ARIZONA, CALIFORNIA

MARINE CORPS AIR STATION YUMA



NATURAL RESOURCES PROGRAM OVERVIEW

Marine Corps Air Station (MCAS) Yuma is the busiest air station currently utilized by the United States Marine Corps (USMC) and serves as a base of operations for Marine Aviation Weapons and Tactics Squadron-1, which trains aircrews and support personnel in advanced aviation warfighting techniques. With management responsibility for both the Chocolate Mountain Aerial Gunnery Range (CMAGR) and the Barry M. Goldwater Range-West (BMGR-W), MCAS Yuma is presented with the unique challenge of managing natural resources on more than 1.1 million acres of land-the most of all USMC installations.

The foundation for meeting this challenge begins with each range's Integrated Natural Resources Management Plan (INRMP), a long-term strategic plan required by the Sikes Act Improvement Act of 1997. Implementation of INRMPs not only protects the long-term sustainability of natural resources occurring on CMAGR and BMGR-W, but also serves to support the military's combat readiness mission by ensuring continued access to realistic training conditions. Additionally, MCAS Yuma Natural Resource staff provide regulatory guidance and oversight for biological resources relating to all activities conducted on lands within the installation's management authority.



* All photographs are sourced from the USMC unless noted otherwise. Top photos (from left): Sonoran pronghorn on BMGR-W; Western shovelnose snake in the Mohawk Dunes on BMGR-W; Mojave desert tortoise (Kurt Moses, NPS).

FACTS AT A GLANCE

CMAGR



KEY HABITATS

- » Creosote bush-scrub
- » Elephant tree-limberbush on xeric rocky slopes
- » Paloverde-cacti and scrub

PROGRAMS

- » Invasive Species Management
- » Threatened & Endangered Species Management
- » Fish and Wildlife Management
- » Ecosystem Management
- » Recreation Management

AIRFIELD AGRICULTURAL LEASE PROGRAM

Approximately 1,500 acres of land surrounding the MCAS Yuma airfield is leased for agricultural production, which directly supports the mission success of the installation, BMGR-W, and CMAGR. The agricultural lease program allows managers to control land management and development activities adjacent to the airfield. This allows the installation to manage Bird/Wildlife Aircraft Strike Hazard (BASH) risks near the airfield, which supports pilot safety and reduces the potential for significant damages to aircraft from BASH. Revenue streams generated by the agricultural lease program help to fund projects identified in the INRMPs, which further support the effort to sustain the training environment on BMGR-W and CMAGR.



MCAS Yuma soil technician in leased agricultural field.



Conservation Partnerships

MCAS Yuma collaborates closely with two partnership forums, the BMGR-W Executive Council (BEC) and the Intergovernmental Executive Committee (IEC). The BEC includes representatives from all neighboring federal and state land management agencies and is focused on leveraging the collective knowledge of the group to develop solutions to localized issues that may affect military training on the BMGR-W. In conjunction with the BEC, the IEC engages the public and special interest groups to exchange views, address concerns, disseminate information, and generate discussions relating to the management of natural and cultural resources throughout the region. Through the BEC and IEC, collaborative resolutions to potential natural and cultural resources issues and other land management issues can be achieved before negatively impacting the military mission at BMGR-W.

ENVIRONMENTAL RESILIENCE

Both BMGR-W and CMAGR are located within an arid desert climate, which observes extremely hot summers and mild winters with very little annual precipitation. Climate projections anticipate a continuation of these trends resulting in even warmer winters and hotter summers. MCAS Yuma hosts and maintains wildlife water catchments throughout both ranges to ensure valuable drinking water availability to wildlife during the summer and intense periods of drought. The catchments store rainwater in underground tanks and provide water to wildlife via troughs. Wildlife use these water sources throughout the year, not just during summer months. As the effects of climate change result in hotter seasons and increased periods of drought, there will likely be increased dependency of these catchments by wildlife.





MCAS YUMA CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

PROGRAM HIGHLIGHTS

The CMAGR is located within the transitional zone between the Sonoran and Mojave Deserts of in southeast California. Its terrain is characterized by alternating rocky uplands with slopes up to 90 percent, and low valleys with broad alluvial plains, washes, and dry lakebeds. Ancient lava fields are significant features of some training areas.

The CMAGR is used primarily for live-fire training in an environment that simulates a tactically diverse and complex air-ground battlefield. Ground combat activities are conducted on the CMAGR in support of aviation training. The CMAGR is closed to public access due to safety, security, and military mission priorities.

VEGETATION MAPPING

Baseline vegetation surveys help natural resources managers monitor species and habitat, gauge changes over time, and identify issues or trends before they become future constraints. A range-wide vegetative community map of CMAGR, which is nearly complete, will assist natural resource managers in identifying rare and/or sensitive vegetation types for future land management planning. A flora collection (herbarium) will be compiled, with specimens archived for future plant identification purposes.



Target complex on CMAGR with the Chocolate Mountain Range in the background.

MAINTAINING BIODIVERSITY

The Sonoran Desert is the most biologically diverse desert in the United States, and the Mojave Desert also supports a rich diversity of plant and animal species. Baseline surveys for small mammals, reptiles, and amphibians were recently completed on the CMAGR to capture biodiversity and distribution of these species. Results of this survey will help guide future monitoring and natural resource stewardship in support of the mission of the CMAGR. The surveys show that there has been no decline in the biodiversity of the CMAGR over the past 40 years. The enduring biodiversity of the range with no additional species requiring special status is a large benefit to both natural resources and the military mission at the range.



Top: Chuckwalla found on CMAGR. Bottom: American badger kit. *Photo credit: Sally King, NPS*

FEDERALLY LISTED SPECIES

THREATENED SPECIES

Mojave Desert Tortoise Gopherus agassizii



MOJAVE DESERT TORTOISE

Photo Credit: B. Michel, NPS

The Mojave desert tortoise is a large, elusive, herbivorous reptile found throughout much of the Mojave and Sonoran Deserts. In 2011, desert tortoises were reclassified into separate species based upon their geographic location to the Colorado River (east or west). Desert tortoises spend up to 95 percent of their life underground in burrows. Primary threats to tortoise populations are habitat loss and degradation, which have been impacted by agricultural and residential development. Other threats include illegal collection, upper respiratory disease, and the predation of juveniles by ravens. Tortoises on CMAGR are tracked monthly, and annual surveys help determine population densities.

CMAGR CONSERVATION SUCCESSES

12 MOJAVE DESERT TORTOISES tracked monthly on CMAGR

MOJAVE DESERT TORTOISE CONSERVATION

For over 20 years, MCAS Yuma has been dedicated to supporting the recovery of the Mojave desert tortoise. Since the range is primarily aviation-based, natural resources personnel are able to maintain quality habitat for the tortoise with minimal ground disturbance from military training activities. Annual surveys are conducted within the critical habitat (187,842 acres) to determine population densities and long-term trends of the desert tortoise. These surveys are conducted in cooperation with the U.S. Fish and Wildlife Service Desert Tortoise Recovery Office. In a typical year, 34 twelve-kilometer transects (totaling 408 km) are surveyed for the tortoise. At the northwest corner of CMAGR, a total of 12 desert tortoises are tracked annually through telemetry. The telemetry assists the survey team on the typical behavior of the tortoises (above- and belowground, which helps to extrapolate population data to closely monitor population trends within the CMAGR critical habitat.

In addition to funding and assisting with annual surveys for desert tortoise, MCAS Yuma conducts pre-project clearance surveys to ensure that the desert tortoise is protected during military training and construction activities. MCAS Yuma has a Biological Opinion with specific guidance and mitigation to support recovery efforts for the desert tortoise. The positive results of these efforts are shown through the annual surveys, with the CMAGR stratum producing some of the highest desert tortoise densities in the entire recovery unit.



First-year desert tortoise captured on CMAGR trail camera.



NUMEROUS CONSERVATION MEASURES in place to offset any training impacts on natural resources

SUPPLEMENTAL WATER SOURCES

provide water to wildlife on CMAGR year round



CMAGR, in partnership with the U.S. Fish and Wildlife Service, is exploring the potential reintroduction of endangered Sonoran pronghorn on the range. A population of Sonoran pronghorn introduced to CMAGR would be a 10J "Non-Essential Population" meaning that the population would support overall recovery of the pronghorn and potentially create a new population base, without creating new mission constraints on CMAGR. If successful, the population could ease constraints associated with the Sonoran pronghorn population supported on BMGR-W.

MCAS YUMA BARRY M. GOLDWATER RANGE-WEST

PROGRAM HIGHLIGHTS

BMGR-W is a significant part of the largest remaining tract of relatively unfragmented and undisturbed Sonoran Desert. The range is home to numerous rare plants and wildlife, including the endangered Sonoran pronghorn and the iconic saguaro cactus. The region surrounding BMGR-W is rural and undeveloped, consisting mainly of federal public lands.

BMGR-W is one of the largest tactical aviation training ranges for the USMC and is host to the biannual Weapons Tactics Instructor (WTI) course. The range provides the necessary space and infrastructure for Marines to receive critical tactical aviation training (air-to-ground and air-to-air) and associated ground support training. Nearly 80 percent of Marine Corps Aviation units train at the BMGR-W before deployment.

INVASIVE PLANT SPECIES MANAGEMENT

Delicate native plant communities on BMGR-W are under constant assault by non-native invasive species, such as the Sahara mustard and buffelgrass, which displace native plants and bring a relatively new fire potential to the Sonoran Desert. If left unchecked, invasive weeds can have landscape-level-impacts that can negatively impact training tempo and threaten military infrastructure.

To combat these effects, MCAS Yuma has partnered with the University of Arizona (UA) to map, control, and monitor noxious weeds throughout the BMGR-W using a range of modern technologies and UA expertise to collaboratively manage invasive plants. To date, MCAS Yuma has been able to successfully eradicate 90 percent of buffelgrass infestations documented on the range.

PUBLIC RECREATIONAL ACCESS

Approximately 75 percent of the BMGR-W is open to regulated public use by the local and visiting community. Popular activities include camping, hunting, target shooting, hiking, and off-highway vehicle use on designated roads and trails. MCAS Yuma annually issues over 8,000 public recreation permits, which are required for range access. Providing recreational access that does not conflict with military training allows MCAS Yuma to generate support from the greater Yuma community for the USMC and its mission.

CONSERVATION LAW ENFORCEMENT OFFICERS

MCAS Yuma CLEOs serve as the eyes and ears of the range for conservation enforcement while also resolving human/ wildlife conflicts and supporting many natural resource conservation activities. CLEOs work closely with both the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department to enforce state and federal laws and regulations for wildlife management. The CLEOs also work with the U.S. Border Patrol to help minimize impacts to the training ranges and its natural and cultural resources from drug smugglers, undocumented individuals, and associated U.S. Border Patrol interdiction operations.

FEDERALLY LISTED SPECIES

ENDANGERED SPECIES

Sonoran pronghorn *Antilocapra americana sonoriensis*





MCAS Yuma personnel and volunteers at an even to remove invasive buffelgrass.

SONORAN PRONGHORN

With its small size and light coloring, the Sonoran pronghorn is uniquely adapted for the desert. Native to the Sonoran Desert, it is locally referred to as the "desert ghost" due to its elusive behavior and speed. Threats to this genetically distinct subspecies include disturbances due to illegal immigration and border security, predation, drought, and barriers that fragment habitat and prevent movement (such as fences and roads). Approximately 219,115 acres of habitat for Sonoran pronghorn exists on BMGR-W, and MCAS Yuma natural resources staff carefully implement recovery efforts on the range in coordination with partners and range operations staff.

BMGR-W CONSERVATION SUCCESSES

219,115 ACRES

of protected Sonoran pronghorn habitat

114,800 ACRES of protected flat-tailed

horned lizard habitat

SONORAN PRONGHORN CONSERVATION

Nationally, the Sonoran pronghorn once numbered in the thousands but due to drought and other factors, the population has dwindled to a few hundred. BMGR-W provides substantial habitat for Sonoran pronghorn. In conjunction with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, U.S. Air Force, and others, MCAS Yuma has engaged in a major initiative to recover the species. Pronghorn recovery projects include maintaining the sparse remaining habitat within the species historic range, providing watering catchments during droughts, supporting native vegetation and supplemental feeding stations to ensure forage availability, maintaining two captive breeding facilities, and establishing nonessential experimental populations on sites other than BMGR-W.

In 2002, the Sonoran pronghorn population dwindled to 21 individuals in the United States. Due to the extensive efforts of a multi-agency recovery team, the population has rebounded to over 400 individuals. MCAS Yuma staff carefully implement pronghorn recovery efforts on BMGR-W in coordination with the recovery team and BMGR-W range operations to minimize impacts to, and to better support, BMGR-W's training and testing activities. The increases in pronghorn population numbers have benefited MCAS Yuma's mission by reducing the likelihood that the mission would be limited further by declining pronghorn populations. Long-term conservation efforts could further support recovery of the species, which would further reduce impacts to the military mission by downlisting and/or delisting the species.

100% OF SURVEYED

INVASIVE PLANTS TREATED with over 90% eradication of buffelgrass on the range

SUPPLEMENTAL WATER SOURCES

provide water to wildlife on BMGR-W year round

75% of BMGR-W

open for public recreation

MOHAWK DUNES

FRINGE-TOED LIZARD

In 2020, a scientific paper confirmed

that fringe-toed lizards found in the

Mohawk Dunes on BMGR-W warrant a

taxonomic revision: the "new" species was named Mohawk dunes fringe-

toed lizard (Uma thurmanae). Previous

surveys documented more than 100



FLAT-TAILED HORNED LIZARD

The flat-tailed horned lizard (FTHL) *Phrynosoma mcallii* is endemic to the Sonoran Desert. BMGR-W manages 114,800 acres of FTHL habitat as part of the Yuma Desert Management Area for this species. In conjunction with

management efforts across the FTHL range have contributed significantly to precluding federal listing of this species, thus avoiding additional regulatory encroachment on military training while supporting long-term sustainability of BMGR-W.



Photo credit: Andrew Gottcho

observations of what was previously thought to be the Yuman desert fringetoed lizard (*Uma rufopunctata*) occurring in the Mohawk Dunes, suggesting that the population of the new species is relatively stable. MCAS Yuma is leading a joint effort with the U.S. Air Force to study *Uma thurmanae*, define and map distribution of the species, assess the current population status, collect additional genetic material, and document existing and potential

species. In conjunction with observations of state and federal partners, toed lizard (Uma