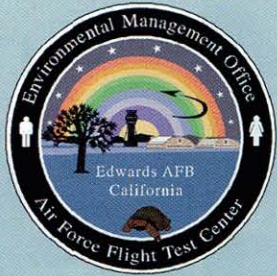


October 1996



FACT SHEET

Conservation

**Air Force Flight Test Center
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EDWARDS AFB ENVIRONMENTAL MANAGEMENT OFFICE

PRESERVING THE FUTURE



Edwards Air Force Base is recognized as the premier flight test facility in the world and a leader in the development of technology.

The Department of Defense's flight test mission here must be accomplished with sound environmental stewardship always in mind.

In administering that stewardship, the Environmental Management Office is supported by four pillars: Restoration, Compliance, Pollution Prevention and Conservation.

The responsibility for helping planners design environmentally-conscious projects rests upon the conservation pillar. This organization ensures the job gets done effectively with the least harm to the environment, so all options are considered before a new project or action is considered.

The Conservation Branch approaches environmental management through impact analysis and planning, consideration of natural and cultural resources and the effective use of the Geographic Information System (GIS).

When an extensive fiber-optic system was proposed to move on-base communications into the next century, it was a large project which required substantial planning and assessment of environmental impacts. This project is typical of how the conservation program works at Edwards AFB.

ABOVE,
workers
install fiber
optic cable
beneath
Rogers Dry
Lake Bed.



Workers trench across Rogers Dry Lake to install fiber-optic cables.

Weighing the options

Environmental Impact Analysis Process

In 1969, many Americans asked that our government publicly address concerns about the environment. They wanted to be informed about the use of federal lands and the effect on their lives.

In answer to this, Congress passed the National Environmental Policy Act (NEPA), which became law on Jan. 1, 1970.

A "procedural" law, the NEPA process is designed to ensure that stewards of federal lands, such as Edwards AFB, consider every relevant aspect of the environmental impact of an action or project. In addition, the law has a built-in requirement for informing and involving the public in the decision-making process.

Congress mandated full disclosure of environmental impacts by public agencies in hopes that it would lead to wise decision-making.

An honest effort

NEPA requires federal agencies to be candid. It also promotes wise planning that serves to minimize damage to the human environment. Under NEPA, the human environment includes both cultural and natural resources.

Through NEPA, agencies are provided a method in which to document the planning and decision-making stages of this "analytical thinking process," thus reducing the likelihood of adverse environmental impact and possible litigation.

"It's an excellent planning tool," said Christopher Rush, lead environmental planner and an expert on NEPA and the Environmental Impact Analysis Process (EIAP). "NEPA is a procedural guideline that gives you extra insurance," he said. "If you follow the process correctly, it will more likely result in an environmentally friendly effort." EIAP is the process used by the Air Force to implement NEPA.

How complex is it?

The first step is to determine if a proposed project might cause an impact significant enough to require a more detailed look into its short-term and long-term effects on the environment. If a project doesn't cause a significant impact, it will qualify for one of several defined "categorical exclusions" (known as CATEXs) and it can be exempted from a more detailed environmental assessment.

"We take a look at each project and see what kind of environmental issues are involved," said Rush.

For example, the installation of the fiber-optic project, known as the Base Information Digital Distribution System (BIDDS), was immediately identified as being too complex to qualify for a categorical exclusion.

It was a massive undertaking. To lay the cable it was necessary to plow a furrow through Rogers Dry Lake.

"If you follow the process correctly, it will more likely result in an environmentally friendly effort."

In addition, there were several buildings, some more than 50 years old, that needed to be modified or demolished to make way for the new system, and natural resource issues to be considered. It would require a more detailed analysis.

What if it's not on the list?

Each federal agency, including the Air Force, maintains a list of "categorical exclusions in the absence of unique circumstances." These are applied to repeated procedures which, over time, have been proven to have no significant impact on the human environment.

If the BIDDS project had no unique circumstances, a detailed investigation into its environmental impact would have been unnecessary, because it would have met the following CATEX:

Installing, operating, modifying and routinely repairing and replacing utility and communications systems, data processing cable and similar electronic equipment that use existing rights of way, easements, distribution systems or facilities.

If the BIDDS project had involved only an upgrade to the existing communication lines, then it may have qualified for this CATEX. In fact, an upgrade was one of the alternatives explored in the Environmental Assessment. The analysis of alternatives is an essential part of the NEPA process.

What's the alternative?

If the project doesn't qualify for a CATEX, then an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) must take into account all practical alternatives to the proposed action. Both long-term and short-term effects *within context* are considered.

"We were pretty certain that the BIDDS project needed at least an EA," said Rush. "It was a big project with a variety of potential impacts."

The issues looked at included those pertaining to natural and cultural resources and also the issue of

contaminated soil discovered during the construction.

Has the area been surveyed for the desert tortoise? If workers run into an archaeological site, what measures can be taken to recover or protect it? Do any buildings scheduled for modification contain asbestos or lead-based paint? Is the project near a known site with contaminated soil or groundwater, or a site identified for cleanup under the Installation Restoration Program?

Questions such as these, as well as alternatives to the proposed action, are brought up and addressed in the EA (or the more detailed EIS), which is then routed to an array of potentially-affected public agencies, ranging from the U.S. Fish and Wildlife Service to the California Department of Toxic Substances Control and private groups.

Where possible, mitigations to reduce impacts to levels less than "significant" are offered for those issues brought forward in the EA. If the mitigations are acceptable, then an EIS will not be necessary. Work on the project can now begin.

What's the next step?

When the EA is completed, most projects need go no further in the NEPA process than a "Finding of No Significant Impact."

However, if the potentially significant effects on the environment are such that an Environmental Impact Statement is required, the project qualifies as a major federal action. This means even greater in-depth analysis is necessary. •



Protecting natural resources preserves the Edwards mission

It may be a desert, but it's not a wasteland. "There are more than 200 species of birds, more than 200 varieties of plants, 30 different kinds of mammals," said Mark Hagan, wildlife biologist and natural resource manager.

These resources, as part of the greater ecosystem on Edwards Air Force Base, must be managed responsibly.

As part of the federal government, Edwards has accepted the stewardship and responsible management of an ecosystem that includes dry lakes and a man-made freshwater marsh, desert tortoises, several different species of owls and the occasional bald eagle, our national bird.

Mission critical

As a flight test center, a great deal of the Edwards mission depends heavily upon its natural resources.

"If the ecosystem and associated resources are managed, the mission will benefit from it, too," said Hagan. "It will give us greater flexibility."

"The dry lakebed is of primary importance to us," said assistant natural resource manager Wanda Deal.

That's why, every time an action or project could have a negative effect on the desert environment, the natural resources division becomes integral to the environmental analysis process.

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Careful planning

The division assists in the planning process of base projects, as well as educating the public about the natural resources at Edwards and continuing to increase its knowledge base of those resources through research.

During the BIDDS project, in which fiber-optic lines were to be installed beneath the lakebed and through undeveloped desert habitat, the possibility for negative impact could have been high — especially on the desert tortoise, a species listed as threatened under the Endangered Species Act, which is enforced by the U.S. Fish and Wildlife Service.

“We have to look at the species, as well as the habitat,” said Deal.

Taking inventory

Research is an important part of this management.

“Research helps us understand how large these populations are and what impact we’re having on them,” said Deal. “We can only manage the resources if we have the necessary information about the plants and animals which live here.”

Inventory of wildlife, a study on the lakebed, clay pan and sand dune system, and the correlation of the methods to determine desert tortoise density are just a few of the diverse research projects currently underway.

“In order to make good recommendations to project proponents, we need to know what species and processes are here and how they interrelate,” said Deal.

Sharing the knowledge

Another important function of the natural resources division is to educate base residents, students, workers and visitors about how to live and work among our local natural resources.

“Educating children who live on base has really reaped benefits,” said Deal. “They go home and help their parents understand the desert and its inhabitants.

“Education is one of the most important and cost effective management tools we have.”

Tortoise Awareness

When a project, such as BIDDS, is routed through a sensitive natural resource area, a biological opinion must be provided by the U.S. Fish and Wildlife Service and incorporated into the Environmental As-

essment as part of the NEPA process. Because the desert tortoise is a threatened species and mishandling could result in heavy fines or imprisonment, workers on a project must be educated how to protect the animal and its habitat.

However, sometimes more than education is needed and a biologist is assigned to monitor the project, perhaps being called upon to move a tortoise or suggest that project managers alter the work area slightly.

“When a tortoise is improperly moved, it may be stressed,” explained Deal. “It could suffer from exposure or become dehydrated if it loses its store of water.”

To protect the tortoise, project proponents usually choose to adjust the project without impacting the operation.

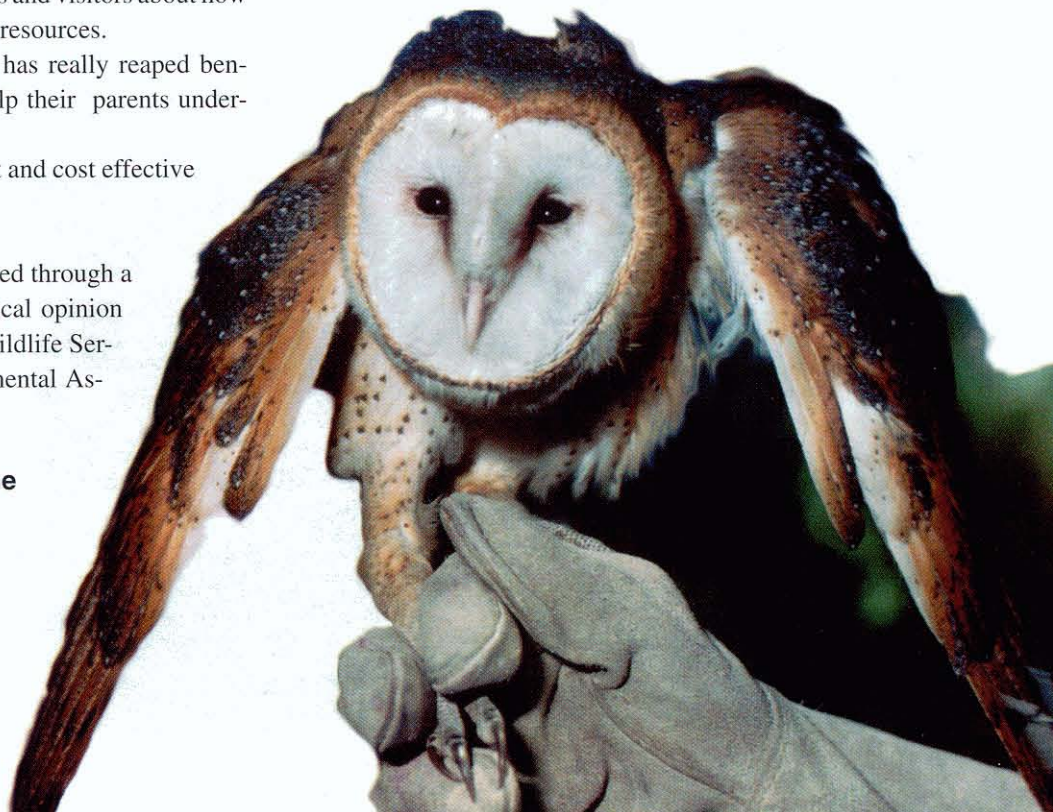
Part of the BIDDS project took place in a particularly sensitive area for the desert tortoise, as well as other wildlife and plant species. As the BIDDS project proceeded, it was discovered that alterations would have to be made to the fiber-optic route.

Each time a change was made, the project manager chose to consult a base biologist for the best way to proceed.

“The objective is to get the project done and to do it in as little time as possible, accomplishing the mission while still being mindful of the natural resources,” said Deal. •

"If the ecosystem and associated resources are managed, it will give us greater flexibility in accomplishing our mission."

Barn owls are among the many species of birds found at Edwards Air Force Base.



Through cultural resources we learn about ourselves

Whether they are people from 500 years ago or just 50, the desert inhabitants of the past can teach us something about living in the Mojave.

"The desert is, in many ways, a very good environment and people have lived here for 10,000 years," said Richard Norwood, archaeologist and Base Historic Preservation Officer (BHPO).

"In addition to the diverse Native American cultures who lived here in prehistoric times, we also have a rich aviation and rocketry history," he added. "Nearly every aspect of aerospace history in the nation is linked to Edwards Air Force Base."

That's why it's so important to protect those cultural links to the past.

It's the law

Over the years, the federal government has recognized this. Since 1906, several laws have gone onto the books, including the National Historic Sites Act, the National Historic Preservation Act, the Archaeological Resources Protection Act and the Native American Graves Protection and Repatriation Act. These laws were designed to protect and conserve sites of historic and prehistoric value which meet certain criteria.

In addition, projects subject to the EIAP process, may have cultural resources that are affected by the proposed project. If work is detrimental to a significant historic or prehistoric site, then mitigations must be applied to minimize the impact.

As BHPO, Norwood is responsible for reviewing all Edwards AFB projects and their effect on cultural resources.

*"If we see a 1909
quarter or a whole
arrowhead, we collect it."*



An
arrowhead
found at
Edwards AFB.

During the planning stages of the BIDDS project, Norwood determined that, because of the existence of two sites near south base, the route of the fiber-optic line had to be altered.

"In most cases, a project can be changed so it can continue without affecting the sites," he said. "In sensitive areas, we may do some monitoring to help the project proponent avoid them."

An extreme instance was during the installation of power lines by Southern California Edison. "In that case, we ended up excavating parts of significant prehistoric sites by hand, then dropping the poles in by helicopter," said Norwood. "We didn't want roads

going through the sites."

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Workers
excavate an
archaeological
site.

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In the works

In addition to participating in the EIAP process, Norwood, as BHPO, also supports the cultural resource protection laws by preparing scopes of work and undertaking research, as well as performing surveys and evaluations, among other duties.

Projects in the works include intensive research on the old town of Muroc, including the recording and transcribing of oral histories; and a study on Native American burial patterns in the Mojave Desert.

The cultural resources division is also responsible for the identification and documentation of previously unrecorded sites on Edwards Air Force Base.

More than 2,600 sites have been recorded and there may be as many as 10,000 on base. "Only a portion of these are significant sites, in terms of National Register criteria," said Norwood, "but some of the artifacts we've found on the surface or through excavation include stone tools and jewelry, arrow and spearheads, knives, grinding stones and even a turquoise-painted tortoise shell."

Most artifacts are left in place, because this helps the archaeologists better determine the site's purpose and history. Yet in some cases, to preserve artifacts means collecting them.

"Unfortunately, we've had our share of looters," said Norwood. "If we see a 1909 quarter or a whole arrowhead, we know that anyone who saw it would grab that right up — so we collect it."

Keeping accurate records

The cultural resources division must enter into a database all information pertaining to artifacts, photographs and documentation stored at Edwards AFB, along with the artifacts themselves, and "curate" it using federal standards. To help make the archaeologists meet these standards, a curation laboratory has been built near the future site of the Air Force Flight Test Center Museum on Rosamond Boulevard.

Currently in the database is information on thousands of artifacts and hundreds of photographs, as well as more than a hundred linear feet of documents, reports, files and field notes. •

The Geographic Information System

A map into the future

The Geographic Information System (GIS) has taken the science of mapmaking to new heights.

By using powerful computer mapping software, GIS technicians have put into electronic form the standard Air Force data sets concerning Edwards AFB, ranging from roadways to archaeological sites, from facilities and structures to the critical habitat of the desert tortoise. This information helps personnel to manage and maintain environmental and planning concerns across the base.

"It's a comprehensive system that localizes reference material and allows instant recall of accurate records," said Bob Kraszewski, GIS manager and computer analyst. "It presents the whole picture at once."

Maps of the data sets can be layered one upon the other to allow the planners, biologists and archaeologists to get a complete view of the geographical area they are concerned with.

Works in progress

As projects are proposed, new drawings can be overlaid onto these reference maps so that personnel can determine immediately what affect an action or design might have on the pre-existing environment.

In this way GIS provides an essential planning capability for the Conservation Branch of the Environmental Management office.

Before GIS, a variety of maps existed with varying scales, accuracy and detail, but most had not been kept up to date and didn't reflect reality.

In 1992, data from the photogrammetric mapping of all 470 square miles of Edwards AFB started being collected and entered into GIS. These data layers included buildings, roads, walls, fences, trees, parking lots, airfields, contours and utilities, among other details.

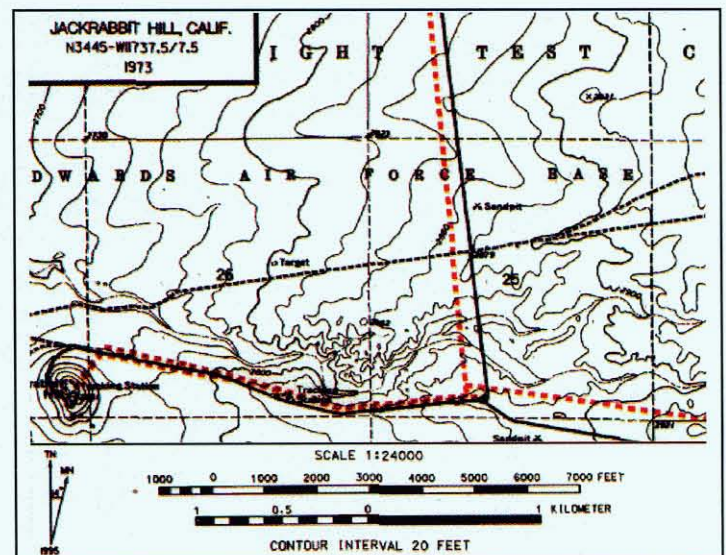
Full participation

From the beginning, it was realized that data from all organizations would have to be input into the system for GIS to be the most

effective. This included information from Plans and Programs, Civil Engineering, Environmental Management, Communications and the Test Wing.

By having all the maps in one system, planners can quickly retrieve and view the information.

Although GIS was not implemented in time to map the fiber-optic lines for the BIDDs project, it is currently being used to plan similar installations on the base. •



This GIS map shows the proposed route of a fiber-optic line at Edwards AFB.