inventories and environmental inventories to monitor the environment for change. Of the action steps not initiated, generally either the need did not materialize as had been anticipated or no funding was available. Appendices A and B provide updates on the status for each action item, and provide explanations on action items that were not initiated.

It should be noted that BMGR West has significantly more action items listed than BMGR East. Most of these items pertained to hunting and recreational uses. Recreation and hunting opportunities are limited primarily to Area B within BMGR East and therefore there are fewer action items associated with these activities in the plan for BMGR East compared to BMGR West.



The Air Force and Marine Corps initiated many management elements and prescriptions from the 2007 BMGR INRMP related to the Sonoran Pronghorn Recovery Plan.

Table 13. BMGR Summary of Progress on Project Action Steps

Management Element	Location	Number of Action Items	Status of Action Steps*			
			C	O	I	N
Totals	BMGR West	68	22%	40%	16%	22%
	BMGR East	38	13%	42%	16%	29%

*Status:

- C = Completed
- O = Ongoing and Expect to continue
- I = Initiated but Incomplete
- N = Not initiated

5.2 PROJECT HIGHLIGHTS

While Appendices A and B demonstrate that the Marine Corps and Air Force have complied with the directives in the 2007 INRMP, the following descriptions offer a more in-depth summary to highlight some of the resource management actions that have been taken in the past five years.

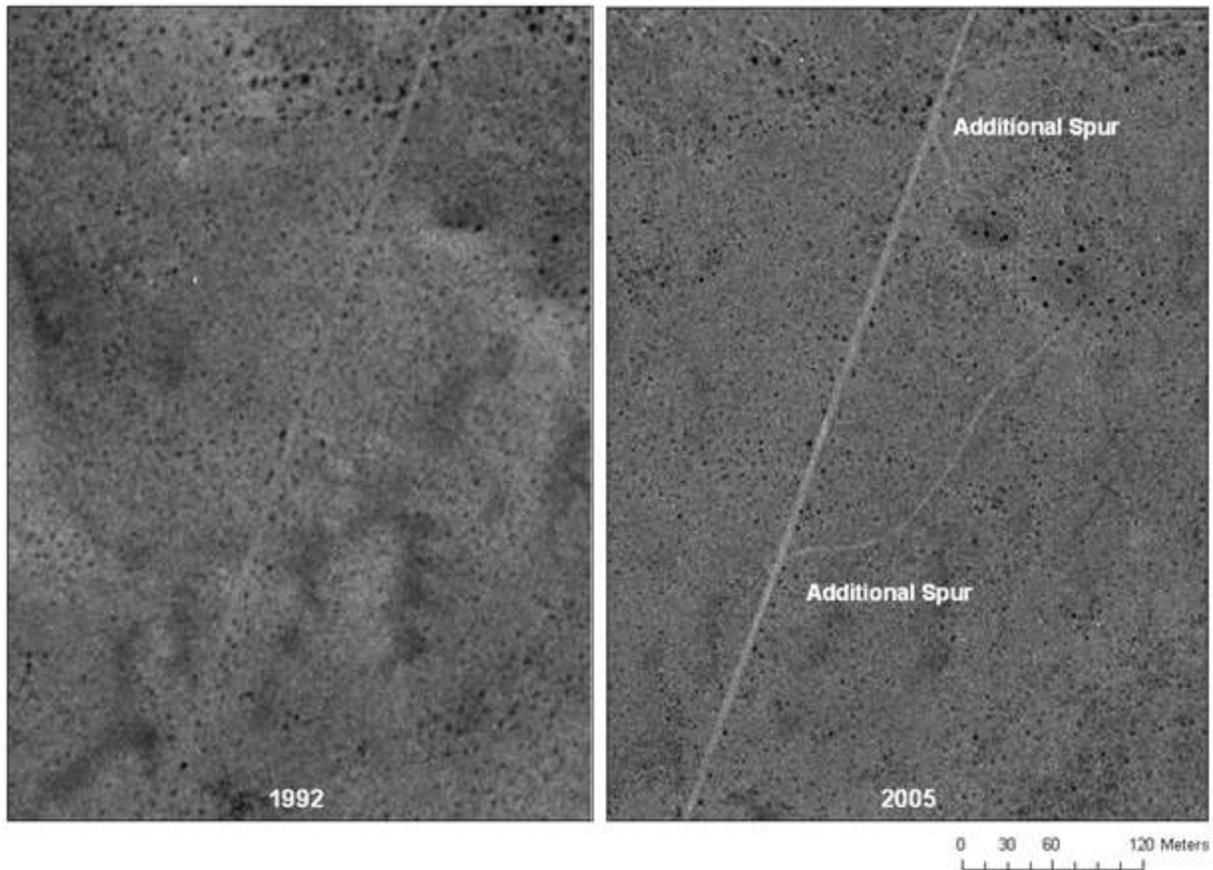
5.2.1 BMGR West

5.2.1.1 *Anthropogenic Impacts Study*

In September 2011, MCAS Yuma partnered with the University of Arizona to conduct a rangewide land change study that is expected to last through December 2012. Anthropogenic (human-caused) impacts related to transportation corridors and visitor use were identified as the highest monitoring priority by stakeholders and resource experts involved in developing the BMGR West Inventory and Monitoring Plan. Of particular interest to range management are the impacts to soil resources resulting from vehicular and pedestrian traffic, be it from recreational OHV, Marine Corps training activities, or illegal border crossing and Border Patrol interdiction. Vehicle-based activities in particular can directly impact soils, vegetation and local hydrology (Brooks, M.L. and B.M. Lair, 2009). Heavy foot and vehicular traffic can impact forbs and grasses (dune species may be especially vulnerable), and can disturb desert pavements and cryptogamic crusts, producing negative biological (and aesthetic) effects (Kruss, F.R. and J.M. Morgan III, 1986). Research on land use impacts in the Mojave Desert indicate that soils and vegetation may take decades to centuries to fully recover from anthropogenic disturbances (Lovich, J.E. and D. Bainbridge, 1999).

In 2009, MCAS Yuma contracted an aerial photography and photogrammetry company to collect 1-foot resolution aerial photography (color and infrared) and elevation data (2-foot contour maps using light detection and ranging [LiDAR] technology) for BMGR West. These data were then digitized to develop planimetric maps that included road networks.

These datasets will provide a geospatial background with which to inventory, assess, and analyze existing and potential impacts of anthropogenic activities on the natural and cultural resources of BMGR West using remote sensing image processing techniques and Geographic Information Systems technology. In addition, the project will use historical map transportation networks using 1992 and 1996 high-resolution aerial imagery (U.S. Geological Survey Digital Ortho Quarter Quads) in order to identify areas of BMGR West with high levels of use and disturbance between 1992 and 2009.



Multi-temporal aerial photography can be used to identify areas where transportation activities are increasing or changing over time.

The Marine Corps retained researchers at the University of Arizona for the study and they are currently in the process of mapping a complete inventory of roads and disturbances using the 2009 high-resolution aerial photography. The pilot (initial) program involved selecting a sub-set area and collecting the disturbance data from the photography. Erosion modeling was used for verification. The pilot program was successful, and the University of Arizona is in the process of completing a universal soil loss equation model, using the roads and other disturbed areas. Potential disturbance areas within BMGR West are being mapped.

The project will ground-verify the digitized transportation network map to provide an estimate of map accuracy (both categorical and spatial). Field verification will be conducted using multiple randomly assigned transects (0.3-0.6 mile or 0.5-1 km length) running perpendicular to the majority of mapped roads and trails. With a final digitized network of roads and trails from 1990s and 2009, the project will use change detection and geostatistical analysis to model “hotspots” on the range where continued or increasing anthropogenic activities might impact vulnerable soil types and potentially alter the natural flow pattern. The type, number, length, width, and other characteristics of road and trail networks will be mapped and quantified. Standardized mapping protocols will be documented to allow for periodic map updates (5-10 year intervals) and multi-temporal change analysis.

The final report will provide critical baseline information for resource managers pursuing adaptive management solutions to anthropogenic activities and establishing future monitoring locations of other BMGR West resource concerns (invasive species monitoring, soils and erosion monitoring, hydrologic monitoring, etc.), and provide baseline information for resource managers pursuing adaptive management solutions to anthropogenic activities.

5.2.2 BMGR East

As documented elsewhere in this report (such as the cultural resource programs described in Section 3.7.2.2), numerous actions have been taken in the past five years and are listed in Appendix B for BMGR East. The following program descriptions offer a more in-depth summary to highlight some of these resource management actions.

5.2.2.1 *Avian Studies Program*

Avian studies have been conducted at BMGR East. Currently, no federally listed bird species regularly occur at BMGR East. Therefore, in accordance with the avian conservation and management philosophies of the DoD Partners In Flight and other advisory entities, the BMGR East avian studies program emphasizes:

- Improving knowledge of species-at-risk at BMGR East and the surrounding region;
- Long-term, landscape-scale monitoring of the breeding bird community; and
- BASH.

Several avian species-at-risk occur on the BMGR. Of these, the Le Conte's thrasher (*Toxostoma lecontei*), a year-round resident of the lowland creosote desert, and gray vireo (*Vireo vicinior*), a winter resident of the Elephant Tree (*Bursera microphylla*)-Limberbush (*Jatropha* spp) natural community, have been prioritized for study. Since 2007, the 56 RMO at Luke AFB has been the leader in the research of these two bird species in Arizona.

Surveys for Le Conte's thrashers have been conducted on much of BMGR with the help of AGFD and Audubon Arizona's Important Bird Areas program. The knowledge about the distribution and ecology of these species gained from the surveys provides for informed range management decisions. Additionally, in early 2010, the 56 RMO, in cooperation with AGFD and USFWS-Sonoran Joint Venture, hosted a successful three-day workshop in Gila Bend and at BMGR East on Sonoran Desert bird ecology, and provided field training for conducting Le Conte's thrasher surveys. As a result of this workshop, the continual engagement with regional partners, and broad-scale surveys and research, BMGR East has made significant contributions to the knowledge of and management interest in this at-risk species.

The gray vireo winter distribution closely mirrors the distribution of elephant tree, which is a small tree that produces calorie-rich fruits fed upon by the vireo and other species. Since 2009, the 56 RMO has worked with a number of partners to map the distribution of elephant tree throughout Arizona, focusing on BMGR West and the outer periphery of the tree's range, and have conducted surveys for gray vireos where elephant tree occurs. These efforts, along with two successful field expeditions sponsored by Arizona field ornithologists, have led to several new discoveries about the winter range of the vireo and

its association with elephant tree in Arizona. As a result, Arizona's natural resource management community is more engaged with conservation and management of these species.

For several years, a breeding bird community monitoring project was conducted at BMGR East. Though these surveys contributed significantly to the knowledge of the distribution and ecology of BMGR's breeding birds, several deficiencies and shortcomings with the overall strategy were noted. In 2010, the 56 RMO began working with regional partners (particularly AGFD, Arizona Bird Conservation Initiative, USFWS, and USGS) to improve upon the survey efforts. This partnership resulted in a long-term breeding bird monitoring strategy that is being implemented in 2012 across the entire Sonoran Desert in Arizona. The 56 RMO is proud to have led the way in the design and implementation of this ambitious broad-scale monitoring effort.

In February 2011, the DoD issued a manual (DoD M 4715.03-M) with procedures to prepare, review, update and implement INRMPs in compliance with the Sikes Act. One of the provisions in the manual is that "all military installations with known populations of eagles and birds of prey shall implement [Aviation Protection Plan] (APP) guidelines, to the extent feasible and appropriate." An APP is essentially a plan to mitigate against the risk of birds of prey colliding with or being electrocuted by electric utility facilities. While electrical utility facilities are limited within the BMGR, the need for and development of an APP will be considered as an action step for the updated INRMP.

5.2.2.2 Buffelgrass Monitoring Program

In January 2010, the 56 RMO initiated a baseline project to monitor the expansion of buffelgrass along the east and west rights-of-way of SR 85 within BMGR East. This project will provide data to determine the potential for buffelgrass to extend laterally from the highway onto BMGR East. Using a highly precise Trimble GPS receiver, all mature buffelgrass as individual plants or as areas where stands were too dense to count individual plants were inventoried and mapped. A mature plant was defined as one that was either greater than 10 cm in height or seed-bearing. In addition to rights-of-way, buffelgrass stands that extended inside the BMGR East fence line at two places were also mapped. On Manned Range 2, buffelgrass extended approximately 400 m west of the fence along and within a wash. The second area was south of the Crater Range where buffelgrass had expanded eastward onto Area B along and within several small drainages. Mapping was repeated in October 2011 and will continue each autumn after the annual monsoonal rains for at least three more years.



Weather station data will help to evaluate the effects of climate on buffelgrass expansion.

Additionally, the 56 RMO installed an Onset weather station at the north end, center, and south end of the study area to record daily rainfall and temperature; plastic rain gauges were installed every 2 miles between the weather stations. The data will allow the 56 RMO to evaluate the effects of climate on buffelgrass expansion.

5.2.2.3 Weather Monitoring Program

In 2008, a network of eight Onset weather stations was installed across BMGR East to measure temperature and rainfall. Data from these stations are manually collected approximately every six months and are being compiled into a database for analysis.

In the fall of 2011, 10 research grade Campbell Scientific weather stations were installed to measure temperature, rainfall, relative humidity, wind speed and direction, soil moisture, and solar radiation. These 10 stations transmit their data real time via radio to the 56 RMO at Luke AFB. The data from these stations will provide information to make real time management decisions on a variety of issues, including the timing of invasive weed control and the response to climatic stresses on critical species. During this same time period, the Marine Corps installed five similar stations on BMGR West, and options are being explored to tie similar weather stations on Cabeza Prieta NWR into the network. Combining the information from these stations on neighboring land (in addition to nearby National Oceanic and Atmospheric Administration stations) will provide a more robust picture of the climate across the broader region.

Following the installation of the 10 Campbell stations, 14 Onsets weather stations (including the 8 original Onsets) were deployed across BMGR East to fill in “gaps” between the transmitting stations. The goal of these stations is to provide additional data for spatial interpolation of rainfall and temperature.

In early 2010, a network of 18 rain gauges was installed every 2 miles along SR 85. While these were set out primarily to provide data related to buffelgrass monitoring, they also provide a spatially explicit north-south gradient of rainfall. In January 2012, a similar array of 18 rain gauges was installed at 2-mile intervals east to west across the south-central part of BMGR East (from the eastern edge of the Range 1 lead-in line in Area B, through Range 1, and through STAC to Red Point). This array will provide an informative east/west gradient of rainfall. A layer of mineral oil is placed in each rain gauge to minimize evaporation.

5.2.2.4 Remote Camera Wildlife Monitoring Program

In May 2008, several camera traps were installed to record the presence of wildlife species utilizing artificial catchments as well as modified tinajas dispersed across BMGR East. The use of camera traps serves multiple purposes such as identifying individual species, assessing population size, and collecting information about various aspects of a species ecology and behavior. Data for this study were collected from May to November to incorporate the hottest and driest time of year. Camera traps were typically visited once per month to replace batteries, exchange media cards, and to ensure the equipment was intact and operational. To aid in photographic data analysis, a camera trap data structure helped enable all images to be relabeled, organized, stored, and analyzed without entering data by hand. Location detection rates, species richness, species accumulation curve, and species activity patterns are some of the parameters the analysis program can calculate and quantify. MCAS Yuma has installed similar camera traps to photograph wildlife in BMGR West.

CHAPTER 6.0 SUMMARY OF ENVIRONMENTAL REMEDIATION ACTIVITIES SINCE THE MOST RECENT REPORT

This chapter offers a brief overview of the handling and treatment of hazardous materials, and hazardous and solid waste at the BMGR to provide an understanding of the types of materials used to support the military mission, and a summary of the associated mitigation measures that are routinely employed. This is followed by an update of out of routine remediation actions that have occurred within BMGR West and BMGR East since the 2007 INRMP report.

6.1 HAZARDOUS MATERIALS

Hazardous materials are substances with strong chemical and/or physical properties, which may pose a substantial threat to human health and the environment. Use of hazardous materials on the BMGR to support the military mission includes petroleum, oils, and lubricants (POLs) such as fuel, hydraulic fluids, etc.). To a lesser extent, target maintenance activities also require hazardous materials (for example, paint).

Latex paints are used in dispersed locations throughout the BMGR for construction and repair of simulated targets. POLs are used to power and maintain vehicles and portable generators in the target ranges and ground support areas throughout the BMGR during troop deployment and range maintenance and clearance activities. Temporary containment aprons made of high-density sheeting and sandbags are placed beneath parked vehicles, supply drums, temporary aboveground storage tanks, fuel tankers, vehicles being fueled, and other stationary equipment that may leak fuels or lubricants. When soiled, the aprons are placed in secure containers, transported off-range, and handled/treated/disposed of as solid waste in accordance with applicable rules and regulations.

Recreational users of the BMGR also use an unknown amount of POLs to power their vehicles and other motorized equipment.

6.2 HAZARDOUS AND SOLID WASTES

Hazardous wastes are products or by-products of hazardous materials. In order to be classified as hazardous, wastes must either appear on a series of lists compiled by the U.S. Environmental Protection Agency or have the characteristics of being flammable, corrosive, reactive, or toxic.

The potential areas for both hazardous and non-hazardous waste generation on the BMGR are parallel to locations where hazardous materials are used. In addition, military aircraft mishaps or the downing of an aircraft, will typically generate hazardous wastes. The protocol for responding to an aircraft mishap includes multiple considerations for hazardous materials and waste management at the mishap site to include an estimate of the environmental damage to the site as compared to the derived benefits from the removal operation or site mitigation measures.

At the Gila Bend AFAF, low concentrations of hazardous wastes may be processed in the wastewater treatment lagoons and septic systems. These sites are monitored in accordance with applicable regulations to ensure that undue amounts of hazardous wastes are not released into the environment.

Solid wastes include garbage; refuse; sludge (from a wastewater treatment plant, water supply treatment plant, or air pollution control facility); and other discarded material. Solid waste is generated on the BMGR as a result of activities associated with all training activities. Routine military waste management is accomplished by means of wastewater treatment lagoons at the Gila Bend AFAF, septic systems at other established support facilities, and the regular removal of all other hazardous and solid wastes from the BMGR for recycling or disposal in approved off-range landfills. During military troop deployment exercises on the range, all solid waste is collected, contained, transported off range, and disposed of in accordance with all applicable rules and regulations.

Each training range is closed annually for maintenance. During the closures, Explosive Ordnance Disposal personnel render any unexploded and partially exploded ordnance inert and nonhazardous, and remove the remaining residue to a central collection point to be processed for recycling. A small amount of debris, mainly wood targets and sea-land container liners are either ground in place as mulch or removed for disposal in a sanitary landfill off the BMGR.

The management of non-military waste on the BMGR is largely limited to the current recreation user code of conduct, which is communicated via the permit program. However, some occurrences of solid waste littering by recreational visitors, individuals illegally entering the U.S. from Mexico, and other illegal dumping have been identified on the BMGR. Although no specific area has been identified as a central location for illegal dumping, solid waste has been spotted in areas along the borders of the BMGR as well as along I-8 and SR 85. Solid waste dumping has also been observed scattered in designated recreational use areas of the range.

6.3 UPDATE

6.3.1 BMGR West

Since the 2007 INRMP was completed, two occurrences of soil contamination were remediated at BMGR West.

On 9 October 2007, 50 gallons of JP-08 aviation jet fuel was accidentally spilled at the Ground Support Area 50 (see the Ground Support Area along the northern boundary of BMGR West in Figure 3). The contaminated soil was removed and disposed of in accordance with the Best Management Practices (BMPs) and Arizona Department of Environmental Quality (ADEQ) requirements.

On 4 April 2009, 25 gallons of JP-08 aviation jet fuel was accidentally spilled at the Cannon Complex (P-111) near the northwest corner of BMGR West (see Figure 3). The contaminated soil was removed and disposed of in accordance with the BMPs and ADEQ requirements.

6.3.2 BMGR East

No accidental spills have been reported at BMGR East between the 2007 INRMP and the present (2012). Any point source pollution, such as painting targets and burning wooden target debris, is remediated in accordance with the BMPs and stipulations in the permits from either ADEQ or Maricopa County.

Remediation activities at Auxiliary Field 6 (AUX 6) and the Munitions Treatment Range (MTR) have continued in the past five years. AUX 6 is a triangular combination of three primitive airstrips located on an active portion of the BMGR East, approximately 1 mile west of SR 85 (see Figure 6). AUX 6 was

established during World War II to support pilot training activities. When AUX 6 was no longer needed for aviation training, it became an area used for other types of training and for munitions disposal. From approximately the early 1950s through the early 1970s, unexploded ordnance (UXO) and munitions debris resulting from the training mission at BMGR was periodically cleared from target areas and gathered at AUX 6. There it was treated and/or disposed of by a combination of open burning and open detonation (OB/OD).

While the details of this use is uncertain, environmental investigations of the debris left after the OB/OD process have recovered a range of munitions items including rocket propellant, flares, grenades, fuses, 20mm tracer and high explosive rounds, small-arms ammunition, aircraft egress components, and practice bomb cartridges. The OB/OD process was imperfect and sometimes resulted in burial of live munitions items. These activities seemed to have occurred in four specific areas of AUX 6: an infield detonation area, a pad-mounted burn furnace (since dismantled and removed), and two OB/OD pits.

It is thought that munitions disposal and burial at AUX 6 ceased in the late 1960s or early 1970s. At that time, EOD operations were relocated to the MTR located south of the Range 4 access road. Munitions disposal operations are currently not conducted at AUX 6.

In 2006, the Arizona Department of Environmental Quality (ADEQ) issued a Resource Conservation Recovery Act (RCRA) Post-Closure Permit to Luke AFB for Unit 8 located on the BMGR Munitions Treatment Range. A condition of the Post-Closure Permit was completion of an RCRA Facility Investigation for AUX 6 to determine whether past hazardous waste releases at the airfield might require corrective measures. Three sites within the boundaries of AUX 6 were determined to be RCRA sites and designated as solid waste management unit (SWMU) “sub-sites:” a former burn kettle, southeast OB/OD area, and northwest OB/OD area. The fourth SWMU sub-site, the infield detonation area, was closed without the need for further investigation in 2008.

The Southeast OB/OD pit was closed by ADEQ in 2012 after sampling and analysis revealed that corrective measures were not required given the current function of the site and land-use controls. The former burn furnace and northwest OB/OD areas remain to be investigated. The next step will be a digital geophysical mapping task to peer into the ground for the presence of buried metallic objects and develop a conceptual site model for further investigation. This work is scheduled for May of 2012. Excavation and/or sampling and analysis may be conducted as a follow-up, as warranted based on the results of the investigation.

The MTR, sometimes referred to as the EOD Range, is located approximately 9 miles south of AUX 6 (see Figure 6). The MTR consists of eight former treatment units and two detonation areas. The eight treatment units have all been closed by ADEQ, although one unit requires periodic inspections and maintenance of an engineered landfill cap that controls the migration of contaminants from the former OB/OD pit. One detonation area at the MTR is currently used solely for emergency response activities and training exercises exempt under RCRA. The second, the White Phosphorous Detonation Area, was clean-closed by ADEQ in 2010 after an environmental investigation.

Currently all munitions and explosives of concern and/or munitions debris is either processed for demilitarization and off-site recycling, or if it cannot be certified as non-hazardous, shipped to a centralized treatment facility out of state. If a UXO item is unsafe to ship, it is handled under explosive

ordnance protocol, and the UXO is detonated on-site. No on-site burning or disposal of debris is currently conducted.

Additionally, and in accordance with Section 106 of the NHPA, Luke AFB consulted with the Arizona SHPO and Native American tribal representatives prior to commencing the investigative/remedial activities.

CHAPTER 7.0 SUMMARY OF PUBLIC INVOLVEMENT PROGRAMS SINCE THE MOST RECENT REPORT

As the primary users and managers of BMGR East and BMGR West, respectively, the U.S. Air Force and the U.S. Marine Corps have been delegated certain responsibilities. One of these is maintaining a range management balance that ensures long-term use of the facility as a premier military training location while ensuring long-term management and protection of the natural resources of the BMGR. In that capacity, the services routinely provide forums for public outreach and opportunities for the public to learn about and provide input on various actions proposed for the BMGR. The following is an overview of the various public involvement programs and opportunities associated with the BMGR that have occurred or have continued since the 2007 INRMP.



Public outreach events provide opportunities to share information about the BMGR with the public.

7.1 BARRY M. GOLDWATER RANGE EXECUTIVE COUNCIL

Oversight of range management processes and activities at the range is provided by the Barry M. Goldwater Range Executive Council (BEC), an executive board composed of representatives of agencies that have vested interests in BMGR lands. The BEC is chaired by the Director of the 56 RMO, and includes representatives from MCAS Yuma, BLM, USFWS, AGFD, U.S. Customs and Border Protection, and directors for the adjacent Sonoran Desert NM, Organ Pipe Cactus NM, and Cabeza Prieta NWR. The BEC meets six times throughout each year to discuss and develop solutions for regional problems as well as to discuss how to treat certain public use issues with consistency within the region.

7.2 BMGR INTERGOVERNMENTAL EXECUTIVE COMMITTEE

Another forum that is open to the public and that involves discussions of BMGR land management issues is the Intergovernmental Executive Committee (IEC), which was established by Congress in 1999. The IEC is composed of representatives from the Departments of the Air Force, Navy, and Interior as well as representatives of other federal, state, county and municipal government agencies and Native American tribes that have interests in the BMGR. The IEC meets three times per year in January, May, and September. IEC meetings provide opportunities for the public and special interest groups to learn about and provide input on how BMGR lands, flora and fauna, and cultural heritage are managed and protected. IEC meeting minutes are posted on a public website: <http://www.luke.af.mil/library/factsheets/factsheet.asp?id=5063>. Meeting dates are announced at the conclusion of each meeting, and a “mark your calendar” email is sent to the IEC distribution list a few weeks later to give several months' notice.

7.3 BMGR WEST

The U.S. Marine Corps provided public involvement opportunities in the preparation of an EIS for the Basing of the Marine Corps JSF F-35B on the West Coast, at both MCAS Yuma in Arizona and MCAS Miramar in California. The public involvement plan for the program followed NEPA guidelines and included: (1) public notification in the Federal Register and local newspapers as well as on the project website (<http://www.usmcjsfwest.com>); (2) public scoping meetings and open house meetings held in

both Yuma and San Diego; and (3) a public comment period during which 325 public comments were documented for the administrative record. The Record of Decision for the EIS was signed on 9 December 2010.

The U.S. Marine Corps subsequently conducted a variety of public outreach efforts regarding the development of JSF facilities at BMGR West, including a public meeting and a ground breaking event for new JSF hangars aboard the Air Station in June 2011; quarterly updates on JSF construction to local newspapers; and, presentations to interested community groups.

Other public outreach efforts by the Marine Corps have included the development of information and infrastructure improvements to facilitate public recreational activities at BMGR West, including:

- A bird checklist for birding enthusiasts
- A public brochure and map detailing retained road access and outlining range rules (for example, rule for camping, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, and trash disposal)
- Installation of signs, gates, and fences to support road infrastructure and public access

7.4 BMGR EAST

In 2010, the U.S. Air Force completed the Final EIS for range enhancements at BMGR East. The public involvement plan for the program followed NEPA guidelines and included: (1) public notification in the Federal Register and newspapers in Glendale, Gila Bend, Tucson and Yuma, Arizona, as well as on the Luke AFB website; (2) public scoping meetings held in Glendale, Tucson and Gila Bend; and (3) public hearings in Gila Bend, Glendale, and in Tucson in 2009. A Record of Decision for selected enhancements addressed in the EIS was signed on 20 May 2011. Information on the EIS and the EIS document can be obtained at: <http://www.luke.af.mil/library/factsheets/factsheet.asp?id=5028>.

Other public outreach efforts by the Air Force have included the development of information and infrastructure improvements to facilitate public recreational activities at BMGR East, including:

- Updated public visitation maps and rules for public education and recreation use
- An informational video for visitors that addresses safety and environmental awareness
- Installation of signs, gates, and fences to support road infrastructure and public access



The installation of road signs and physical barriers help to provide suitable access without redundancy in the road network system.



Volunteers helped to remove graffiti to help keep the range in its natural condition.

The Air Force conducts public meetings on various issues that are announced via its website, newsletters, mailings, newspaper advertisements or legal notices, and other means. It also prepares annual reports concerning the public involvement programs at BMGR East, and the RMO maintains a web page containing information on the BMGR East Public Outreach (URL: <http://www.luke.af.mil/library/factsheets/factsheet.asp?id=5063>). Focus areas for public involvement programs include:

- Tours
- Indian Nations brief
- Articles published
- Speaking events
- Media coordination
- Special projects and events
- Miscellaneous requests and participation in events



Tours with Native Americans provide opportunities to understand the cultural history of the BMGR and to guide future management.

Participation in the public involvement programs in each category has increased yearly since 2007. The 56 RMO staff will continue to offer public involvement opportunities and to provide outreach to the public, particularly because public participation has increased from the previous years for all the activities listed above. Ongoing exercises and operations continue to generate media interest both at Gila Bend and BMGR. Requests for speakers, briefings, appearances and tours continue to increase, along with requests for participation in town, county, and state meetings to coordinate efforts and share information.

CHAPTER 8.0 PROPOSED IMPLEMENTATION SCHEDULE FOR 2013-2017

Many of the action steps identified as priority range management tasks in the 2007 INRMP have been completed and some are ongoing actions that will continue in the next five-year period (see status of past actions in Appendices A and B). In planning for the next five years, MCAS Yuma and Luke AFB have each developed a preliminary list of proposed action steps for 2013-2017. These action steps were identified by considering data acquired through inventory and monitoring activities in the past five years, changes that have occurred in the past five years (as reported in earlier chapters of this report), emerging management issues, and input from other agencies with land management or regulatory authority in the BMGR region.

In the development of the INRMP, 17 management elements were evaluated in detail for their effect on the environment. The resource management program was selected based on the environmental analysis, public comments, and military requirements and policy to protect natural infrastructure assets. While not every management element requires action in each five-year period of the plan, each element is considered. The resource management elements follow and are referenced by number in the first column of Table 14 and Table 15.

1. Resource Inventory and Monitoring
2. Special Natural/Interest Areas
3. Motorized Access and Non-roaded Area Management
4. Camping and Visitor Stay Limits
5. Recreation Services and Use Supervision
6. Rock hounding
7. Wood Cutting, Gathering, and Firewood Use, and Collection of Native Plants
8. Hunting
9. Recreational (Target) Shooting
10. Utility/Transportation Corridors
11. General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters
12. Special Status Species
13. Soil and Water Resources
14. Air Resources
15. Visual Resources
16. Wildfire Management
17. Perimeter Land Use, Encroachment, and Regional Planning

Before proposed action steps, priorities, funding requirements, or other factors for the next five years are finalized, range managers will consider the public input, consultations with Native Americans, and any additional partner agency feedback received on this Public Report. The proposed implementation plan, as shown in Table 14 and Table 15, list the actions proposed by MCAS Yuma for BMGR West and by Luke AFB for BMGR East, respectively.

Table 14. INRMP BMGR-West 5-Year Action Plan: 2013-2017

Element ¹	Action Step ²	Fiscal Year ³	Funding ⁴	Frequency ⁵	Partners ⁶	Comments	Year 1	Year 2	Year 3	Year 4	Year 5
Resource Management											
1	Implement inventory and monitoring plan:										
1	Brassica study	Years 1	Varies	One-time	CESU	Characterize and model brassica invasion throughout the range.	\$38,460				
1	FTHL JSF Impact Study	Years 1, 2	Varies	One-time	CESU	Evaluate the impact of research that will address potential impacts of JSF operations on FTHL as identified by the USFWS's BO.	\$135,000	\$128,000			
	FTHL occupancy surveys	TBD	TBD	Varies	In-house / AGFD	Support AZGFD in conducting demographic and occupancy surveys as outlined in the FTHL Monitoring Plan developed by the FTHL Interagency Coordinating Committee					
1	Complete range wide vegetation map	Year 1	\$100,000	One-time	University	Complete range wide vegetation map	\$100,000				
1	Identify and monitor vegetation plots in several plant communities	Years 2, 3, 4	Varies	Annual	In-house / Contractors	Each plot is assessed at 5-year intervals					
1	Reptile, small mammal, and amphibian surveys and monitoring	TBD	Varies	One-time	In-house / Contractors	inventory distribution and abundance of the reptiles, amphibians, and small mammals 2)develop monitoring protocols for reptiles and amphibians	\$155,000	\$200,000			
1	General bird surveys	Year 1	\$60,000	Every 5 years	AGFD	New protocol under development by AZ Bird Conservation Initiative; survey 3 consecutive years, pause 5 to 10 years, repeat	\$60,000				
1	Bat surveys	Annual	In-kind	Annual	In-house / AGFD	Assist AZGFD in conducting bat surveys at the Betty Lee and Wellton Hill Mines					
1	Collaborate with AGFD to identify and maintain important wildlife connectivity corridors on BMGR East	Annual	Varies	Varies	AGFD	Collaborate with AGFD to identify and maintain important wildlife connectivity corridors on BMGR East					
1	Installation and maintenance of weather stations and rain gauges	TBD	Varies	Varies	In-house	Operate 10 existing remote-access stations, plus several dozen rain gauges at specific study locations	\$75,000	\$2,000	\$2,000	\$2,000	\$2,000
1	Medium and low priority actions as resources allow	Annual	Varies	Varies	TBD	Some lower-priority actions may be completed based on adaptive management concerns or availability of resources					
1	Support special studies to address specific management issues, such as invasives, species of concern, climate change, etc.	Annual	Varies	Annual	In-house / Interagency / University	Supports research proposals developed by universities, AGFD, USGS, or others that address various issues of concern	\$75,000	\$75,000	\$75,000		
1	Implement cultural resource survey and monitoring requirements for INRMP - related actions	Years 2, 4	\$150,000	Annual	In-house / Contractors	Continue surveys along roadways and nearby potential cultural sites in Area B; includes recording of camp sites					
2	Identify and evaluate other possible Special Natural / Interest Areas	Varies	TBD	Varies	In-house						
12	Participate and implement actions per the Sonoran Pronghorn Recovery Plan	Annual	\$80,000	Annual	Interagency	Pronghorn recovery actions as stipulated in the Biological Opinion, recovery plan, or as determined by the interagency Recovery Team	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
13	Comprehensive erosion assessment to prioritize the sites with severe erosion, and examine available engineering management practice that can mitigate erosion	TBD	Varies	One-time	Interagency / University	This study aims to assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion.	\$100,000	\$100,000	\$100,000		
11	Partner w/Border Patrol to identify and implement habitat restoration	TBD	Varies	Annual	In-house	Active and passive restoration of degraded areas					
16	Implement fire management plan	TBD	TBD	One-time	In-house	Assess fire risk and implement restrictions as appropriate					
	Rangewide soil map						\$439,290	\$245,548	\$228,109	\$222,584	
	Aerial imagery for range and base							\$300,000	\$300,000		
	Characterization of Anthropogenic Impacts								\$150,000		
Motorized Access											
3	Close selected roads to public access where an agency mission or resource protection issues conflict with public use	As-required	TBD	As-required	In-house	Access restrictions may be imposed due to evolving weapons safety footprints, protection of natural or cultural resources, law enforcement concerns or other management actions					
Public Use											
4	Assess benefits and effects of establishing designated camping areas and implement a decision based on the findings	Year 5	\$-	One-time	In-house	Incomplete information available to make an assessment; existing camp sites are being recorded as part of cultural resources surveys along road corridors; survey work is about 50% complete.					
5	Revise visitor map	Year 3	\$3,000	One-time	In-house / USMC	Revise public visitation maps and rules for public education and recreation use; would inform the public about road restrictions and resource sensitivities					
5	Public outreach	Annual	\$5,000	Annual	In-house	Supports public awareness projects to educate base personnel / public about BMGR cultural resources, natural resources, historical preservation, and conservation activities.					

Table 14. INRMP BMGR-West 5-Year Action Plan: 2013-2017

Element ¹	Action Step ²	Fiscal Year ³	Funding ⁴	Frequency ⁵	Partners ⁶	Comments	Year 1	Year 2	Year 3	Year 4	Year 5
5	Install signs, gates, and fences to support road infrastructure and public access	TBD	\$5,000	Reoccurs as needed	In-house	Install and maintain signage at range entry points, along perimeters, and at all road intersections.					
5	Compile recreation use statistics. Analyze patterns, identify heavily used areas. Monitor those areas to identify any resource concerns	Annual	\$5,000	Annual	In-house						
Manage Realty Property											
10	Cooperate with ADOT, US Border Patrol, and utility companies regarding proposed actions within existing utility/ transportation corridors	Ongoing	\$-	As required	ADOT, USBP	Continuation of dialogue and partnership with proponent and supporting action agencies					
Perimeter Land Use											
17	Participate in local and regional planning and monitoring land use patterns	As required	\$-	As required	In-house / Interagency	Participate in development or review of environmental assessments or impact statements, resource management plans					
17	Monitor illegal immigration, trafficking, and border-related law enforcement to anticipate how BMGR resources may be affected	Ongoing	\$-	Annual	In-house / Interagency	Continuation of informal coordination with law enforcement authorities and anecdotal evidence of border-related impacts	\$862,337	\$589,400	\$346,158	\$311,400	\$311,400
FUNDING TOTALS BY YEAR							\$2,120,087	\$1,719,948	\$1,281,267	\$615,984	\$393,400

¹ Resource Management Element from INRMP
² Fulfill requirement of resource management element
³ Year of funding and completion of action
⁴ Estimate of required funding amount to complete project
⁵ How often action will occur
⁶ Responsible parties for completing the action
* May require further NEPA review and / or Section 106 consultation.

Table 15. INRMP BMGR-East 5-Year Action Plan: 2013-2017

Element ¹	Action Step ²	Fiscal Year ³	Funding ⁴	Frequency ⁵	Partners ⁶	Comments	Year 1	Year 2	Year 3	Year 4	Year 5
Resource Management											
1	Develop Inventory and Monitoring Plan	2006 / 2007		1 X	Interagency	Delete. Plan completed in 2007					
1	Implement inventory and monitoring plan:										
1, 11	Monitor and control invasive species	Annual	\$50,000	Annual	In-house / Interagency	Ongoing monitoring occurs while driving range roads, control measures performed when necessary and appropriate	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
1	Monitor 92 vegetation plots in several plant communities	Annual	\$10,000	Every 5 years	In-house / Contractors	Each plot is assessed at 5-year intervals	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
1	Desert tortoise surveys	Year 5	\$50,000	Every 5 years		Re-survey known occupied and suitable habitat identified during previous surveys					\$50,000
1	Raptor management surveys and monitoring	Annual	\$10,000	Annual	In-house / AGFD	Support bald eagle nest watch, golden eagle surveys, raptor surveys, assess potential for powerline electrocution, etc.	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
1	Bird surveys	Years 1, 2	\$35,000	Varies	In-house / AGFD	New protocol under development by AZ Bird Conservation Initiative; survey 3 consecutive years, pause 5 to 10 years, repeat	\$35,000	\$35,000			
1	Support AGFD surveys for game ungulates	Varies	\$-	Varies by species	AGFD	Support and participate in surveys performed by AGFD					
1	Support AGFD surveys for gamebirds	Annual	\$-	Annual	AGFD	Support and participate in surveys performed by AGFD					
1	Collaborate with AGFD to identify and maintain important wildlife connectivity corridors on BMGR East	Annual	\$-	Annual	AGFD	Collaborate with AGFD to identify and maintain important wildlife connectivity corridors on BMGR East					
1	Kit fox population monitoring	Years 1, 4	\$5,000	Every 3 years	In-house	Continuation of population monitoring using scent stations	\$5,000			\$5,000	
1	Bat surveys; evaluate, monitor and protect important bat roosts	Annual	\$25,000	Annual		Various survey techniques: acoustic monitoring, mist net traps, roost assessments, etc.	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
1	CFPO survey (low priority)	Years 1, 3, 5	\$5,000	Every 2 years		Low priority: no CFPO detected on BMGR East during repeated surveys over past 20 years; marginal habitat	\$3,000		\$3,000		\$3,000
1	Weather stations and rain gauges	Annual	\$-	Annual	In-house	Operate 10 existing remote-access stations, plus several dozen rain gauges at specific study locations					
1	Monitor use of wildlife waters	Annual	\$15,000	Annual	In-house / AGFD	Continuation of program using wildlife cameras to record usage during summer months; evaluate resulting thousands of photographs to build database of species, abundance, location, etc.	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
1	Medium and low priority actions as resources allow	Annual	\$10,000	Varies	TBD	Some lower-priority actions may be completed based on adaptive management concerns or availability of resources	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
1	Vegetation mapping	Years 3, 5	\$25,000	Annual	In-house / Interagency / University	Continuation of vegetation mapping project being performed by University of Arizona; uses standardized method in use by regional land managers			\$25,000		\$25,000
1	Support special studies to address specific management issues, such as invasives, species of concern, climate change, etc.	Annual	Varies	Annual	In-house / Interagency / University	Supports research proposals developed by universities, AGFD, USGS, or others that address various issues of concern	\$19,000	\$27,000	\$34,000	\$37,000	\$19,000
1	Implement cultural resource survey and monitoring requirements for INRMP - related actions	Years 2, 4	\$150,000	Annual	In-house / Contractors	Continue surveys along roadways and nearby potential cultural sites in Area B; includes recording of camp sites		\$150,000		\$150,000	
2	Define and designate the Mohawk Dunes Special Natural / Interest Area as required	2007	\$-	1X	In-house	Delete. Designation occurred as part of INRMP completion in Mar 2007					
2	Identify and evaluate other possible Special Natural / Interest Areas	Year 4	\$20,000	One-time	In-house	Bender Spring and Paradise Well are candidate areas, also contemplating a nature trail in Crater Range				\$20,000	
11	Habitat restoration *	As needed	\$25,000	Annual	In-house	Active and passive restoration of degraded areas	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
11	Evaluate benefits and adverse effects of wildlife waters	Year 5	\$50,000	One-time	In-house / Interagency / University	Perform a holistic review based on previous studies on BMGR and relevant literature.					\$65,000
11	Develop and implement procedures to control trespass livestock	Annual	\$5,000	Annual	In-house	Address burgeoning burro population in Area B and trespass cattle	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
11	Allow for the maintenance and repair of existing water developments *	As needed	TBD	Reoccurs as needed	AGFD	Support AGFD annual maintenance of all waters and redevelopment as required					
12	Participate and implement actions per the Sonoran Pronghorn Recovery Plan	Annual	\$220,000	Recurring actions	Interagency	Pronghorn recovery actions as stipulated in the Biological Opinion, recovery plan, or as determined by the interagency Recovery Team	\$220,000	\$220,000	\$220,000	\$220,000	\$220,000
13	Evaluate erosion conditions of range roads; repair or temporarily restrict use *	Annual	\$-	Annual	In-house	Annual driving inspection of the most heavily-used range roads; secondary and tertiary roads driven at least every 3 years					
13	Evaluate erosion problems in specific areas, develop plans for repair	Year 3	\$100,000	One-time	Interagency / University	Road maintenance practices in many areas are non-sustainable			\$100,000		
13	Monitor water table levels	Annual	\$-	Annual	In-house	Performed by range operations contractor					

Table 15. INRMP BMGR-East 5-Year Action Plan: 2013-2017

Element ¹	Action Step ²	Fiscal Year ³	Funding ⁴	Frequency ⁵	Partners ⁶	Comments	Year 1	Year 2	Year 3	Year 4	Year 5
14	Develop Best Management Practices for activities with potential for generating non-point source pollution	2011	TBD	TBD	In-house	Delete. Don't have a defined requirement.					
14	Control excessive fugitive dust at permitted construction sites and recreation activity areas	As-required	\$-	TBD	In-house	Performed by range operations contractor as part of recurring maintenance work					
16	Develop fire management plan	2007	\$-	1X	In-house	Delete. Funded Tonto National Forest to prepare plan; final draft submitted in Sep 2011					
16	Implement fire management plan	Annual	\$-	One-time	In-house	Assess fire risk, implement campfire restrictions as appropriate; maintain firefighting agreement with BLM					
Motorized Access											
3	Close selected roads to public access where an agency mission or resource protection issues conflict with public use	As-required	TBD	As-required	In-house	Access restrictions may be imposed due to evolving weapons safety footprints, protection of natural or cultural resources, law enforcement concerns or other management actions					
Public Use											
4	Assess benefits and effects of establishing designated camping areas and implement a decision based on the findings	Year 5	\$-	One-time	In-house	Incomplete information available to make an assessment; existing camp sites are being recorded as part of cultural resources surveys along road corridors; survey work is about 50% complete.					
5	Revise public visitation maps and rules for public education and recreation use; would inform the public about road restrictions and resource sensitivities	Annual	\$3,000	Annual	In-house / USMC	Annual revisions based on results of area monitoring and clarifications of rules printed on the map reverse.	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
5	Public outreach	Annual	\$5,000	Annual	In-house	Supports public awareness projects to educate base personnel / public about BMGR cultural resources, natural resources, historical preservation, and conservation activities. Includes brochures such as the BMGR-East bird checklist and a 'benefits of non-lead ammo' brochure.	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
5	Hire law enforcement officers to be retained and dedicated to the BMGR-East; interim measure consists of contract security guards with detention authority	TBD	TBD	One-time	In-house	Contract security guards are in place. Continue working with Manpower office to establish authorizations for federal law enforcement officers. Outlook is uncertain given projected AF-wide funding and manpower reductions.					
5	Install signs, gates, and fences to support road infrastructure and public access	Annual	\$5,000	Reoccurs as needed	In-house	Install and maintain signage at range entry points, along perimeters, and at all road intersections.	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
5	Compile recreation use statistics. Analyze patterns, identify heavily used areas. Monitor those areas to identify any resource concerns	Annual	\$5,000	Annual	In-house	Range Security personnel to track call-on and call-off data from recreational visitors. Use vehicle traffic counters to quantify intensity of use at general and specific areas.	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
7	Monitor native wood supplies in high-use areas; restrict wood collection if resource conditions dictate	Year 1	\$-	Recurr every 5 years	In-house	Use completed cultural resources surveys in Area B to identify high-use areas; assess in Year 1					
8	Assess the need for a fee - based special hunting permit program; revenues to be used for conservation	2011	\$-	One-time	USMC	Delete this line item? Labor costs to collect and manage funds would likely exceed revenues.					
8	Evaluate the effects of non-game species collection on wildlife, habitat, and other resources and, if indicated, limit or restrict collection activities within the authority of state law	2009	\$-	One-time	USMC	Delete. No indications of a problem; no data available to support an assessment or decision.					
9	Assess importance and character of recreational shooting as an activity/issue to determine the appropriateness of this activity on the BMGR and implement a decision based on the findings	2011	\$-	One-time	USMC	Delete. No indications of a problem; no data available to support an assessment or decision.					
9	Consider designating specific shooting area(s)	2011	\$-	One-time	USMC	Delete. No perceived need for a designated shooting area.					
Manage Realty Property											
10	Cooperate with ADOT, BLM, US Border Patrol, and utility companies regarding proposed actions within existing utility/transportation corridors	Ongoing	\$-	As required	ADOT, BLM, USBP	Continuation of dialogue and partnership with proponent and supporting action agencies					
10	Coordinate with CE Real Property to restrict future utility and transportation corridors to the existing State Route 85 and railroad rights of way	Ongoing	\$-	As required	In-house	Activities within the ROW include operation and maintenance of overhead power lines, buried fiber optic lines, and a Border Patrol checkpoint					

Table 15. INRMP BMGR-East 5-Year Action Plan: 2013-2017

Element ¹	Action Step ²	Fiscal Year ³	Funding ⁴	Frequency ⁵	Partners ⁶	Comments	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Perimeter Land Use</i>											
17	Participate in local and regional planning and monitoring land use patterns	As required	\$-	As required	In-house / Interagency	Participate in development or review of environmental assessments or impact statements, resource management plans; serve as DOD clearinghouse for energy development proposals in AZ					
17	Monitor illegal immigration, trafficking, and border-related law enforcement to anticipate how BMGR resources may be affected	Ongoing	\$-	Annual	In-house / Interagency	Continuation of informal coordination with law enforcement authorities and anecdotal evidence of border-related impacts					
FUNDING TOTALS BY YEAR							\$450,000	\$600,000	\$550,000	\$600,000	\$550,000

¹ Resource Management Element from INRMP
² Fulfill requirement of resource management element
³ Year of funding and completion of action
⁴ Estimate of required funding amount to complete project
⁵ How often action will occur
⁶ Responsible parties for completing the action
* May require further NEPA review and / or Section 106 consultation.

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APPENDIX A

**BMGR WEST INRMP – MANAGEMENT ELEMENTS AND
STATUS OF ACTION PLAN ITEMS**

Appendix A

BMGR West INRMP – Management Elements and Status of Action Plan Items

The following 17 management elements were identified to be implemented in the INRMP. The Action Plan Items listed under each of the 17 management elements are the actions that were to be implemented with the 2007 INRMP. The Action Plan Items provide updated information on the status and progress for each action.

Note: the acronym definitions are provided in the List of Acronyms and are not repeated in this table.

Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items

Management Element and 2007 Action Items			
1	Resource Inventory and Monitoring <ul style="list-style-type: none"> • Ecosystem and limits of acceptable change monitoring systems will be developed and implemented for the BMGR and the extent and intensity of resource surveys will be increased. • Additional vegetation and wildlife surveys, in particular, will be conducted to monitor the ecosystem health and biodiversity. • Ecosystem monitoring will detect trends within the BMGR ecosystem that would indicate overall biodiversity and health. • 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. 		
	Action Plan Item	Status	Progress
1.1	Develop an ecosystem inventory and monitoring program for wildlife and habitat.	C	USGS completed the I&M Plan and published it as an Open-File Report http://pubs.usgs.gov/of/2011/1232/ .
1.2	Implement an ecosystem monitoring program for wildlife and habitat.	I	The following projects funded include: 1) the evaluate landscape changes/disturbances (\$90K), the findings from the landscape evaluation will provide a baseline for habitat monitoring; 2) FTHL occupancy and demographic surveys (\$233K) and JSF FTHL survey (\$232K); 3) rangewide vegetation map (\$232K); 4) Brassica research (\$90K); and 5) rangewide bird survey (\$60K).
1.3	Implement a cultural resources monitoring program.	I	Monitoring of select sites on an annual basis has been implemented.
1.4	Implement the provisions of the cultural resources programmatic agreement, which includes a phased cultural resource inventory based on prioritized survey areas.	O	All phases of the inventory have been completed as of the end of FY 2011. The Reporting Phase, discussing results and management recommendations is completed.
1.5	Develop and implement systems to monitor the effectiveness of compliance actions.	N	Initial survey was initiated.

Status:

- C = Completed
- O = Ongoing and Expect to continue
- I = Initiated but Incomplete
- N = Not initiated

Notes:

*May require further NEPA review and/or Section 106 consultation.

Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
1.6	Develop a plan for determining the limits-of-acceptable change for recreational, natural and cultural resources.	N	Range Management has initiated a baseline survey.
1.7	Construct adaptive management strategies for maintaining acceptable limits of change.	N	Range Management has initiated a baseline survey.
1.8	Allow maintenance and development of existing water sources supporting wildlife*.	O	AGFD maintains 18 wildlife waters.
1.9	Participate in and implement recovery actions for special status species (e.g., Sonoran Pronghorn and Flat-tailed Horned Lizard).	O	Sonoran Pronghorn - \$315K, participate in Recovery Team Meetings; FTHL - \$465K, serve on ICC and Management Oversight Group (MOG); provide support for AGFD's LeConte's Thrasher surveys.
1.10	Develop an invasive species management program.	I	1) Finalizing vegetation map 2) remove invasive species when feasible 3) partnered with LAFB to fund (\$90K) characterize and model brassica invasion throughout the BMGR. The study will examine the affect brassica invasion, long-term coexistence between brassica and native annual plants, and suggest management strategies.
1.11	Conduct habitat restoration efforts for damaged areas*.	O	Installed 3 bat gates to protect maternal colonies and enforce closed roads.
Management Element and 2007 Action Items			
2	Special Natural/Interest Areas <ul style="list-style-type: none"> • The Flat-tailed Horned Lizard Habitat Management Area and the three previously designated ACECs will be redesignated as special natural/interest areas. • The two 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. • 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. 		
	Action Plan Item	Status	Progress
2.1	Redesignate ACECs and HMAs as special natural interest areas and expire Backcountry Byways.	N	No new areas have been identified.
2.2	Evaluate potential for altering existing or establishing additional special natural interest areas.	N	No new areas have been identified.

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- O = Ongoing and Expect to continue
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- N = Not initiated

Notes:

*May require further NEPA review and/or Section 106 consultation.

Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element and 2007 Action Items			
3	Motorized Access and Non-roaded Area Management Redundant 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. <ul style="list-style-type: none"> • Of the 2,222 miles (3,576 km) of existing roads within the BMGR, approximately 30 percent, or 616 miles (991 km), will be closed at the percentages defined in the 2007 INRMP. See Figures 4 and 5 for the roads that will remain open. • Site-specific planning for two bypass roads (totaling approximately 7 miles, or 11 km) to reroute primarily Border Patrol traffic around rather than through the Cabeza Prieta NWR/Wilderness may be allowed to proceed should the USFWS, Border Patrol, or another agency develop the need and funding to establish these new roads. • 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. • Non-roaded areas of 3,001 acres (1,214 hectares) 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. There will be 78 such non-roaded areas within the BMGR. The largest of these, which occurs in BMGR-East, will be more than 102,000 acres (41,278 hectares); the largest non-roaded area within BMGR-West will be nearly 85,000 acres (34,398 hectares). 		
	Action Plan Item	Status	Progress
3.1	Retain the majority of existing motorized access roads and close redundant roads.	C	Redundant roads have been closed.
3.2	Temporarily close selected roads to the public when an agency mission or resource protection issue arises.	O	Partial range closures continue for the pronghorn fawning season and twice a year for laser training during WTI.
3.3	Evaluate site-specific proposals for future need and impacts of developing additional roads for agency purposes*.	O	The creation of new roads is avoided to the greatest extent possible. The JSF project will upgrade the existing road and its EIS authorized the construction of a 1.1 mile road.
3.4	Install signs, gates, and fences to support road infrastructure and public access.	C	Installed signs for restricted areas, bilingual laser warning signs, and landing zones.
3.5	Implement site specific planning for two bypass roads that would reroute vehicle traffic around the northwest corner of the Cabeza Prieta NWR.	N	The need for the bypass road has dissipated with completion of the border fence.
3.6	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	Completed in 2008 and is available at the Permitting Office or Range Management.
3.7	Codify rules and establish schedule of fees for enforcing regulations.	O	The rules have been codified, and the range wardens now have concurrent jurisdiction to write tickets under state law.

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Notes:

*May require further NEPA review and/or Section 106 consultation.

Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element and 2007 Action Items			
4	Camping and Visitor Stay Limits <ul style="list-style-type: none"> • Dispersed, self-contained camping (non-vehicle based) will continue to be allowed in all areas open to the public. • 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. Vehicles will continue to be allowed to pull up to 50 feet (15 meters) off the road, although campsites could be located farther from the road. • An assessment will be completed to determine the appropriateness of establishing designated camping areas. • Vehicle-based camping stays will continue to be limited to 14 consecutive days within a 28-day period except by special use permit. • 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. 		
	Action Plan Item	Status	Progress
4.1	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
4.2	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
4.3	Maintain recreational use database to determine public use of natural resources, roads and compliance of rules for future action.	O	Permit office records the number of range passes issued per month.

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- N = Not initiated

Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element and 2007 Action Items			
5	Recreation Services and Use Supervision <ul style="list-style-type: none"> • Public off-road vehicle travel and also on- and off-road racing will continue to be prohibited. • Motorized public travel in washes will be prohibited except where the wash is a designated part of the road system open to the public and is dry. • 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. • 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. • Visitors will continue to need a permit to access the BMGR. • New public education and recreation use programs will be developed and implemented to inform the public about road restrictions and resource sensitivities. • A minimum of six law enforcement officers will be retained and dedicated to the BMGR. • 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. • Signs, gates, and fences will be installed based on a needs assessment. Roads that are open to public use will be marked as open. If a road does not have a sign that indicates that it is open, drivers will have to consider it closed. • Recreation use records and statistics will be developed and maintained. • Recreational use of metal detectors and entry to mines will be prohibited. 		
	Action Plan Item	Status	Progress
5.1	Develop a plan for determining the limits-of-acceptable change for recreational, natural and cultural resources.	N	See Progress report for Management Element 1.6.
5.2	Install signs, gates, and fences to support road infrastructure and public access.	C	See Progress report for Management Element 3.4.
5.3	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
5.4	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
5.5	Maintain recreational use database to determine public use of natural resources, roads and compliance of rules for future action.	O	See Progress report for Management Element 4.3.

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
5.6	Develop a special use permit (e.g., education, scientific research, large groups of people).	O	1) Hold harmless agreement is required to obtain range passes. 2) instructions/outline for range access is provided to special interest groups.
5.7	Implement public education and information programs.	O	Published a FTHL poster and a bird brochure; an interpretive trail was completed for the Fortuna Mine; and the range wardens provide tours (e.g., geocaching, rock collectors, off road users) upon request.
5.8	Retain a minimum of four full-time law enforcement positions.	C	Four full-time enforcement officer positions have been filled.
Management Element and 2007 Action Items			
6	Rock Hounding <ul style="list-style-type: none"> Rock hounding 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. Rock hounding will be prohibited in other parts of the BMGR. 		
	Action Plan Item	Status	Progress
6.1	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
6.2	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
Management Element and 2007 Action Items			
7	Wood Cutting, Gathering, and Firewood Use, and Collection of Native Plants <ul style="list-style-type: none"> 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). Woodcutting, 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. Woodcutting and wood gathering for purposes other than campfires will be prohibited throughout the range. Removal of wood from the range will also be prohibited. Collection or salvage of native plants will continue to be prohibited in accordance with the Arizona Native Plant Law. Collection of native plants will be allowed for protected Native American purposes. 		

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
7.1	Develop an ecosystem inventory and monitoring program for wildlife and habitat.	C	See Progress report on Management Element 1.1.
7.2	Implement an ecosystem monitoring program for wildlife and habitat.	I	See Progress report on Management Element 1.2
7.3	Develop a plan for determining the limits-of-acceptable change for recreational, natural and cultural resources.	N	See Progress report on Management Element 1.6.
7.4	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
7.5	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
Management Element and 2007 Action Items			
8	Hunting <ul style="list-style-type: none"> • Existing game management programs will continue. • An assessment will be conducted to determine whether 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. • 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. 		
	Action Plan Item	Status	Progress
8.1	Develop a plan for determining the limits-of-acceptable change for recreational, natural and cultural resources.	N	See Progress report on Management Element 1.6.
8.2	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
8.3	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
8.4	Assess the need for a special hunting permit program that requires payment of nominal fees to be used for the protection, conservation, and management of wildlife and habitat.	N	Managed through the state (AGFD).

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
8.5	Evaluate the effects of non-game species collection on wildlife, habitat, and other resources. Limit or restrict collection activities within the authority of state law.	I	Monitoring has been initiated; no population data have been collected to indicate declines due to overharvesting.
Management Element and 2007 Action Items			
9	Recreational (Target) Shooting <ul style="list-style-type: none"> Recreational shooting will continue to be allowed under existing regulations as long as it is compatible with military use, public safety, and no significant resource issues are identified. A special use permit will be required to shoot between sunset and sunrise or to use automatic weapons. An assessment will be conducted on the appropriateness of recreational shooting on the BMGR, including the potential for designating specific shooting areas. 		
	Action Plan Item	Status	Progress
9.1	Publish a public brochure and map detailing retained road access and outlining range rules (e.g., camping rules, off-road vehicle travel, rockhounding, firewood collection, hunting, native plant or wood collection, mine entry, recreational shooting, trash disposal).	C	See Progress report for Management Element 3.6.
9.2	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
9.3	Assess importance and character of recreational shooting as an activity/issue to determine the appropriateness of this activity on BMGR and implement a decision based on the findings.	O	No special use permits have been requested for recreational shooting.
Management Element and 2007 Action Items			
10	Utility/Transportation Corridors <ul style="list-style-type: none"> Construction of the Yuma Area Service Highway within a right-of-way that passes through the northwestern corner of BMGR-West will be allowed pending environmental analysis and approval. 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. 		
	Action Plan Item	Status	Progress
10.1	Establish best management practices to mitigate impacts to range resources.	I	The on-going baseline survey will provide data to draft Statement of Work and BMPs for vegetation, wildlife, road, and third party disturbances. These documents will outline methods to monitor, mitigate, and/or restore areas of concern.

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
10.2	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
10.3	Establish a protocol consistent with NEPA and other regulatory requirements for reviewing/approving proposed actions within existing utility/transportation corridors.	C	All projects are consistent with NEPA.
Management Element and 2007 Action Items			
11	General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters <ul style="list-style-type: none"> • Procedures will be developed to control all trespass livestock grazing. • Actions will be taken to prevent, control, and eradicate the spread of invasive species commensurate with the threats these species pose to natural resources. • Restrictions on activities will be implemented in key areas if needed to protect and conserve habitat, ecosystems, or biodiversity. • Areas damaged by a discontinued military, agency, or extensive public use will be restored by passive or active management actions. • 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. 		
	Action Plan Item	Status	Progress
11.1	Develop a plan for determining the limits-of-acceptable change for recreational, natural and cultural resources.	N	See Progress report for Management Element 1.6.
11.2	Support AGFD installation of up to a total of six high-priority wildlife waters on the BMGR*.	I	Wildlife waters will be installed at Sheep Mt and Big Rock. (Wildlife waters have been installed at Devil's Hill, Pintas, and in Ciprano Pass.)
11.3	Develop an invasive species management program.	I	See Progress report for Management Element 1.10.
11.4	Conduct habitat restoration efforts for damaged areas*.	O	See Progress report for Management element 1.11.
11.5	Develop procedures to control trespass livestock.	N	Trespass livestock is not a problem.
11.6	Evaluate benefits and adverse effects of wildlife waters.	N	The political controversy concerning wildlife waters has settled and sponsoring a symposium to discuss the benefits/detriments was unwarranted.
11.7	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element and 2007 Action Items			
12	Special Status Species <ul style="list-style-type: none"> • All existing and future compliance requirements for the protection and conservation of special status species will be met and supported. • 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. • Habitat improvements will be made in support of endangered species recovery plans. • Resources will be provided, as necessary, for predator control to protect a special status species. 		
	Action Plan Item	Status	Progress
12.1	Develop an ecosystem inventory and monitoring program for wildlife and habitat.	C	See Progress report on Management Element 1.1.
12.2	Implement an ecosystem monitoring program for wildlife and habitat.	I	See Progress report on Management Element 1.2.
12.3	Participate in and implement recovery actions for special status species (e.g., Sonoran pronghorn and flat-tailed horned lizard).	O	See Progress report on Management Element 1.9.
12.4	Codify rules and establish schedule of fees for enforcing regulations.	O	See Progress report for Management Element 3.7.
Management Element and 2007 Action Items			
13	Soil and Water Resources <ul style="list-style-type: none"> • Measures will be taken to continue to prevent soil erosion, water pollution, and groundwater depletion. • 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. • 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. 		
	Action Plan Item	Status	Progress
13.1	Develop an invasive species management program.	I	See Progress report for Management Element 1.10.
13.2	Conduct habitat restoration efforts for damaged areas*.	O	See Progress report for Management Element 1.11.
13.3	Conduct a range-wide soil survey following NRCS standards.	I	AGFD funded a preliminary soil map using remote sensing. A Level 2 soil map has been considered, but funding is not available.

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element and 2007 Action Items			
14	Air Resources <ul style="list-style-type: none"> • Actions will continue to be taken to control fugitive dust at construction sites and to prevent non-point source air pollution. 		
	Action Plan Item	Status	Progress
14.1	Not identified as an Action Plan Item in the BMGR INRMP 2007.		
Management Element and 2007 Action Items			
15	Visual Resources <ul style="list-style-type: none"> • The effects of new actions on visual resources will continue to be considered with a focus on minimizing degradation of scenic views. 		
	Action Plan Item	Status	Progress
15.1	Not identified as an Action Plan Item in the BMGR INRMP 2007.		
Management Element and 2007 Action Items			
16	Wildfire Management <ul style="list-style-type: none"> • 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. 		
	Action Plan Item	Status	Progress
16.1	Develop a range-wide fire management plan.	N	Historically, wildfires were not a concern. However, brassica invasion has the increase the potential for wildfires but no plan has been developed.
Management Element and 2007 Action Items			
17	Perimeter Land Use, Encroachment, and Regional Planning <ul style="list-style-type: none"> • 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. 		
	Action Plan Item	Status	Progress
17.1	Monitor land use changes in perimeter areas.	O	Cooperate with Community Planning and Liaison Office with regard to public outreach and joint use.
17.2	Monitor illegal immigration to anticipate how BMGR resources may be affected.	O	Trespassing and apprehension of UDAs has dramatically reduced with the completion of the border fence; continue to work with the U.S. Border Patrol to monitor illegal alien traffic.

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Notes:

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Table A-1
BMGR West INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
17.3	Participate and coordinate management activities with adjoining property owners that benefit natural resource management and participate in regional land-use planning opportunities to ensure consequences to BMGR natural and cultural resources are minimized.	O	The department works in cooperation with the BEC, ICC, MOG, and Pronghorn Recovery Team, and local, state, and federal governments to revise and improve management actions and policies.
17.4	Work with the county agricultural extension agents to determine the extent and danger of pesticide drift into BMGR and any associated resource issues.	N	This is no longer an issue because the Yuma Area Service Highway provides a buffer and there are no agricultural fields on the northern border of the BMGR-West.

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Notes:

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APPENDIX B

**BMGR EAST INRMP – MANAGEMENT ELEMENTS AND
STATUS OF ACTION PLAN ITEMS**

Appendix B

BMGR East INRMP – Management Elements and Status of Action Plan Items

The following 17 management elements were identified to be implemented in the INRMP. The Action Plan Items listed under each of the 17 management elements are the actions that were to be implemented with the 2007 INRMP. The Action Plan Items provide updated information on the status and progress for each action.

Note: the acronym definitions are provided in the List of Acronyms and are not repeated in this table.

Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items

Management Element and 2007 Action Items			
1	Resource Inventory and Monitoring <ul style="list-style-type: none"> • Ecosystem and limits of acceptable change monitoring systems will be developed and implemented for the BMGR and the extent and intensity of resource surveys will be increased. • Additional vegetation and wildlife surveys, in particular, will be conducted to monitor the ecosystem health and biodiversity. • Ecosystem monitoring will detect trends within the BMGR ecosystem that would indicate overall biodiversity and health. • 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. 		
	Action Plan Item	Status	Progress
1.1	Develop Inventory and Monitoring Plan	C	Plan completed in 2007.
1.2	Implement inventory and monitoring plan.	O	Established 92 stratified random sample points across the landscape then conducted a number of surveys at these and other locations for birds, vegetation, etc.
1.3	Amend the Inventory and Monitoring Plan to establish limits of acceptable change and adaptive management strategies.	N	Planning this effort for FY 2011 was too early; a few more years of maturity are needed for both BMGR East and that of BMGR West.
1.4	Implement cultural resource monitoring requirements for INRMP-related actions.	O	Progress has been made but action is ongoing and expected to continue into next 5 years. A team of volunteer Site Stewards monitor numerous sites in Area B of BMGR East; 56 RMO also continued to provide financial support to the Arizona Site Steward Program operated by the Arizona State Historic Preservation Office.

Status:

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- N = Not initiated

Notes:

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
1.5	Implement the provisions of the cultural resources programmatic agreement, which includes a phased cultural resource inventory based on prioritized survey areas.	O	Progress has been made but the action is ongoing and expected to continue into next 5 years, and measures required to avoid, minimize, or mitigate impacts to historic properties will be developed in consultation with the parties to the INRMP programmatic agreement. Conducted cultural resource surveys along about 100 miles of road in Area B, which is about half the total of 200 miles of public use in Area B. Work included recording presence of camp sites and fire rings. Thirty-nine newly recorded cultural resources have been determined eligible for inclusion on the National Register of Historic Places.
Management Element			
2	Special Natural/Interest Areas <ul style="list-style-type: none"> • The Flat-tailed Horned Lizard Habitat Management Area and the three previously designated ACECs will be redesignated as special natural/interest areas. • The two 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. • 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. 		
	Action Plan Item	Status	Progress
2.1	Define and designate the Mohawk Dunes Special Natural/Interest Area as required.	C	Completed in 2007.
2.2	Identify and evaluate other possible Special Natural/Interest Areas.	I	Exploring the logistics of developing a nature trail in the Crater Range mountains along SR 85.

Status:

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- O = Ongoing and Expect to continue
- I = Initiated but Incomplete
- N = Not initiated

Notes:

*May require further NEPA review and/or Section 106 consultation.

Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

Management Element			
3	Motorized Access and Non-roaded Area Management Redundant 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. <ul style="list-style-type: none"> • Of the 2,222 miles (3,576 km) of existing roads within the BMGR, approximately 30 percent, or 616 miles (991 km), will be closed at the percentages defined in the 2007 INRMP. See Figures 4 and 5 for the roads that will remain open. • Site-specific planning for two bypass roads (totaling approximately 7 miles, or 11 km) to reroute primarily Border Patrol traffic around rather than through the Cabeza Prieta NWR/Wilderness may be allowed to proceed should the USFWS, Border Patrol, or another agency develop the need and funding to establish these new roads. • 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. • Non-roaded areas of 3,001 acres (1,214 hectares) 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. There will be 78 such non-roaded areas within the BMGR. The largest of these, which occurs in BMGR-East, will be more than 102,000 acres (41,278 hectares); the largest non-roaded area within BMGR-West will be nearly 85,000 acres (34,398 hectares). 		
	Action Plan Item	Status	Progress
3.1	Close selected roads to public access where an agency mission or resource protection issues conflict with public use.	O	Imposed access restrictions in north portion of Area B resulting from new weapons safety footprints.
3.2	Evaluate site-specific proposals for future need and impacts of developing additional roads for agency purposes *.	N	Request from agencies or public did not materialize as previously expected. No requirements were identified.
3.3	Codify rules and establish schedule of fees for enforcing regulations.	N	Rules of conduct for visitors have been written, but not codified. This has been a lower priority because BMGR-East has a low volume of visitors.
Management Element and 2007 Action Items			
4	Camping and Visitor Stay Limits <ul style="list-style-type: none"> • Dispersed, self-contained camping (non-vehicle based) will continue to be allowed in all areas open to the public. • 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. Vehicles will continue to be allowed to pull up to 50 feet (15 meters) off the road, although campsites could be located farther from the road. • An assessment will be completed to determine the appropriateness of establishing designated camping areas. • Vehicle-based camping stays will continue to be limited to 14 consecutive days within a 28-day period except by special use permit. • 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. 		

Status:

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Notes:

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
4.1	Assess benefits and effects of establishing designated camping areas and implement a decision based on the findings.	I	Incomplete information available to make an assessment; existing sites are being recorded as part of cultural resources surveys along road corridors; survey work is approximately 50% complete.
Management Element and 2007 Action Items			
5	Recreation Services and Use Supervision <ul style="list-style-type: none"> • Public off-road vehicle travel and also on- and off-road racing will continue to be prohibited. • Motorized public travel in washes will be prohibited except where the wash is a designated part of the road system open to the public and is dry. • 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. • 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. • Visitors will continue to need a permit to access the BMGR. • New public education and recreation use programs will be developed and implemented to inform the public about road restrictions and resource sensitivities. • A minimum of six law enforcement officers will be retained and dedicated to the BMGR. • 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. • Signs, gates, and fences will be installed based on a needs assessment. Roads that are open to public use will be marked as open. If a road does not have a sign that indicates that it is open, drivers will have to consider it closed. • Recreation use records and statistics will be developed and maintained. • Recreational use of metal detectors and entry to mines will be prohibited. 		
	Action Plan Item	Status	Progress
5.1	Revise public visitation maps and rules for public education and recreation use; would inform the public about road restrictions and resource sensitivities.	O	The maps are revised annually, to include edits as necessary to the rules printed on the map reverse.
5.2	Hire law enforcement officers to be retained and dedicated to BMGR-East; interim measure consists of contract security guards with detention authority.	I	Contract security guards are in place; have been working with Manpower office since 2008 to establish authorizations for federal law enforcement officers but have made little tangible progress. The outlook is uncertain given projected AF-wide funding and Manpower reductions.
5.3	Install signs, gates, and fences to support road infrastructure and public access.	O	Installed approximately 45 signs at range entry points; developed and implemented a range-wide intersection numbering scheme totaling 180 intersection signs; signage installation complete.

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
5.4	Compile recreation use statistics, analyze use patterns, and identify heavily used areas. Monitor those areas to identify any resource concerns.	O	Range operations contractor tracks call-on and call-off data from recreational visitors; augmented in 2011 with new traffic counters installed at all Area B entry points.
Management Element and 2007 Action Items			
6	Rock Hounding <ul style="list-style-type: none"> Rock hounding 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. Rock hounding will be prohibited in other parts of the BMGR. 		
	Action Plan Item	Status	Progress
6.1	Not identified as an Action Plan Item in the BMGR INRMP 2007.		
Management Element and 2007 Action Items			
7	Wood Cutting, Gathering, and Firewood Use, and Collection of Native Plants <ul style="list-style-type: none"> 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). Woodcutting, 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. Woodcutting and wood gathering for purposes other than campfires will be prohibited throughout the range. Removal of wood from the range will also be prohibited. Collection or salvage of native plants will continue to be prohibited in accordance with the Arizona Native Plant Law. Collection of native plants will be allowed for protected Native American purposes. 		
	Action Plan Item	Status	Progress
7.1	Monitor native wood supplies in high-use areas; restrict wood collection if resource conditions dictate.	N	Change in priorities. No actions initiated but anecdotal evidence indicates firewood use rate is at sustainable levels.
Management Element and 2007 Action Items			
8	Hunting <ul style="list-style-type: none"> Existing game management programs will continue. An assessment will be conducted to determine whether 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. 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. 		

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
8.1	Assess the need for a fee-based special hunting permit program; revenues to be used for conservation.	N	Change in priorities, as it was determined that the level of effort would most likely exceed any revenue generated, thus deleting any benefit for conservation efforts. No actions were initiated.
	Action Plan Item	Status	Progress
8.2	Evaluate the effects of non-game species collection on wildlife, habitat, and other resources and, if indicated, limit or restrict collection activities within the authority of state law.	N	Change in priorities, as collection of species is not of a volume that would result in population declines or habitat degradation. No actions initiated.
Management Element and 2007 Action Items			
9	Recreational (Target) Shooting <ul style="list-style-type: none"> Recreational shooting will continue to be allowed under existing regulations as long as it is compatible with military use, public safety, and no significant resource issues are identified. A special use permit will be required to shoot between sunset and sunrise or to use automatic weapons. An assessment will be conducted on the appropriateness of recreational shooting on the BMGR, including the potential for designating specific shooting areas. 		
	Action Plan Item	Status	Progress
9.1	Assess importance and character of recreational shooting as an activity/issue to determine the appropriateness of this activity on the BMGR and implement a decision based on the findings.	N	Change in priorities, because recreational shooting is rare, and no actions initiated.
9.2	Consider designating specific shooting area(s).	N	Change in priorities, and no actions initiated.
Management Element and 2007 Action Items			
10	Utility/Transportation Corridors <ul style="list-style-type: none"> Construction of the Yuma Area Service Highway within a right-of-way that passes through the northwestern corner of BMGR-West will be allowed pending environmental analysis and approval. 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. 		
	Action Plan Item	Status	Progress
10.1	Establish a protocol consistent with NEPA and other regulatory requirements for reviewing/approving proposed actions within existing utility/transportation corridors.	C & O	Dialogue and partnership with regional agencies resulted in AF participating in development or review of various initiatives. Action is ongoing and expected to continue into next 5 years.

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
10.2	Coordinate with Civil Engineering Real Property to restrict future utility and transportation corridors to the existing State Route 85 and railroad rights of way.	C & O	Completed reviews of proposed actions within the ROW: new fiber optic lines, replacement of utility poles, and construction of temporary Border Patrol checkpoint. Action is ongoing and expected to continue into next 5 years.
Management Element and 2007 Action Items			
11	General Vegetation, Wildlife, Wildlife Habitat, and Wildlife Waters <ul style="list-style-type: none"> • Procedures will be developed to control all trespass livestock grazing. • Actions will be taken to prevent, control, and eradicate the spread of invasive species commensurate with the threats these species pose to natural resources. • Restrictions on activities will be implemented in key areas if needed to protect and conserve habitat, ecosystems, or biodiversity. • Areas damaged by a discontinued military, agency, or extensive public use will be restored by passive or active management actions. • 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. 		
	Action Plan Item	Status	Progress
11.1	Monitor and control invasive species.	O	Completed annual monitoring, performed control on 40-acre tumbleweed infestation; co-funded a University of Arizona PhD candidate to conduct Sahara mustard ecology research; conducting detailed multi-year monitoring of buffelgrass along SR 85 to assess its potential to spread onto BMGR East. Provided letters of support and coordination for two multidisciplinary Strategic Environmental Research and Development Program project research grant projects on the ecology of invasive weeds, one for Schismus grass and one for Sahara mustard.
11.2	Habitat restoration *.	N	No active restoration has been initiated; passive restoration is in progress at areas where unauthorized vehicle trails have been signed as closed.
11.3	Evaluate benefits and adverse effects of wildlife waters.	I	Did not complete a holistic review. Supported several assessments at wildlife waters to help fill data gaps: extensive use of wildlife cameras at waters; identified bat species composition at waters; funded a Texas Tech University study to evaluate geographical connectivity of wildlife waters and effect on amphibian and odonate diversity; and funded an ASU graduate project to evaluate wildlife water impact on small mammal composition.

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
11.4	Develop and implement procedures to control all trespass livestock.	O	Installed approximately 1,200 feet of fencing in the southwest corner of Area B, but it resulted in limited beneficial effect.
11.5	In the first five years of the INRMP, allow for the maintenance and repair of existing water developments *.	O	Supported AGFD annual maintenance of all waters and redevelopment of six waters; completed natural/cultural resource compliance assessments for one more.
11.6	Support AGFD installation of up to a total of six high-priority wildlife waters on the BMGR *.	I	Request from agencies or public did not materialize as previously expected. Awaiting AGFD initiation. A new Halliwill catchment was installed in Feb 2012. AGFD has identified a second proposal for a wildlife water catchment, but its development has not been scheduled; natural/cultural resource compliance assessments for both locations are complete.
Management Element and 2007 Action Items			
12	Special Status Species <ul style="list-style-type: none"> • All existing and future compliance requirements for the protection and conservation of special status species will be met and supported. • 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. • Habitat improvements will be made in support of endangered species recovery plans. • Resources will be provided, as necessary, for predator control to protect a special status species. 		
	Action Plan Item	Status	Progress
12.1	Participate and implement recovery actions of the Sonoran Pronghorn Recovery Plan.	O	Pronghorn recovery actions fully supported.
12.2	Evaluate, monitor and protect important bat roosts.	O	Funded AGFD to monitor roosts in 2005 and 2009.
12.3	Codify rules and establish schedule of fees for enforcing regulations.	N	Rules of conduct for visitors have been written, but not codified. This has been a lower priority because BMGR-East has a low volume of visitors.
Management Element and 2007 Action Items			
13	Soil and Water Resources <ul style="list-style-type: none"> • Measures will be taken to continue to prevent soil erosion, water pollution, and groundwater depletion. • 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. • 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. 		

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
13.1	Evaluate erosion conditions of range roads; repair or temporarily restrict use *.	O	All range roads driven and evaluated annually.
13.2	Monitor water table levels.	O	Completed by range operations contractor.
Management Element and 2007 Action Items			
14	Air Resources <ul style="list-style-type: none"> • Actions will continue to be taken to control fugitive dust at construction sites and to prevent non-point source air pollution. 		
	Action Plan Item	Status	Progress
14.1	Control excessive fugitive dust at permitted construction sites and recreation activity areas.	O	Completed by range operations contractor.
14.2	Develop Best Management Practices for activities with potential for generating non-point source pollution.	N	Point source pollution, such as painting targets and burning wooden target debris, is subject to the BMPs and stipulations in the permits that the range operations contractor receives from either ADEQ or Maricopa County. No further action was warranted nor initiated.
Management Element and 2007 Action Items			
15	Visual Resources <ul style="list-style-type: none"> • The effects of new actions on visual resources will continue to be considered with a focus on minimizing degradation of scenic views. 		
	Action Plan Item	Status	Progress
15.1	Not identified as an Action Plan Item in the BMGR INRMP 2007.		
Management Element and 2007 Action Items			
16	Wildfire Management <ul style="list-style-type: none"> • 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. 		
	Action Plan Item	Status	Progress
16.1	Develop fire management plan.	I	Funded Tonto National Forest to prepare plan; final draft submitted in Sep 2011; to be completed by BMGR East staff.
Management Element and 2007 Action Items			
17	Perimeter Land Use, Encroachment, and Regional Planning <ul style="list-style-type: none"> • 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. 		

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Table B-1
BMGR East INRMP – Management Elements and Status of Action Plan Items
(continued)

	Action Plan Item	Status	Progress
17.1	Participate in local and regional planning and monitoring land use patterns.	C & O	Reviewed several environmental assessments or impact statements, resource management plans; 56 RMO personnel serve as DoD liaison for energy development proposals in Arizona. Action is ongoing and expected to continue into next 5 years.
17.2	Monitor illegal immigration to anticipate how BMGR resources may be affected.	O	Monitored via ongoing coordination with USBP, routine range patrols, and direct observation reports from range personnel. Removed dozens of abandoned vehicles and bicycles, cleaned up several large trash piles.

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