



PROTECTING RESOURCES



Natural Resources
Conservation

NATURALLY

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Delicate desert beauty evident in the spring

If it wasn't for the desert's unique natural resources, Edwards Air Force Base (AFB), Calif., might not be here. In the 1930s, when the military sought a place to test experimental aircraft, no other area in the United States could compare to the remote natural runways offered by the dry lakebeds.

Because the lakebeds are such important and prominent features in our desert landscape, there is often a tendency to pass over the surrounding landscape as dry and lifeless. In fact, these areas are home to a great diversity of plant and animal species.

Considering the relative starkness of the 301,000 acres Edwards occupies, it is difficult to believe more than 200 species of birds, 300 varieties of plants, and at least 19 species of reptiles and 30 different mammals have been observed and documented on Edwards.

Attitudes and approaches



The desert tortoise, above, and the Joshua tree, below, are perennial inhabitants of the Mojave Desert, Calif.

toward managing the natural resources on Edwards have changed considerably from the early years. Decades of research, inventories and studies have shown the diversity and vulnerability of the desert ecosystem. The desert is home to a wide array of specially adapted, interdependent populations of plants and animals.

Most of the undisturbed

areas of the base fall into one of seven habitat communities; Joshua tree woodland, Mesquite woodland, creosote bush scrub, xerophytic phase saltbush scrub, halophytic phase saltbush scrub, cheesebush scrub, and playas and lakebeds. These habitats are comprised of both living and nonliving elements that maintain an intricate balance to sustain desert life.

Even the lakebeds and claypans, dry and apparently lifeless much of the year, teem with life after winter rains. The rains allow freshwater shrimp to hatch, which in turn

attracts a host of native and migratory birds.

As responsible environmental stewards, the Air Force considers the diversity and sustainability of a wide variety of ecosystems at all bases while conducting their primary mission. In accordance with Air Force Instruction 32-7064, an Integrated Natural Resources

For more information, visit our website at www.edwards.af.mil.

You may contact the Environmental Management at
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Common Pests at Edwards

A "pest" is anything that competes with humans, domestic animals or desirable plants for food or water; injures humans, animals, desirable plants, structures or possessions; spreads disease to humans, domestic animals, wildlife, or desirable plants; or annoys humans or domestic animals.

The Integrated Pest Management Program, employed by the Air Force, strives to use methods that are safe to humans and pets, and gentle to the environment.

At Edwards, if you need help controlling invasive species, contact the following offices: Housing residents may call Military Family Housing at 277-4506. Commercial building residents may call Civil Engineering at 277-2431. NASA may call 258-3839.

Management Plan was developed at Edwards. The management plan serves as a guidance document that integrates mission activities with natural resource sustainability. This is done by properly managing these resources, while ensuring the Air Force's defense mission requirements are met. This proactive approach to resource management ensures environmental issues are addressed before they impact the military mission. By ensuring compliance with state, federal, and local laws, the plan allows the base to advance its mission objectives while preserving natural resources.

The Environmental Management (EM) Directorate's primary responsibility is to manage natural resources at Edwards AFB. EM is also responsible for conservation and management of fish and wildlife, grazing and cropland, forestry, research,



Wild flowers in the springtime at Edwards AFB

pest management, and certain outdoor recreation activities (such as hunting and fishing). In addition, EM personnel coordinate project planning and implementation with other organizations on base. The directorate also reviews project

plans and environmental impact analysis process documentation to ensure compliance with applicable natural resources regulations.

Education and Research

Educating base employees, residents, students, and visitors on how to live and work among our local natural resources is an important function for the Natural Resources section. EM's educational outreach program is provided by a variety of media. This includes publishing informative articles in the base and local newspapers, displaying information on the local television station, developing and distributing brochures and handouts, providing speakers and displays for base functions, and providing environmental awareness training to base personnel. An average of a hundred new individuals receive an environmental awareness briefing each month.

Education and awareness have proven to be a cost-effective management tool. This tool informed individuals of their responsibilities, and helped foster an appreciation for the desert environment.

Research is an important part of the management approach of Natural Resources.

Studies on the populations of animal and plant

species and the habitats in which they live help biologists understand what impacts the human presence is having on them. Human impacts on the local desert environment are not always obvious. Although the destruction of habitat for military projects and human inhabitation can make an obvious impact on the environment, some sources of trouble are not as apparent. For example, major roads must be carefully planned because they can act as barriers to some species. This sometimes prevents certain species from reaching important resources or separates them from potential mates. EM recognizes that understanding human impacts on the plant and animal species of Edwards AFB requires monitoring. Research efforts include periodic inventories of plant and animal communities and individual species, animal behavioral studies, and studies designed to track and increase the base's desert tortoise population. Using this research, the Natural Resources section can better understand the health of the ecosystem and manage resources.



Mohave Ground Squirrel (*Spermophilus mohavensis*)



Sensitive Species at Edwards AFB

Edwards AFB provides habitat for one permanent resident species listed under the *Endangered Species Act*, the desert tortoise. The desert tortoise is a state and federally “Threatened” species and holds the title of California state reptile.

Desert tortoises are large, herbivorous (plant eating), terrestrial reptiles. They have a hard-domed shell, elephant-like front legs, claws for burrowing, and a short tail. They have an estimated lifespan in the wild of up to 50 years, with a lucky few surviving as long as a hundred years. Their offspring are vulnerable to predators because their shells do not harden until five to seven years after they hatch. In the wild, tortoise that reach adulthood have a very good survival rate.

The Mojave population of desert tortoise is native to this area and can be found living on sandy flats and rocky

hillsides. The U.S. Fish and Wildlife Service (USFWS) has designated almost 20 percent of Edwards as Desert Tortoise Critical Habitat. This area requires special management considerations and has been deemed essential for the conservation of the species.

Another resident of Edwards is the Mohave ground squirrel, which is classified as “Threatened” by the State of California and is a Federal “Species of Concern.” Additional animal and plant species of special concern that occur naturally to Edwards include the American badger, Barstow woolly sunflower, desert cymopterus and alkali mariposa lily, to name a few. A variety of federally protected birds also spend time at Edwards during their seasonal migrations, including several species of hawks, falcons, owls, and eagles.



Burrowing Owl
(*Athene cunicularia*)

Project Support

Each year, many projects are undertaken to support the Edward’s mission. Each project receives an environmental review in accordance with the *National Environmental Policy Act*. As part of the environmental review process, the Natural Resources section provides input during each step of a project’s planning and development phase. This ensures natural resource concerns are addressed early in the planning stage. The Natural Resource section supports infrastructure maintenance and development, test programs, the National Aeronautics and Space Administration (NASA), and all other Department of Defense (DoD) related programs.

When EM personnel determine a project may adversely effect federally threatened or endangered species, a document called a “biological opinion” must be obtained from the USFWS. This document provides measures to the project proponent to minimize potential impacts to the desert tortoise or its habitat.

Birds on the Flightline

Birds can be considered pests, too, especially on the flightline. Birds can jeopardize the safety of pilots, cause millions of dollars in damage to experimental and training aircraft, and may cause substantial delays to flight operations. To minimize impacts from birds, the Natural Resources section participates in the Bird Aircraft Strike Hazard, or BASH, program. The BASH program helps reduce hazards by training personnel, conducting research on Edwards’ bird populations, and using the knowledge gained from other programs to make effective BASH reduction policies.

By studying the ecology and distribution of birds at Edwards, Natural Resources management personnel can advise flightline management personnel on the most effective methods of reducing the potential for bird strikes.



Bobcat (young)
(*Felis rufus*)



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Piute Ponds
Edwards AFB, Calif.

Environmental Management

Supporting Edwards Air Force Base through sound environmental stewardship

Mojave Desert Ecosystem Initiative

The DoD has sponsored a program known as the Mojave Desert Ecosystem Initiative. This program is designed to support the continued capability of missions critical to DoD installations within the Mojave Desert while protecting the environment.

A partnering effort between many federal, state, and public agencies, including National and State Park Services, military bases, Bureau of Land Management, and others.

The Mojave Desert

Ecosystem Initiative has compiled information about topographical features, plants and wildlife, soil composition, and land usage. Using advanced mapping software; the data has been entered into a Geographic Information System. Through computer networks and the Internet, the information is available to those involved in the project, as well as to the public.

The ability to create maps and reports that combine this information facilitates many useful activities such

as predicting the locations of sensitive species, monitoring the impact of individual projects, and keeping track of plant and animal population trends. The information has proved useful in accurately predicting where certain sensitive plant species are located at Edwards. Knowing the location of “sensitive” species is especially important to help protect them from becoming a threatened or endangered species.

By combining the input of multiple agencies into a single



Coyote
(*Canis latrans*)

database, the Mojave Desert Ecosystem Initiative provides an important tool that aids in making predictions about and monitoring trends in the local ecosystem.