BARRY M. GOLDWATER RANGE NON-RENEWED PARCELS STUDY

Prepared by

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT, PHOENIX FIELD OFFICE

in compliance with

THE MILITARY LANDS WITHDRAWAL ACT OF 1999
P. L. 106-65

Phoenix, Arizona

November, 2000

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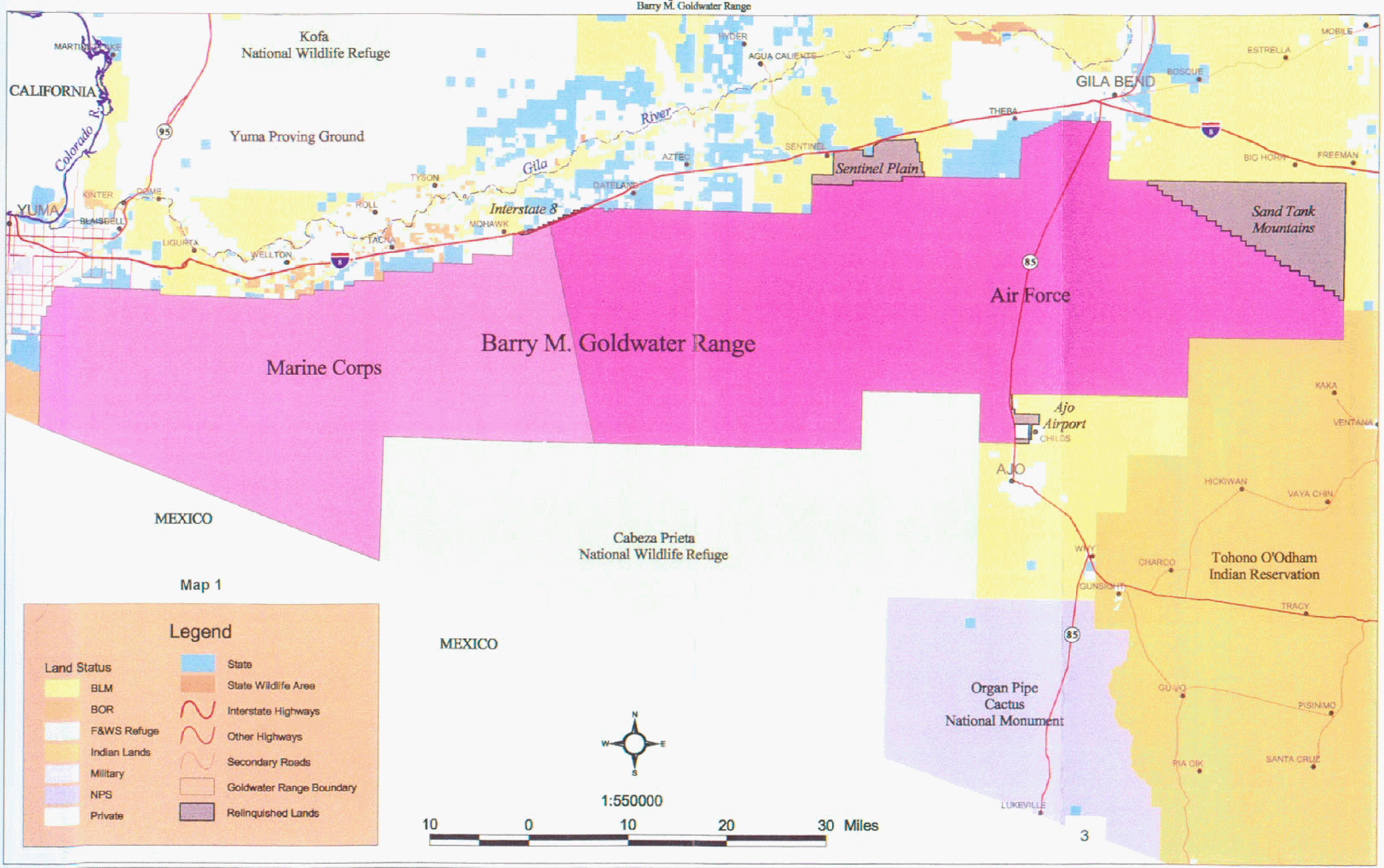
INTRODUCTION

The Barry M. Goldwater Range (formerly the Luke Air Force Range) is located in southwest Arizona. It serves the U.S. Air Force and the U.S. Marine Corps as an armament and high-hazard testing area; a training area for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and a place to develop equipment and tactics. It also serves other defense-related purposes consistent with the previously listed uses. The Goldwater Range has generally served these and similar purposes since 1941, when it was established to train U.S. Army Air Corps pilots for World War II. The land was originally set aside under a Presidential order, but was later the subject of a variety of orders and withdrawals, all of which were consolidated by the Military Lands Withdrawal Act of 1986 (P.L. 99-606), which was due to expire in 2001.

The Military Lands Withdrawal Act of 1999 (P.L. 106-65), signed on October 5, 1999, renewed the withdrawal for the Barry M. Goldwater Range for 25 years except for several land parcels or groups of land parcels. For these specific parcels P.L. 106-65 provided that the withdrawal of such lands under P.L. 99-606 "shall not terminate until after November 6, 2001, or until the relinquishment by the Secretary of the Air Force of such lands is accepted by the Secretary of the Interior." The Secretary of the Air Force stated in the Legislative Environmental Impact Statement (LEIS) (USAF 1999), prepared to address the withdrawal renewal, that these lands did not serve any military purpose and could be relinquished. P.L. 106-65 provides for that relinquishment. These lands consist of four parcels or groups of parcels and are described below and shown on Map 1. P.L. 106-65 further provided that the Secretary of the Interior was to conduct a study of these parcels. The language of P.L. 106-65 that provides for the study is as follows:

> Section 3031 (a)(7) STUDY: (A) The Secretary of the Interior, in coordination with the Secretary of Defense, shall conduct a study of the lands referred to in subparagraph (C) that have important aboriginal, cultural, environmental, or archaeological significance in order to determine the appropriate method to manage and protect such lands following relinquishment of such lands by the Secretary of the Air Force. The study shall consider whether such lands can be better managed by the Federal Government or through conveyance of such lands to another appropriate entity.
> (B) In carrying out the study required by subparagraph (A), the Secretary of the Interior shall work with the affected tribes and other Federal and State agencies having experience and knowledge of the matters covered by the study, including all applicable laws relating to the management of the resources referred to in subparagraph (A) on the lands referred to in that subparagraph.
> (C) The lands referred to in subparagraph (A) are four tracts of land currently included within the military land withdrawal for the Barry M. Goldwater Air Force Range in the State of Arizona, but that have been identified by the Air Force as unnecessary for military purposes in the Air Force's Draft Legislative Environmental Impact Statement, dated September 1998, and are depicted in figure 2-1 at page 2-7 of such statement, as amended by figure A at page 177 of volume 2 of the Air Force's Final Legislative Environmental Impact Statement, dated March 1999, as the following:
> (i) Area 1 (the Sand Tank Mountains) containing approximately 83,554 acres.
> (ii) Area 9 (the Sentinel Plain) containing approximately 24,756 acres.
> (iii) Area 13 (lands surrounding the Ajo Airport) containing approximately 2,779 acres.
> (iv) Interstate 8 Vicinity Non-renewal Area containing approximately 1,090 acres.
> (D) Not later than one year after the date of the enactment of this Act, the Secretary of the Interior shall submit to Congress a report containing the results of the study required by subparagraph (A).

Relinquished Lands
Barry M. Goldwater Range



Map 1

Legend

Land Status
- BLM
- BOR
- F&WS Refuge
- Indian Lands
- Military
- NPS
- Private

- State
- State Wildlife Area
- Interstate Highways
- Other Highways
- Secondary Roads
- Goldwater Range Boundary
- Relinquished Lands

N W E S

1:550000

10 0 10 20 30 Miles

The process of preparing to relinquish the lands is underway. The Air Force is conducting an environmental baseline analysis to determine if any sites on the parcels are contaminated with hazardous materials or munitions and to plan for the clean up of any such materials found. After the Air Force completes this analysis, the Bureau of Land Management (BLM) will begin the rest of the relinquishment process. P.L. 106-65 did not establish a deadline for this process, but BLM and the Air Force are moving expeditiously to complete the process as soon as practicable. The process of relinquishment is a two part process: (1) the Secretary of the Air Force will relinquish the parcels by notifying the Secretary of the Interior, and (2) the Secretary of the Interior must accept jurisdiction over them. This document refers to this two-part process simply as "relinquishment." Upon relinquishment, the parcels will be managed by BLM unless Congress or the Secretary directs otherwise.

BLM made an extensive effort to acquire information and ideas for this study. In addition to meeting with the agencies and tribal groups as prescribed by P.L. 106-65, BLM held five public open houses and received extensive mail and e-mail communication from the public. These public involvement efforts are detailed in a later section of this report entitled "Agency, Tribal, and Public Involvement." Although the public presented a wide range of ideas, the vast majority of communications favored keeping management of the lands within the Federal Government, supported continued recreational use in some form, and opposed any effort to allow livestock grazing or mining and mineral exploration. Most communications also supported wilderness studies and inventory; some communications opposed any consideration of wilderness.

DESCRIPTION OF THE STUDY SITES

The Barry M. Goldwater Range (the Range) encompasses about 1.7 million acres of withdrawn public land and Department of Defense owned land. P.L. 106-65, however, significantly reduced its area by excluding the Cabeza Prieta National Wildlife Refuge (a part of the Range under previous withdrawals) from the withdrawal and providing for the eventual relinquishment of the parcels that are the subject of this study. When these parcels (totaling 112,179 acres) are relinquished, the Range will encompass about 1.6 million acres.

Before P.L. 106-65, the Marine Corps used the west side of the Range under a letter of agreement with the Department of the Air Force. Public Law 106-65 divided the Range into two reservations, the west side for the Department of the Navy for use by the Marine Corps, and the east side for the Air Force. But the four parcels remain under the withdrawal of P.L. 99-606. One of the groups of parcels to be relinquished–the Interstate 8 Vicinity parcels–lies partially within each side but is entirely managed by the Air Force because it is withdrawn under P.L. 99-606. This law reserved the entire Range for the Air Force.

The east side of the Range serves mainly as an Air Force air-to-air and air-to-ground combat training site. The main user and range manager, the 56th Fighter Wing, is located at Luke Air Force Base, Arizona. The 56th Fighter Wing trains F-16 pilots for the Air Force and for other nations. Also using the east side are the A-10 Warthog units from Davis-Monthan Air Force Base at Tucson, Arizona, and the Army National Guard, flying helicopters out of the Western Army National Guard Aviation Training Site at Marana, Arizona. When the east side is not being used by the Arizona units, other military units use it as "tenants." Many of these units use the airspace over the west side as well. This use is training in one form or another, most of which is aerial. Compared to the Range's west side, very little on-the-ground activity occurs on the east side. On the east side are several target areas (manned ranges and high-explosive hills), the cleanup of unexploded ordnance, and range site maintenance and operation.

The west side of the Range serves mainly as a Marine Corps training site. The main user group is at the Marine Corps Air Station, Yuma, Arizona. In addition, Navy and Marine units from all over the West and from aircraft carriers in the Pacific also use the west side. Much of the activity on the west side is ground based although both Navy and Marine jet aircraft and helicopters use the airspace.

The following information is excerpted, summarized, or synthesized from the documents cited in the text, information from the public, and from knowledgeable persons. No original research was conducted for this document.

This study describes four parcels or groups of parcels individually. All are part of the Range but are not being used for military on-the-ground activity. Area 1 and Sentinel Plain are important to the Air Force because they provide access and encroachment control for adjacent ranges and air space through which aircraft must fly to use the adjacent target areas within the Range.

CULTURAL HISTORY OF THE GOLDWATER RANGE

Much if not all of the Barry M. Goldwater Range is within what archeologists refer to as the Papagueria, a cultural area consisting of southwest Arizona and northern Sonora, Mexico (USAF 1999). The Papagueria is divided into eastern and western parts. The Papagueria was the traditional territory of the Tohono O'odham, Akimel O'odham, and Hia-Ced O'odham peoples, among others. These groups still reside in the area and have strong cultural ties to the Range. Other cultural groups such as the Quechan, Cocopah, Yavapai, Apache, and the Maricopa are known to have used or traveled through portions of the Papagueria, as well, and these and other groups also have ties to the region.

Human occupation of the Papagueria began as early as 10,000 BC and has been more or less constant since then. The Paleoindian period (10,000-8,000 BC) was a comparatively mesic (moist) period that supported an array of vegetation and animals no longer present. This period undoubtedly supported a hunter-gatherer, somewhat nomadic way of life.

During the Archaic Period (8,000 BC-AD 200), the climate turned dryer, and the Sonoran Desert developed as we know it today. During most of this period people of the Papagueria were hunter-gatherers, but agriculture may have begun toward the end of the Archaic period.

The Ceramic period (AD 200-1540) saw two main cultural traditions, termed Hohokam and Patayan, in the western Papagueria, with perhaps a third, the Trincheras. There is debate on how these groups lived, but it is believed increased or decreased precipitation at various periods was the main factor influencing life. The Hohokam lived a somewhat sedentary life, depending mainly on agriculture.

During the Early Historic Period (AD 1540-1848) Europeans first made their way into the Papagueria. Father Eusebio Kino documented the presence of the O'odham peoples during his travels in the region in the 1600s. Other travelers came into contact with the native peoples of the region. Other groups known or thought to have been present within the western Papagueria at this time included the Cocopah, Quechan, Halchidoma, Cohuana, Halyikwamai, Yavapai, Kaveltcadom, and Maricopa. These groups settled mostly along the Gila and Colorado rivers and north. Some groups (e.g., the Yavapai and Apache) are thought to have been only occasional visitors.

Europeans first traveled the Camino del Diablo (Devil's Highway) during the Early Historic Period. Toward the end of the period, this route was heavily used. It is reported that during the early part of this period the Hia-Ced O'odham practiced gardening along the area's streams, rivers, sloughs, and springs. But the Hia-Ced O'odham were displaced by Mestizo colonization of their riverine irrigated fields. This colonization pushed the Hia-Ced O'odham out of their oases and into the desert, where they subsisted as best they could (University of Arizona 2000).

The Late Historic Period (AD 1848-1941) saw the acquisition of much of the Papagueria by the United States, and Anglo-American settlement within the region. Ranching, railroading, mining, and other activities proliferated. At the end of the period, the Barry M. Goldwater Range was established. The military has been using the Range more or less continuously since then, with most other uses, including until recently that by Native American groups, generally excluded.

AREA 1 (THE SAND TANK MOUNTAINS) (Map 2; Appendix 2, Figures 1-6)

While the LEIS mentioned above and the withdrawal renewal legislation both refer to this parcel as Area 1, it is far more commonly known and referred to as Area A and includes a major portion of the Sand Tank Mountains. Area 1 occupies 83,554 acres and is by far the most significant of the four parcels because of its long history and biological and topographic diversity.

Cultural Resources

Cultural resource work on the Goldwater Range is an ongoing process that will take many years to complete. Much work has been done, but much more remains. Most of the work has been done in areas where there is either ongoing or proposed development. The most indepth study of the prehistory and history of Area 1 was conducted in the early 1990s for the Western Army National Guard Aviation Training Site (WAATS) proposal, in which much of Area 1 was considered for use as a gunnery target and bivouac area for U.S. Army National Guard helicopter training. Although another alternative that does not affect Area 1 was eventually implemented, the Area 1 proposal was the proposed action when the project began, requiring extensive studies of the area's cultural resources.

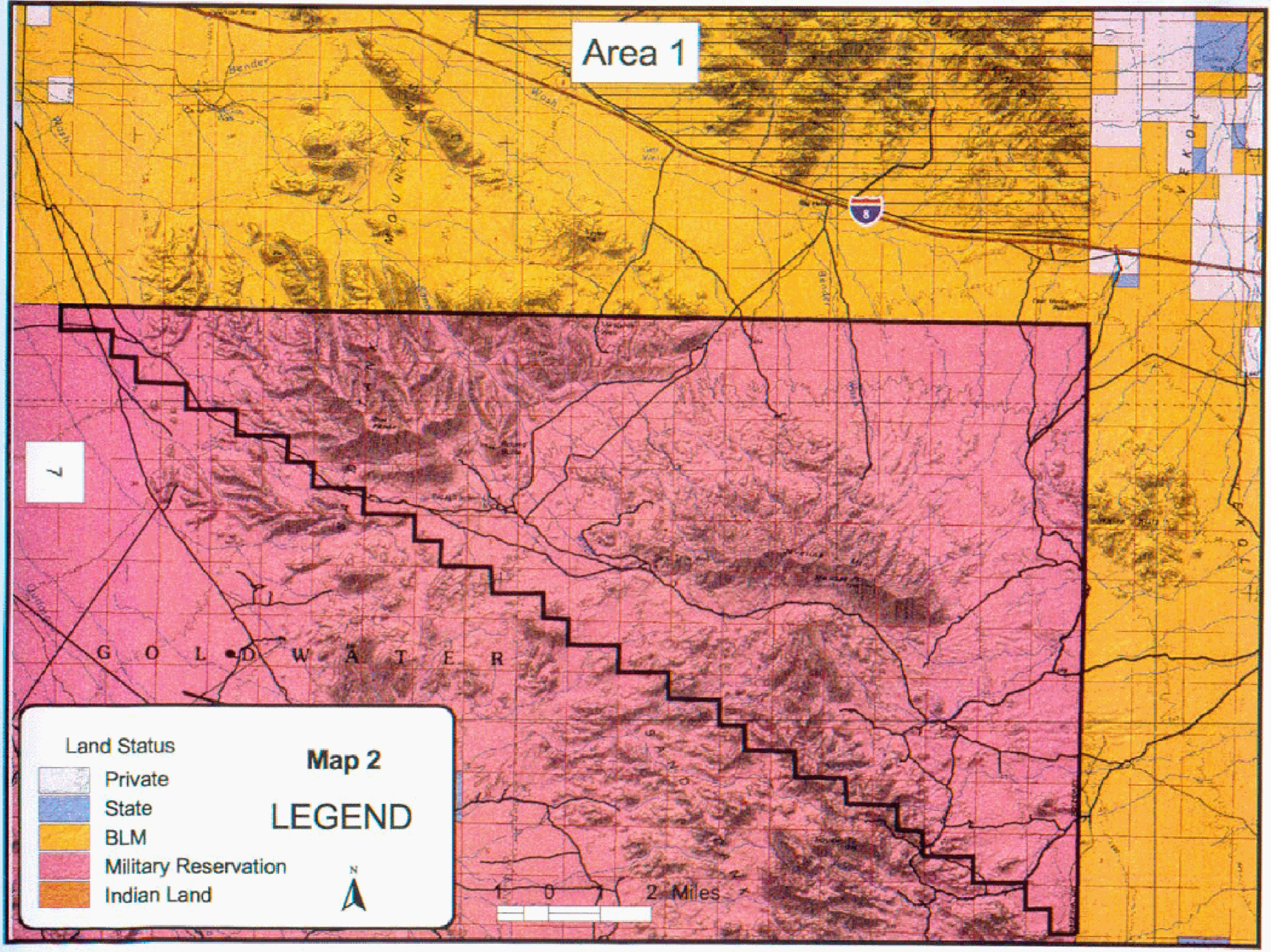
The National Guard's contractors carried out an indepth literature search and complete records check, searching for all records of previous surveys and analyses. This search covered not just Area 1, but also the larger area potentially affected by the WAATS proposal. In addition, the contractors surveyed 15,200 acres of Area 1 for cultural resources and revisited the sites of the few earlier cultural surveys in Area 1 (Homburg et al. 1993).

A total of 93 prehistoric sites were found on the 15,200 acres documented in Area 1 for the WAATS proposal, including six habitation sites, three rock shelters, one hunting blind, one rock art site, six lithic quarries, and 76 artifact scatters. These 93 sites are by no means the total of sites in Area 1. Other sites are known to exist outside the WAATS study areas. The number and types of sites that may exist in Area 1 are unknown, but the total is surely in the hundreds. The documented sites are likely representative of the sites within Area 1 in age and thus in the tribal groups using or creating them. These sites span most of the spectrum since human habitation began in the Papagueria. Many of these prehistoric sites were judged potentially eligible for inclusion on the National Register of Historic Places (Homburg et al. 1993).

The WAATS survey documented 15 historic sites consisting of three mining sites, four prospectors camps, five ranching sites, and three trash dumps. Two of the historic ranching sites–Javelina Well and Mesquite Well–are also significant prehistoric occupation sites. Perhaps the most significant of the historic sites are Papago Indian Chief Mine and Johnson Well.

The Papago Indian Chief Mine dates from the early 20th century, as does Johnson Well. The mine is unique in that a copper smelter remains on the site. This mortar, brick, and rock structure with a metal chimney is a prominent landmark in Area 1.

Johnson Well was originally settled around 1912-1920 by the Clemens family, which sold the operation to the Bender family around 1920. The Benders lived there until 1952, managing a livestock operation and other activities throughout the area. The family built many of the range improvements such as livestock water tanks in the area. Members of the Bender family, including two who grew up at Johnson Well and other places within Area 1, continue to visit this site and the area of their childhood, celebrating the


Area 1
G O L D W A T E R
Land Status
Private
State
BLM
Military Reservation
Indian Land
Map 2
LEGEND
N
1 0 1 2 Miles

Thanksgiving holiday there. They are providing oral history and other information on the ranch and life in the desert during those times.

None of the buildings survive, but the well, water storage tank, and many building foundations and other features remain. Many of the range improvements built throughout Area 1 can still be found. Some are still functional. Many of these historic sites were judged potentially eligible for inclusion on the National Register of Historic Places (Homburg et al. 1993).

The preceding is a very brief recitation of the information known about both prehistoric and historic sites within Area 1. A complete list of the sites and detailed descriptions documented in the WAATS study is contained in Homburg et al. (1993).

In addition to the literature and records searches and the on-the-ground surveys as part of the WAATS program, extensive consultations were carried out with Native American groups concerned about the area. One of the purposes of these consultations was to determine if Area 1 had any traditional cultural properties (TCP) or sacred sites. TCPs are places of special heritage value to contemporary communities (often but not necessarily Native American groups) because of their association with the cultural practices or beliefs that are rooted in the histories of those communities and are important in maintaining the cultural identity of the communities. TCPs include sacred sites but may also include other traditional use areas. Sacred sites are discrete locations identified as sacred for their religious significance or ceremonial use by Indian religious practitioners. Damage to or infringement upon these sites is perceived to be offensive to, and even destructive of, the group that values them. TCPs and sacred sites must be considered in any endeavor that could affect access to or the use of the land containing them.

The WAATS study found no TCPs or sacred sites in Area 1 (Homburg et al. 1993), but several TCPs have been identified since the study was conducted (Rankin 2000a).

The process of identifying TCPs and sacred sites is open ended. There is no single repository of knowledge and no comprehensive method of ensuring that all knowledgeable persons helped identify such sites. The U.S. Air Force has contracted out an ongoing study of the entire Goldwater Range to inventory TCPs and sacred sites and to allow Native American groups to provide ethnohistoric information from their own perspective.

Twenty-six groups were invited to participate, including all 21 federally recognized tribes in Arizona, plus groups in New Mexico and California. Some of these groups have said they are not interested, but most have said that either they have affinity or may have affinity with past inhabitants or users of the Range. Some groups are still evaluating the potential for affinity. Thus, more TCP and sacred sites may be identified within Area 1. Access to Area 1 is important to all of the groups involved in the study to help them in the identification process, and they need continuing access to sites that are identified.

Vegetation

A significant aspect of Area 1 is its vegetation, which differs from most of the Sonoran Desert. Over much of the area saguaro cacti are exceptionally dense (Marshall et al. 2000), more so than in most other areas of the Sonoran Desert. There are no data on density of the saguaro cacti in Area 1, but in places the density boggles the mind. The term cactus forest truly applies in these areas. Saguaro stands in Area 1 easily rival the finest cactus stands in Saguaro National Park. These saguaros and indeed the high quality of the vegetation community in Area 1 as a whole, as described below, are important to a wide range of wildlife species.

The Sonoran Desert evolved only in the past 10,000 years or so. Before that time, the Sand Tank Mountains area supported a plant community typical of more mesic (moist) sites. Analysis of a packrat midden in these mountains found that the plant community of 20,000 years ago was a juniper-oak-pinyon

pine woodland (Spaulding 1996). As the climate dried out, the vegetation shifted in reaction to the change. The mesophytes (water-loving plants) disappeared or were relegated to the few sites still suitable for their survival. Xerophytes (drought-tolerant plants) took over. Area 1 developed a plant community more typical of the present-day Sonoran Desert.

Because of the combination of its location, climate, geology, soils, topography, and hydrology, the Sonoran Desert has developed the most complex and diverse vegetation community of any North American desert. In reality, the Sonoran Desert is a series of plant communities, each located predictably by the specific combination of the above-listed factors present on each site. Lower elevation areas typically have the least diverse plant communities. Higher elevation areas have more diverse communities, whose makeup depends again on a combination of factors.

This range of diversity is no less true within Area 1, whose elevation extends from 1,030 feet at the extreme western end to 4,084 feet at Maricopa Peak on Javelina Mountain. With the increase of topographic variability, which reflects the combinations of the above-listed critical factors, the diversity of the plant community also increases. The lower, flatter areas are in the Lower Colorado Valley Subdivision of the Sonoran Desert. This subdivision generally consists of a relatively simple plant community dominated by creosote bush, bursage, and a few other shrubs. The higher elevation, rougher terrain areas are in the far more diverse Arizona Upland Subdivision, dominated by foothill palo verde and saguaro cactus, and secondarily by ironwood and with a wide range of woody and herbaceous plants intermingled.

In Area 1, the Lower Colorado Valley Subdivision is limited to a few thousand acres on the western end and is dominated by the creosote/bursage community. The overwhelming majority of Area 1 is in the Arizona Upland Subdivision. While the specific plant association varies by site, the two dominant associations are the triangle-leaf bursage/foothill palo verde and the triangle-leaf bursage/saguaro/mixed scrub associations (USAF 1999). The entire Arizona Upland Subdivision complex is generally referred to as the palo verde/mixed cacti association. The specific combination of factors on any site determines the specific combination of dominant plant species. But common to all sites are palo verde and saguaro cactus. The palo verde/mixed cacti association in Area 1 is one of the most structurally complex examples of this association in the Sonoran Desert. Among its outstanding features are the high density of leguminious trees and cacti (Marshall et al. 2000).

Also present within or near Area 1 are plant species that are either at the northern end of their ranges – are relicts of the more mesic times of the distant past – or are simply found here in disjunct populations (populations separated from their more normal range). This phenomenon occurs most often in higher elevation areas, such as Javelina Mountain. Such areas have an unusual combination of plant species, one that is rarely found in the Sonoran Desert – a Sonoran Mountaintop woodland community (Marshall et al. 2000). The only similar plant community in the Sonoran Desert is found on the tops of the Ajo Mountains, far to the south.

Found in these communities on and near Area 1 are unusual (for the site) plants such as Kofa barberry, elephant tree, Arizona rosewood, and juniper, as well as plants one would expect in a typical higher elevation Sonoran Desert site. Organ pipe cactus is found outside its normal range here, occurring on Javelina Mountain (Marshall et al. 2000; SWNRMC 2000) although at least one other plant is known to occur north of Area 1, just north of Interstate 8 (Anderson 2000).

Scattered through the Sand Tank Mountains, at higher elevations and on north-facing slopes, are remnant small areas of desert grassland, a rare community in the Sonoran Desert. A variety of grass species grow in these areas, including three-awns, grammas, muhlenbergias, and at least 16 other grasses (SWNRMC 2000; USAF 2000). These sites often have some of the above-addressed shrubs intermingled.

Even the low desert areas have unusual plants. Among those known to occur on Area 1 are Coville barrel

cactus and California snakebush, both on the northern edge of Area 1, (Geraghty and Miller, Inc. and SWCA, Inc. 1997). Others known from the general vicinity and thus possibly in Area 1 are Mexican jumping bean, smoke tree, bitter condalia, and naked seed. While these plant species are not rare or endangered, it is of scientific interest that they occur in or near Area 1, well outside their normal range, or in habitats with which they are not normally associated.

Several factors are likely to contribute to the uniqueness of the plant communities of Area 1. The great diversity of microclimate, geology and soils, topography, and hydrology produce a wide variety and great number of niches that are each filled by plants adapted to them. That Area 1 has been protected by its military status–its withdrawal as part of a bombing range–since the early 1940s has meant that most of the uses to which other public lands are subjected have been prohibited for many years. Among these prohibited uses are mining, livestock grazing, granting of rights-of-way, and unrestricted public recreation. The entire area was withdrawn from mineral entry with the first withdrawals. Livestock grazing was excluded over time, and the area has been essentially ungrazed since the early 1950s, except for occasional trespass livestock along the edges. In addition, the military has made essentially no use of the lands within Area 1 for any purpose other than as a safety buffer to keep the public away from the live fire ranges to the south. This has resulted in a de facto conservation area.

The absence or close management of the above-listed and other uses for 60 years has kept the plant community in relatively pristine condition. This is an unusual situation in the Sonoran Desert, which has been subjected to much development and use beginning several hundred years ago, when the Spanish came into the country and began to colonize it. This development and use continues and is occurring at the fastest rate ever today. Arizona is one of the fastest growing states in the Nation, and Maricopa County, in which Area 1 lies, is the fastest growing county in the country. Relatively undisturbed large tracts of the Sonoran Desert are rare.

Water and Riparian Areas

Area 1 is drained by four major dry wash systems, all tributary to the Gila River:

- Quilotosa Wash, draining the south central portion.
- Sand Tank Wash, draining the central and western portion.
- Bender Wash, draining the north central portion.
- Vekol Wash, draining the eastern third of the area.

All of these systems have many tributaries, large and small. All are bone dry except after heavy or prolonged rains, rare events in the desert.

A few natural water sources are present, as are a few artificial sources. Natural sources consist of tinajas in mountain canyons–potholes that catch and hold runoff from the occasional rain. There are two springs, one above Javelina Well and another–Bender Spring–along the southern border. Bender Spring is on the boundary of Area 1. While these two sites are considered by many technical experts to be springs (Homburg et al. 1993), there are some authors that do not classify them as such (University of Arizona 1986). Whatever the case, these are not dependable water sources because in periods of prolonged drought, they, like the tinajas, are likely to dry up.

Area 1 also has at least 17 wells that were dug many years ago to provide livestock water (ARCADIS Geraghty & Miller 1998a). Not all are still functional. While those that are functional may be more dependable, the water is often too deep to be reached. Area 1 also has at least seven wildlife catchments, which consist of concrete or fiberglass tanks and sheet metal aprons designed to catch and hold rainfall for wildlife.

Another natural water source, which may be responsible for the name of the Sand Tank Mountains and Sand Tank Wash (Barnes 1988), consists of the sand tanks that form in washes. These are natural

depressions, similar to tinajas, in wash bottoms. They fill with sand and other rocky debris but also catch and hold water in times of runoff. Water is present, but must be exposed by digging. Because these water sources are protected from the sun and wind, evaporation is lower, and water is more likely to be found. The problem is finding the buried sand tank in the wash bottom.

Simply put, those wishing to drink water while in Area 1 had better bring water with them. Area 1 does not have accessible potable water.

The absence of water means there are no riparian areas as we generally think of them, no verdant strips of cottonwoods and willows along clear-flowing streams, and no lush grassy meadows. There are, however, what wildlife biologists in the Southwest call xero-riparian areas. These areas occur along the dry washes, both those named above and their larger tributaries. These dry wash riparian sites stand out from the surrounding vegetation and are visible for miles. They support a much denser vegetation community than the surrounding desert, whether the Lower Colorado Subdivision or Arizona Upland Subdivision. Generally, the larger washes are lined with mesquite, ironwood, paloverde, and a variety of other trees and shrubs such as desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants. Smaller washes have the occasional large tree or simply have slightly larger trees of the same species as the surrounding plant community.

Xero-riparian areas are critical in the support of a variety of wildlife species. They provide the dense cover many birds need for successful nesting, foraging, and escape, and birds heavily use them during migration. These areas provide forage and cover for large and small mammals. Many reptile species frequent these areas because of the insect abundance and diversity. Without these plant communities, Area 1 would not be quite the special place it is.

Wildlife Management

The Arizona Game and Fish Department (AGFD) has jurisdiction over and the lead in managing wildlife in Arizona (Arizona Revised Statutes 17-102). AGFD works with the Air Force, BLM, and nongovernmental organizations such as the Arizona Desert Bighorn Sheep Society in managing wildlife on the Goldwater Range and with these and other partners throughout Arizona. Area 1 is part of AGFD's Hunt Unit 40A. AGFD manages wildlife populations and their use through its regulatory process, by issuing hunting licenses and permits for big and small game, by monitoring populations (big game surveys) and by cooperating with the land managing agencies in habitat management actions such as water developments. AGFD and its partners have built at least seven water catchments within Area 1, all benefitting both game and non-game species. AGFD and the U.S. Fish and Wildlife Service work together in managing federally listed wildlife species.

Wildlife

The same factors that account for the diversity and richness of vegetation communities in Area 1 also apply to the wildlife. In fact, the diverse plant community is responsible for the diverse wildlife community. No studies specific to Area 1 have been conducted to determine wildlife species diversity or richness, but work has been done on the Goldwater Range as a whole, allowing the inference of species occurrence and richness to Area 1. The Range has at least 62 mammal species, more than 200 bird species, 44 reptile species, and 5 amphibian species overlap or occur in the Goldwater Range proper (University of Arizona 1986). A great many of these species occur within Area 1. More complete species lists of wildlife on the Goldwater Range can be found in University of Arizona (1986) and USAF (1999).

Birds

More than 200 species of birds, including many neotropical migrants as well as resident species, occur or are likely to occur on the Goldwater Range. Fifty-nine bird species are known to nest there (University of Arizona 1986). One can infer that most of these species also occur in Area 1. The structural diversity and species diversity of the Arizona Upland Subdivision's palo verde/mixed cacti plant association in Area 1 provide habitat for many bird species. The saguaros and larger trees provide nesting sites for cavity builders/nesters like woodpeckers and for species that use these cavities, and nest sites and perches for raptors such as the Harris hawk and red-tailed hawk. An abundance of smaller birds find habitat in the shrub and herbaceous layers. Many migrant birds rely on this habitat for feeding and resting during their north-south annual migrations. The Lower Colorado Subdivision's creosote/bursage community is also important to species requiring more open habitat, such as Le Conte's thrasher, black-throated sparrows, and lesser nighthawks. This habitat is also important to migrant species, some of which overwinter in this habitat.

Over the last few years intensive surveys of migrating birds have been conducted in the Sauceda Mountains, just southwest of the Sand Tank Mountains and Area 1, (Dames and Moore 1994; Morrison et al. 1997; Bibles and Harris 1999). These point count surveys detected 107 species of neotropical migratory birds either moving through the Range or nesting there. Most migrating birds species were detected in the xero-riparian plant community (77% in 1994, 96.8% in 1997). This habitat type, which makes up only 1% to 10% of the total habitat, is by far the most important habitat for birds on the Goldwater Range, and by extension, in Area 1, for migrating birds.

Intensive surveys have been conducted to document the occurrence of small owls (elf owl, western screech owl, cactus ferruginous pygmy owl) on the eastern Goldwater Range (Morrison et al. 1996; Dames and Moore 1998; 1999). The elf owl, which is migratory, and the western screech owl were determined to be present and nesting in Area 1. In addition, barn owls and great horned owls were also confirmed to be present. No cactus ferruginous pygmy owls, an endangered species, were detected but there have been unconfirmed sightings in Area 1 and elsewhere on the Goldwater Range (Marshall et al. 2000; SWNRMC 2000). The palo verde/mixed cacti and xero-riparian habitats in Area 1 may have potential as transplant sites for the cactus ferruginous pygmy-owl (SWNRMC 2000). All three of the small owls surveyed for are obligate cavity nesters, using cavities made by other bird species, most often in saguaro cacti.

Mammals

The eastern Goldwater Range has been surveyed intensively for the presence of bat roosts and for bats themselves (Dalton and Dalton 1994; Dalton et al. 1994; Dalton and Dalton 1999). Part of the driving force behind these surveys was to the need to determine if the federally listed endangered lesser long-nosed bat uses the Range. But just as importantly, the surveys were needed to determine if the Goldwater Range provides habitat for bats and, if so, how extensive that use is by all species.

Lesser long-nosed bats migrate into the Goldwater Range area in the spring and summer and in the winter return to more southern areas in Mexico. They move north in the spring, following the bloom of forage plants such as saguaro and organ pipe cactus. Maternal roosts are the key shelter component for this species in the United States. Pregnant females gather in large numbers in communal roosts where they bear and raise their young. They forage over large areas, flying many miles each night between these roosts and food sources. Main foods are the flowers and fruits of columnar cacti, of which the saguaro is the main species over most of the Sonoran Desert. Maternal roosts exist south of Area 1 and east of Area 1, both within the foraging range of the species, which may be up to 50 miles. Dalton et al. (1994) found that bats from both roosts apparently travel to Area 1 to forage. The dense stands of saguaro in Area 1 are likely important food sources for the bats from both maternity roosts.

Intensive surveys have sought to locate bat roosts in the eastern Goldwater Range. The surveys found many caves, mines, adits, and assorted "nooks and crannies." But not all had bats or bat guano present, revealing that not all are suitable bat habitat. This finding was expected because bats have highly specific requirements for suitable roosts. Species of note that were present in significant numbers are the California

leaf-nosed bat and cave myotis, both of which are insectivorous. The California leaf-nosed bat does not hibernate but remains active through the winter.

Vekol Valley, just east of Area 1, is a potential transplant site for the federally listed endangered Sonoran pronghorn, which is found on the Goldwater Range, but to the southwest of Area 1 (Hervert 2000). Area 1 would become part of the habitat for a transplanted Sonoran pronghorn population, since its eastern side is part of Vekol Valley and would likely provide habitat. While the terrain over much of Area 1 is too rugged and mountainous to serve as pronghorn habitat, the flatter areas and the bajadas (lower mountain slopes) could provide habitat for the pronghorn for part of the year. Thus, Area 1 could be important in the recovery of this endangered species. Any proposal to transplant this species is likely years away because of the low numbers of animals in its present range. In the meantime, it would be important to manage Area 1 so that it retains the vegetation diversity and condition and freedom of access (lack of fences) needed by the pronghorn.

Desert bighorn sheep use all of Area 1, except possibly the creosote/bursage community on the west end and the bajadas on the north edge. The sheep population varies over time, growing in wet periods and shrinking during droughts. The sheep are not confined to Area 1 but are part of a larger population that uses mountain ranges and the land between them over a much larger area. But the habitat within Area 1 can support bighorns on a year round basis, especially with the addition of water provided by the seven catchments spread over the area.

Both white-tailed deer and mule deer inhabit Area 1, but they occupy different habitats. White-tailed deer are typically found at higher elevations than are mule deer. The white-tail is the diminutive Coues white-tail. This species is found mainly in oak-mesquite woodlands in more eastern and southern locations. Its presence in the Sonoran Desert is unusual. The white-tail reaches something of a range limit in Area 1, being found nowhere north or west of this area in the Sonoran Desert.

The region's mule deer are desert adapted, having modified their activity to take advantage of the cooler night temperatures. They depend on perennial water sources. The presence of the wildlife water catchments in Area 1 helps assure their continued presence.

Collared peccary (javelina), a small pig-like animal, are found throughout Area 1 and the surrounding desert. They have comparatively broad habitat and forage requirements that can be met by most places within the more mesic areas of the Sonoran Desert, as well as in other habitats. They appear to be limited by cold, seldom if ever a factor near Area 1.

In addition to these larger mammals, a wide variety of smaller, less obvious mammalian species inhabit Area 1. These species include a variety of bats in addition to those addressed previously, cottontail rabbits, jackrabbits, small rodents, and predators, including mountain lion, coyote, bobcat, and gray fox.

Reptiles

The Goldwater Range supports 44 reptile species, most of which are likely to inhabit Area 1. These include 23 species of snakes, 20 lizard species, and one tortoise species. Reptile species of interest include five rattlesnakes (western diamondback, Mohave, sidewinder, black-tailed, and tiger. The speckled rattlesnake may also be present because it occurs in adjacent areas. Other reptilian species include the Mexican rosy boa (SWNRMC 2000), the Gila monster (the only poisonous lizard in the U.S.), the western chuckwalla, the redback whiptail, and the desert tortoise.

Desert tortoises are locally common on lower mountain slopes with adequate shelter sites. Tortoises, like all reptiles, must have places to escape the heat of the sun and to spend the winter. In the Sonoran Desert, these places are typically areas with many boulders, usually somewhat jumbled together to provide abundant small openings. In the absence of natural openings, tortoises can dig under the boulders. The lower mountain slopes of Area 1 provide this habitat in abundance.

Amphibians

An environment as harsh as the Sonoran Desert and as dry as Area 1 would be likely to lack water-dependent amphibians, but several species of toads inhabit the Goldwater Range. Most are probably also present on Area 1. Known to be present is the Sonoran Desert toad–the largest western toad. Other toads likely to be present because they are known to occur in adjacent areas include Couch's spadefoot toad, Sonoran green toad, red-spotted toad, and several others.

Species of Special Concern

Addressed here are plant and wildlife species that are listed as threatened or endangered or that are candidates for listing under the Endangered Species Act of 1973 or are listed as "wildlife species of concern" by the Arizona Game and Fish Department. These species are listed in the following table.

SPECIES OF CONCERN WITHIN AREA 1, BARRY M. GOLDWATER RANGE

Common Name	Federal Status	State Species of Concern	Known Presence	Comments or Habitat in Area 1
Lesser long-nosed bat	End.	WSC*	Yes	Forages on saguaros, migrant.
California leaf-nosed bat	---	WSC	Yes	Caves/mines, year round resident.
Sonoran pronghorn	End.	WSC	No	Possible transplant.
Peregrine falcon	---	WSC	Yes	Migrates through.
Cactus ferruginous pygmy-owl	End.	WSC	No	Possible sightings. Potential to be present.
Desert tortoise	---	WSC	Yes	Mountain areas.
Acuna cactus	Cand.	HS**	No	Found south of area.

* Wildlife Species of Concern

** HS=Highly safeguarded by the Arizona Department of Agriculture

Most of these species are addressed in the preceding text. All are of considerable importance in managing activities and habitat on the Goldwater Range and in Area 1 when they occur there or potentially do so. Federal agencies must consult with the U.S. Fish and Wildlife Service on their activities that may affect federally listed species.

Recreation

The military nature of the main use of the land in the Goldwater Range and Area 1 has kept overall recreational use low compared to public lands outside the Range. Much of the Goldwater Range, areas such as the tactical ranges and manned gunnery ranges, are essentially closed to recreation. But Area 1 and some other parts of the Range are open to the public for recreation if (1) that use does not interfere with the Range's military mission and (2) users are willing to abide by certain rules that do not apply to other public land areas. Primary among these rules is that a permit is required to enter and use Area 1. This permit, issued by Air Force, Marine Corps, BLM, and Cabeza Prieta National Wildlife Refuge offices near

the Range, is free with a completed application, is valid from July 1 through June 30, and allows the visitor to enter Area 1 and other parts of the Range that are open to public access.

People want to visit Area 1 for many reasons. It has spectacular scenery, historic and prehistoric sites, a diverse flora and fauna, unique geological features, and a sense of wildness (USAF 1999). Opportunities for recreation include hunting, backpacking, hiking, camping, picnicking, photography, auto touring, nature study, four-wheel drive use (on existing roads only), visiting cultural sites, rock hounding, and sightseeing. Probably all of these activities occur to some degree, but data on visitor use are limited.

The Arizona Game and Fish Department estimated that in the mid-1990s, 495 hunter days were spent each year in and near Area 1. Some 300 of these hunter days involved small game hunting. The balance involved hunting for deer, javelina, and desert bighorn sheep. The number of hunting days varies by year, depending on the abundance of small game and the number of permits issued for big game. The Air Force does have data showing that, in 1996, of 453 recreation-related entries to the entire Range, 83% were for hunting (USAF 1999).

Currently, recreational use of Area 1 occurs under the prescription set forth in the BLM's Lower Gila South Resource Management Plan/EIS-Goldwater Amendment (BLM 1990). This plan provides for recreation management, including signing, law enforcement, visitor services, public safety, and resource protection. Off-highway vehicles and all other vehicles in Area 1 are limited to established roads.

By and large, recreational use of Area 1 has had little lasting effect on resources or land. There is little trash or other signs of abuse over most of the area. Perhaps the most visible sign of noncompliance with the rules is the use of some dry washes (which are xero-riparian habitat) by off-highway vehicles. BLM's land use plan prohibits such use, but some users choose to ignore this closure. Dry washes are important habitat to a variety of wildlife, and their closure to vehicular use helps protect that habitat.

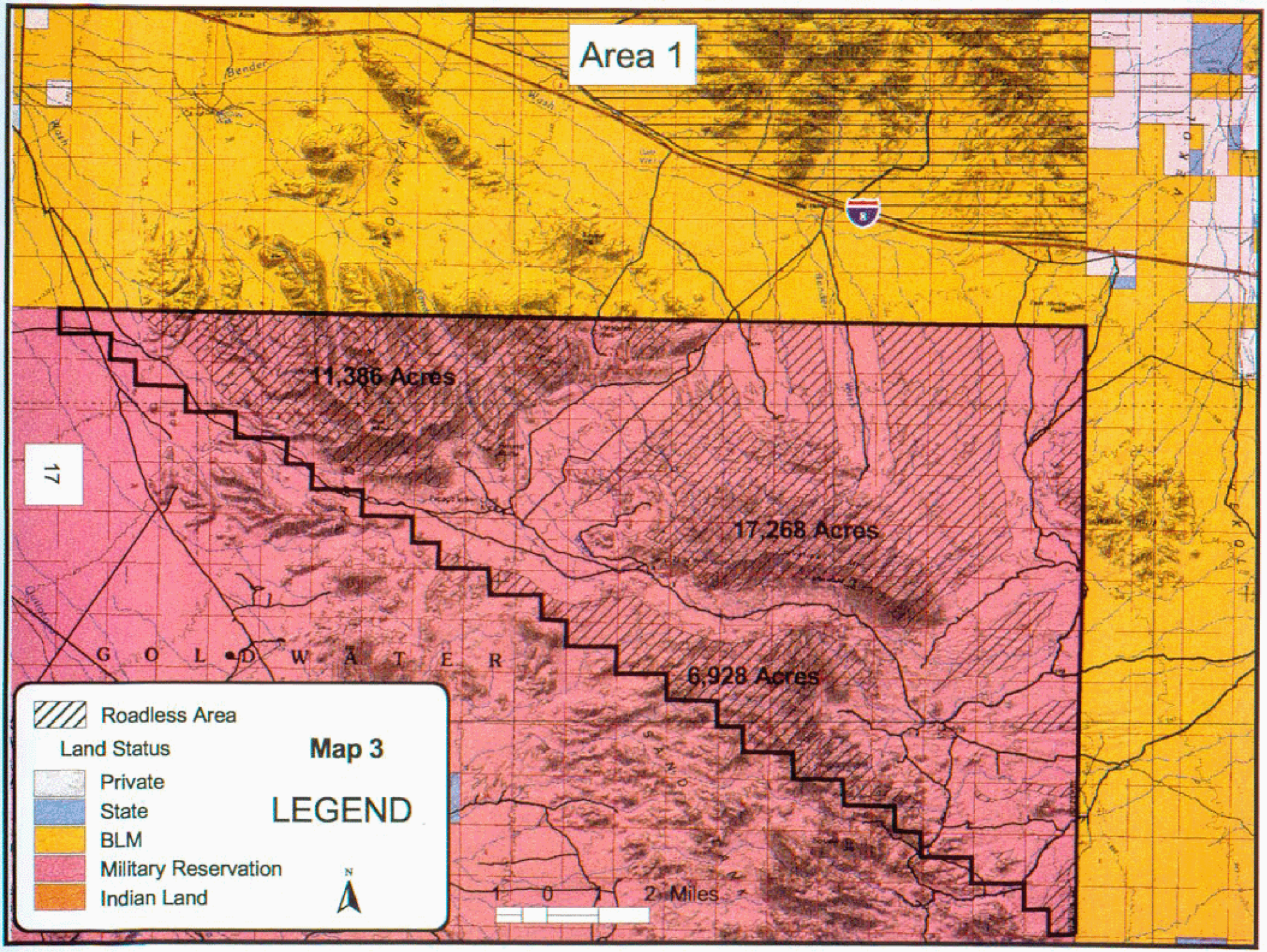
In an inventory of scenic quality on the Goldwater Range, Area 1 was placed in the Class A Landscape designation (Lands of Outstanding or Distinctive Diversity and/or Interests), the highest class under that system (USAF 1999).

Wilderness

Section 201 of the Federal Land Policy and Management Act of 1976 (FLPMA) requires that the public land resources be inventoried. Included in those resources is wilderness. The lands within Area 1 were not inventoried for wilderness character under Section 603 of FLPMA when the BLM inventoried public lands in the 1970s and 1980s because their military mission was determined to be incompatible with wilderness study and management. Now that the Air Force will be relinquishing these lands, such an inventory could occur.

As part of its ongoing management of the Range, BLM has inventoried Area 1 to locate and map all existing vehicle routes. Using that information and the Recreation Opportunity Spectrum (ROS) computer program, BLM conducted an analysis to determine if any areas within Area 1 met the basic Wilderness Act criteria of being roadless and consisting of at least 5,000 acres. The ROS program assigns public lands to one of several categories. Important to Area 1 are the "primitive roaded" category and the "roadless" category. All lands within a mile of a primitive road (and all roads on Area 1 are primitive) are assigned to the "primitive roaded" recreation class. All lands more than a mile from a road are assigned to the "roadless" recreation class. According to these criteria, three land blocks within Area 1 exceed 5,000 acres (see Map 3).

These areas must be considered only gross indicators of the land within Area 1 that could qualify for wilderness designation. The actual amount could be more, less, or none. Only a complete wilderness inventory assessing all wilderness characteristics, as defined by Section 2(c) of the Wilderness Act of


Area 1
11,386 Acres
17,268 Acres
6,928 Acres
47
G O L D W A T E R
Roadless Area
Land Status
Map 3
Private
State
BLM
Military Reservation
Indian Land
LEGEND
N
1 0 1 2 Miles

1964, could ascertain if any of the lands truly have wilderness character. Some of the lands within a mile of any of the roads may have wilderness character, thus adding to the total. Or that same inventory might find that less or none of the land within Area 1 has wilderness character. Some factors that need to be considered can be assessed only on the ground. The 5,000-acre requirement is only a threshold that can suggest the need for a more indepth study or inventory of all wilderness characteristics.

A major contributing factor to lands within Area 1 meeting this minimum qualification for consideration as wilderness is that they have been excluded from many of the uses to which adjacent or nearby public lands have been subjected. The 50-60 year absence of mining and mineral exploration and livestock grazing and the level of control of recreation use have helped maintain the relatively natural condition of these lands. The absence of these uses has helped keep vehicle route development to a minimum, since Area 1 has received less pressure to get vehicles into its every "nook and cranny." Area 1 has thus avoided significant impacts.

Minerals and Mining

The Goldwater Range has been withdrawn from mineral entry since its first withdrawals in the early 1940s. On Area 1, other than on one site and perhaps some occasional casual use, no mining or mineral exploration has occurred since that time.

The many small mine and prospecting sites within Area 1 attest to the desire of early prospectors and miners to "strike it rich" and to their courage and strength, for these sites were worked when transportation was difficult and times were tough. Area 1 has about 13 known mining-related sites (Dalton and Dalton 1994, 1999), ranging from shallow prospects to shafts and adits more than 100 feet deep. Several of these sites were producing mines. The Papago Indian Chief, Altuda, Chloride, and Johnson mines are known (Homburg et al. 1993; ADMMR 2000). Others are likely.

The miners at Papago Indian Chief Mine built a smelter, which still stands, to separate the minerals (copper and perhaps gold) from the parent material on site, thus reducing haulage costs. This smelter appears to have served more than its parent mine because much effort was required to build and operate it (Homburg et al. 1993). Though not documented in the written record, oral history accounts reveal that Thomas Childs, a prominent early rancher in the area near Ajo, Arizona, once had an interest in the Papago Indian Chief Mine (Rankin 2000b).

In support of the development of the LEIS and the later withdrawal application for the Range, a mineral potential report was prepared (ARCADIS Geraghty & Miller 1998b). Assessing the potential for energy and mineral resources on the Range, this report is based on geologic, geochemical, geophysical, and remote sensing data; historic production data, and on information about mines and mineral occurrences in similar areas. The report states that there is a "good indication" of a "moderate" potential for porphyry copper and a mineral called wollastonite in the Sand Tank Mountains and the lands to the east.

The Arizona Department of Mines and Mineral Resources (ADMMR 2000) states that miners in and around Area 1 sought base metals (copper, lead, and zinc) and precious metals (gold and silver) and that there was some production before 1940. ADMMR recommends that the area (1) be examined using modern exploration techniques to determine if mineral resources are present and (2) be opened to mineral extraction under conditions to minimize public safety hazards.

Access

Area 1 is open for public recreation use under specific conditions, chief among these being obtaining an access permit. The Air Force closely controls access from the west and south and keeps such access closed to the public. Visitors can access Area 1 by roads that enter from the north or east. All access

roads are primitive two-track trails that are gated and locked. When obtaining their access permits, prospective visitors are given the combination to the gate lock. This combination is occasionally changed. Access has not been formally assessed, but road access into and within Area 1 appears adequate, and no more road building or upgrading is needed.

In addition to obtaining a permit each time they wish to enter Area 1, visitors must call a 1-800 telephone number and provide specific information about their planned trip. This phone call allows the Air Force and BLM to inform visitors of public safety factors in Area 1 at the time of their visit.

The access permit program originally emerged as a public safety and Range security tool. By requiring an entry permit, the Air Force and BLM could allow some visitation while assuring visitors were aware of the safety hazards of Area 1, including the following:

- Being next door to an active bombing range–the East Tactical Range (East TAC)–and the potential hazards that entails.
- The boundaries of Area 1.
- If any part of the Range is closed.

Because Area 1 serves as an access and encroachment control for East TAC and Manned Range 3, the Air Force stated in the LEIS that the decision to exclude Area 1 from the withdrawal depends on the condition that Area 1 would be managed to maintain these access and encroachment control functions (USAF 1999, page 2-40). The Air Force recently reiterated its position that Area 1 serves as a safety buffer for East TAC and Manned Range 3 and recommended that access to the area remain restricted.

Military Mission

The Air Force has stated that it can relinquish Area 1 because the area does not underlie restricted airspace and because the Air Force does not use the lands within Area 1 in fulfilling its mission. Nevertheless, in the LEIS (USAF 1999), the Air Force did place as a contingency on the relinquishment that the lands continue to be managed to provide an access and encroachment control function for the adjacent Range. More recently, the Air Force expressed similar concerns in a letter to BLM (USAF 2000).

The airspace above Area 1 is important to the Air Force and to the Army National Guard (whose helicopters use the airspace to reach East TAC and Manned Range 3) because that airspace facilitates the use of Manned Range 3 and East TAC, two active target areas on the east side of the Range. Although the airspace over Area 1 is not restricted, without this airspace the use of East TAC would be compromised. In addition, the Air Force uses both live and inert munitions, ranging up to 2000-pound bombs, on East TAC. The aim point for some of these munitions is within 4 miles of Area 1. In the past, some bombs have missed their mark and impacted in Area 1. This could happen again. Also, Area 1 could have buried munitions from years past.

Thus, the Air Force has used Area 1 for access and encroachment control by limiting access and use. The Air Force has said that its relinquishment of Area 1 is contingent upon access remaining restricted so that the area continues to serve that function. While P.L. 106-65 requires the relinquishment with or without that contingency being fulfilled, it remains of considerable importance to the military mission that restricted access be considered in the present process.

Although the use of the adjacent Goldwater Range can affect Area 1, conversely and just as importantly, unsuitable land uses in Area 1 would have major impacts on the military mission on the adjacent Range. Thus, the Air Force has suggested that future management of Area 1 include only uses that would be compatible with that mission. The Air Force further suggests that low-intensity recreation and resource preservation management should be compatible future uses of the land, but that livestock grazing, mining

and mineral exploration, agriculture, residential or commercial development, and high-intensity recreational use would be incompatible (USAF 2000).

Scientific Values

Area 1 has been closed to many of the uses that occur on most publicly owned land in Arizona and has largely escaped the fragmentation, development, and degradation that have afflicted much of the Sonoran Desert over the past 60 years. Area 1 is in essence a pristine landscape, a rare commodity over much of the desert Southwest.

Area 1 is a large block of essentially unaltered landscape. It already has in place controls on most of the uses that could degrade it. It has the access needed to facilitate study. And it offers a unique opportunity for scientific research into a variety of ecological, environmental, archaeological, cultural, social, and economic issues, limited only by the imagination of the researcher and the needs of society. Its location near both the Phoenix and Tucson metropolitan areas places it near both Arizona State University and the University of Arizona, as well as the county-run community college systems of both Maricopa and Pima counties. Its location west of Interstate Highway 10 and just south of Interstate Highway 8 makes it readily accessible from both Phoenix and Tucson, and from Yuma, Arizona, which also has a community college system and a branch of Northern Arizona University.

In short, Area 1 presents an opportunity for learning about our world, an opportunity that would be difficult if not impossible to duplicate elsewhere in the Sonoran Desert.

Ecoregion Conservation

The Nature Conservancy (TNC) recently released a document and proposal on the conservation of biological diversity within the Sonoran Desert Ecoregion (Marshall et al. 2000). Most of the following text either summarizes that document or comes directly from it.

The document, a compilation of existing research and the consensus of more than 100 experts in the biology of the Sonoran Desert Ecoregion, describes the Sonoran Desert as an ecoregion especially rich in biodiversity and as one of 200 ecoregions worldwide that deserve special conservation attention. This ecoregion is described as “equally diverse in its human population with more than a dozen Native American Tribes represented, a well as many recent migrants to the region. In 1990 the Ecoregion contained 6.9 million residents, nearly double the population size of 1970. In 2020 the population is expected to reach 12 million!”

The document briefly describes the effects of this growing human population on land uses and the ecoregion’s biodiversity, effects that are largely adverse to both habitat and species diversity. The Nature Conservancy states that “it is economically and strategically prudent to understand where and how to manage for conservation purposes well before species and ecosystems become ‘endangered.’ Recovering species that have declined to low numbers or ecosystems that have been degraded is far more expensive and problematic than maintaining our extant biodiversity.”

The Nature Conservancy postulates that biodiversity need not decline. Its document summarizes the methods and results of a two-year effort to select a network of areas in the Sonoran Desert Ecoregion that, if managed appropriately for conservation, would help ensure the long-term persistence of the ecoregion’s biodiversity.

The Nature Conservancy and the experts it worked with used what is termed the “coarse filter-fine filter” approach to listing “conservation targets.” The coarse filter consists of ecological groups, or assemblages of plant species, found in recurring patterns across the landscape. Because these assemblages occur at

larger scales than individual species, they are assumed to capture abiotic components that support biodiversity and ecological processes. Coarse targets could then represent most species in the Ecoregion. All terrestrial vegetation communities native to the Sonoran Desert Ecoregion were selected as coarse targets. Other factors were considered as course targets, but they play no role in Area 1 and are not addressed.

The fine filter consists of the species for which distributional and population data are better known and available in conservation-related data bases. Because to their rarity or habitat requirements, these species are not likely to be represented in the coarse filter. Among fine filter targets are both rare and common species from both the invertebrates and vertebrates of the ecoregion. A total of 432 fine filter targets were selected for the ecoregion.

The Sonoran Desert Ecoregion produced 100 landscape-scale conservation sites, based on a variety of factors. Ranging from very large areas (more than 2 million acres) to small areas (403 acres), these sites contain an average of six targets. From the original analysis, Conservation Site 32 contains 12 targets. Other analysis produced 10 more targets, giving Conservation Site 32 a total of 22 targets (Marshall 2000). This is an unusually high number of targets since the average is six.

Conservation Site 32 is large (636,196 acres), much of it federal land. It contains the Table Top, Sauceda, and Sand Tank mountains and all or parts of smaller mountain ranges and the valleys in between, particularly Vekol Valley. This site provides an opportunity to conserve a wide variety of the Sonoran Desert Ecoregion's biodiversity that remains largely intact. The ecoregion contains a variety of natural vegetation communities, including unique woodland assemblages on higher peaks, perhaps the ecoregion's best example of the palo-verde/mixed cacti association, and valley bottom grasslands. The diversity, density, and evenness of plant distribution in the palo verde/mixed cacti association in the Sand Tank and Sauceda mountains probably represent what many areas of the Arizona Upland Subdivision looked like before the introducing of livestock grazing and other impacting uses.

At 83,554 acres, Area 1 makes up 13% of Conservation Site 32. It is the best preserved portion of Site 32 because the other portions have been used for a variety of land uses for many years. Much of Site 32 lies within the Goldwater Range and has been affected somewhat by military activity. The balance of the public land is under BLM's multiple use management.

SENTINEL PLAIN (Map 4; Appendix 2, Figures 7-10)

The Sentinel Plain relinquishment parcel consists of 24,756 acres located 20 miles west of Gila Bend, Arizona, south of Interstate Highway 8 and the Union Pacific Railroad's right-of-way. References to Sentinel Plain in the following refers only to the relinquishment parcel, unless the text clearly states the specific reference is to the larger area also called Sentinel Plain, of which the relinquishment parcel is part.

Sentinel Plain greatly differs from Area 1. Twenty-five miles west of Area 1, Sentinel Plain is in a dryer microclimate and is much less diverse in topography and biology. The two areas differ in other ways as well.

The Sentinel Plain parcel that the Air Force will relinquish is part of the much larger geologic feature also known as the Sentinel Plain. This feature is a 225 square mile volcanic field consisting of basalt flows up to 100 feet thick. These flows generally follow the Gila River west of the town of Gila Bend. Active between 3.3 million and 1.3 million years ago, the volcanic field contains 12 identifiable eruption centers, which appear as northwest-southeast elongated oval cones. Sentinel Peak, east of the small community of Sentinel and just north of Interstate 8 and visible from it, is one of the volcanos or eruptive centers. The volcanic nature of the terrain is reflected in the lack of vegetation cover and the presence of desert pavement interspersed with accumulations of larger, coarse, angular stones that have undergone little erosion or degradation. Soil development is minimal (Oxford and Bender 1973).

In 1973, the State of Arizona proposed that the entire larger Sentinel Plain be designated as an natural area (Oxford and Bender 1973). The designation centered on the plain's volcanic character as the largest lava flow in southwest Arizona. The proposal was never carried out, but it shows that Sentinel Plain has some unique characteristics that have attracted attention for some time.

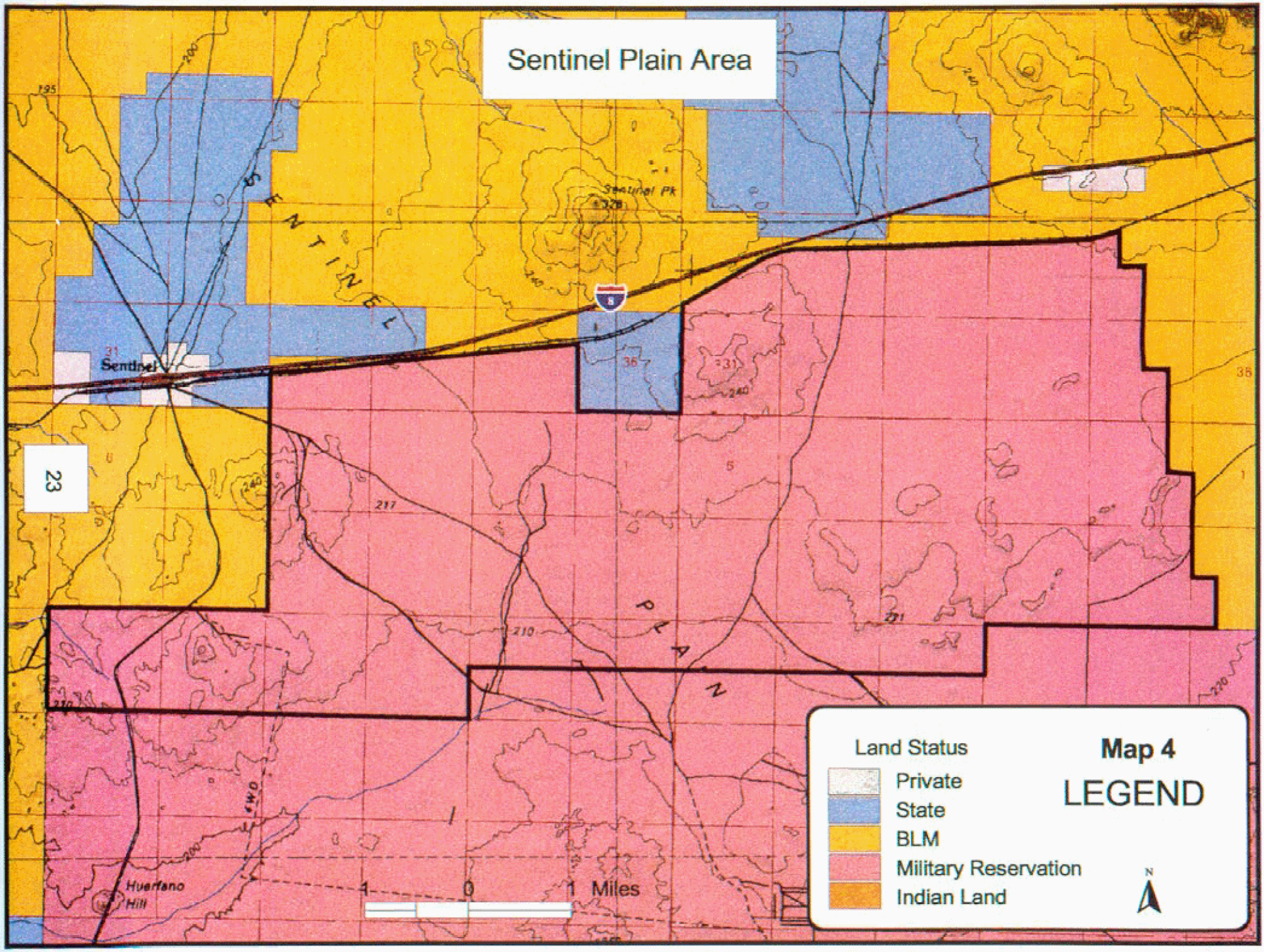
Although geologically young and somewhat lacking in diversity, Sentinel Plain has been used by humans and wildlife for many years and has values as described below.

Cultural Resources

Comparatively little cultural resources work has been carried out on Sentinel Plain. Unlike Area 1, Sentinel Plain has not been the focus of any large-scale potential development. No "crisis situations" have required large-scale inventory work. The area is essentially unchanged from prehistoric times, but we have comparatively little knowledge of the area's past uses. One cultural resource inventory has been conducted in the area. This report relies on that inventory for site-specific information.

The overall history of the Goldwater Range, as presented in the introduction to this report, applies to Sentinel Plain. Sentinel Plain is part of the western Papagueria, where early Spanish and Anglo settlers found Native American cultures, including the Hia-Ced O'odham and Maricopa. The Hia-Ced O'odham were following a mobile gathering and hunting lifestyle, ranging from the non-riverine deserts to near the Gulf of California (Bayman 1992). The Hia-Ced O'odham tended to inhabit the non-riverine desert regions such as Sentinel Plain. The Maricopa practiced flood water farming along the Gila and Colorado rivers.

Under a contract with BLM, Bayman (1992) ran a series of three east-west trending transect surveys across the Sentinel Plain parcel. These transects cut across two environmental zones–rolling volcanic hills and a lower playa–and discovered five sites and 21 isolated occurrences. The artifact scatters at the sites included different combinations of pottery sherds, lithics, and ground stone. Several of these sites contained fire-cracked rock clusters or scatters that appear to have been hearths. The presence of these features suggest that subsurface deposits and other features may be present at some or all of the sites. While the ceramics found at these and the other sites Bayman studied in the western Papagueria were of Hohokam


Sentinel Plain Area
Sentinel
Sentinel Pk
Huerfano Hill
23
Land Status
Private
State
BLM
Military Reservation
Indian Land
Map 4
LEGEND
1 0 1 Miles
N

and Lowland Patyan origin, neither appeared to be dominant. Some sites had both types of ceramics. We do not know if the presence of both types means simultaneous occupation, occupation at different times, or simply trade among groups. Bayman suggests that subsurface features may help determine who occupied the Sentinel Plain area, and when. Bayman concludes that the sites and isolated artifacts on Sentinel Plain show that prehistoric peoples heavily used the area for processing plants and possibly camping. Bayman (1992) judged many of these prehistoric sites as potentially eligible for inclusion on the National Register of Historic Places.

Historical artifacts encountered in Bayman's work included only four apparently 1940s vintage automobile bodies that appeared to have been used as shooting targets.

Despite the comparatively small amount of archaeological and cultural information about Sentinel Plain, this parcel is likely to have significant features of importance to one or more Native American groups. Access to it will continue to be of importance to these groups.

Vegetation

Sentinel Plain is nearly the opposite of Area 1 in its topographic and plant diversity. Sentinel Plan is essentially flat, with elevations gently ranging from 720 to 790 feet above sea level. One hill, likely one of the volcanos, gently rises to 850 feet. The almost flat landscape is broken by shallow dry washes. This lack of topographic diversity, combined with the arid environment (less than five inches of rain per year), limits the variety and stature of the vegetation present.

The area is within the creosote/bursage plant association (University of Arizona 1986; BLM 1990), and even this vegetation is comparatively sparse, due again to the environment. This creosote/bursage community is broken by an occasional saguaro or cholla cactus and by a few palo verde, ironwood, and mesquite trees.

Sentinel Plain does support small grassy areas. Big galleta grass and palo verde trees grow in low areas and swales where some soil accumulates (SWNRMC 2000). These swales are quite lush compared to the surrounding vegetation.

The stands of grass on Sentinel Plain appear to be vigorous, even given the harshness of the environment. This is likely because the Goldwater Range has been closed to livestock grazing for many years. Grazing can easily affect vegetation in as harsh an environment as present on Sentinel Plain. The absence of livestock has helped maintain the pristine, if austere, conditions.

Water and Riparian Areas

The Sentinel Plain is in an extremely arid environment. It has no surface water and only one well (ARCADIS Geraghty & Miller 1998a). Dry washes and other areas where water accumulates support xero-riparian habitats that are the focus of avian and other wildlife.

Wildlife Management

As the agency with jurisdiction, the Arizona Game and Fish Department (AGFD) is the main wildlife managing agency for Sentinel Plain, which is within AGFD's Unit 40B. But little wildlife management work occurs within this portion of Sentinel Plain. In addition, as discussed below, this parcel is essentially closed to public access, meaning little or no wildlife is harvested there.

Wildlife

As with plants, the lack of topographic diversity on the Sentinel Plain parcel adversely affects faunal diversity. There have been no site-specific studies of wildlife species present, and the environment is so much more harsh than the environment of the areas with specific studies that there can be little comparison between them and the Sentinel Plain parcel. Only species adapted to the creosote/bursage plant community are likely to be present, and even they should to be comparatively few and far between. All groups of vertebrates are likely to be present, but the overall species diversity would be much less than in Area 1.

The fauna present represents the natural animal community, in that little outside or human-caused influences have degraded or affected most of the area for almost 60 years.

The only species of concern ever likely to be present on Sentinel Plain is the endangered Sonoran pronghorn. Sentinel Plain is on the fringe of this species' present range, and no physical barriers prevent pronghorn from traveling there. But most pronghorn range maps exclude this area, which would never have the water to support pronghorn. In addition, except in wet years, the area is not likely to have enough forage to support pronghorn or give them reason to remain.

Recreation

The Sentinel Plain parcel is part of a special recreation management area (SRMA) that BLM designated in its land use plan for the Goldwater Range (BLM 1990). BLM designated the Sentinel Plain Lava Flow SRMA to recognize the area's somewhat unusual volcanic nature. But the public has never been allowed to use the SRMA for recreational or other purposes.

The Sentinel Plain parcel is closed to the public, except with special permission. The Air Force instituted this closure because of the parcel's proximity to Manned Range 4, where live and inert munitions are routinely used. Munitions could encroach onto the parcel, creating hazardous conditions. There thus has been little or no public recreation on this parcel for many years.

With its harsh, unforgiving environment, Sentinel Plain does not lend itself to many forms of recreation. The Air Force has stated its need for future land managers to restrict public access on this land after relinquishment for safety reasons. If the future manager fulfills this need, there could be little opportunity for public recreation in the future.

Sentinel Plain is a highly visible part of the Goldwater Range. It lies along Interstate Highway 8, and many people look out over it each year. Most are likely unaware of its being part of the Range, or of any other aspect of its significance. According to the Air Force, Sentinel Plain is a Class B landscape (Lands of Common or Average Diversity and/or Interest) (USAF 1999).

Wilderness

The lands within Sentinel Plain were not inventoried for wilderness suitability when BLM inventoried its public lands in the 1970s and 1980s under Section 603 of the Federal Land Policy and Management Act of 1976 (FLPMA). BLM determined that the military mission of Sentinel Plain as part of the Goldwater Range was incompatible with wilderness. Now that it appears Sentinel Plain will be relinquished by the Air Force, such an inventory could occur.

As part of its ongoing management of the Goldwater Range, BLM has inventoried Sentinel Plain to locate and map all existing vehicle routes. Using the Recreation Opportunity Spectrum (ROS) program, explained in the material on Area 1, BLM conducted an analysis to determine if any of the lands within Sentinel Plain

met the basic Wilderness Act criteria of being roadless and consisting of at least 5,000 acres. The ROS program found a single block of roadless land exceeding 5,000 acres (see Map 5).

This single block must be considered only a gross indicator of the amount of Sentinel Plain land that could qualify for wilderness designation. The actual amount could be more, less, or none. Only a complete wilderness inventory that assesses all wilderness characteristics, as defined by Section 2(c) of the Wilderness Act of 1964, could ascertain if any of the lands truly have wilderness character. Some of the lands within a mile of roads may have wilderness character, thus adding to the total. But that same inventory may show that less or none of the land within Sentinel Plain has wilderness character. Some factors to be considered can be assessed only on the ground. The 5,000-acre requirement is only a threshold that suggests the need to conduct a more indepth study or inventory to assess all wilderness characteristics.

A major contributing factor to lands within Sentinel Plain meeting this minimum qualification for wilderness is that they have been excluded from many of the uses to which adjacent or nearby public lands have been subjected. The 50-60 year absence of mining and mineral exploration, livestock grazing, and the level of control placed on recreational use has helped maintain the relatively natural condition of these lands. The absence of these uses has helped minimize vehicle route development and other surface disturbance.

Minerals and Mining

The Goldwater Range has been withdrawn from mineral entry since its first withdrawals in the early 1940s. In support of the development of the LEIS (USAF 1999) and the later withdrawal application for the Range, a mineral potential report was prepared (ARCADIS Geraghty & Miller 1998b). But this report did not assess Sentinel Plain's mineral potential.

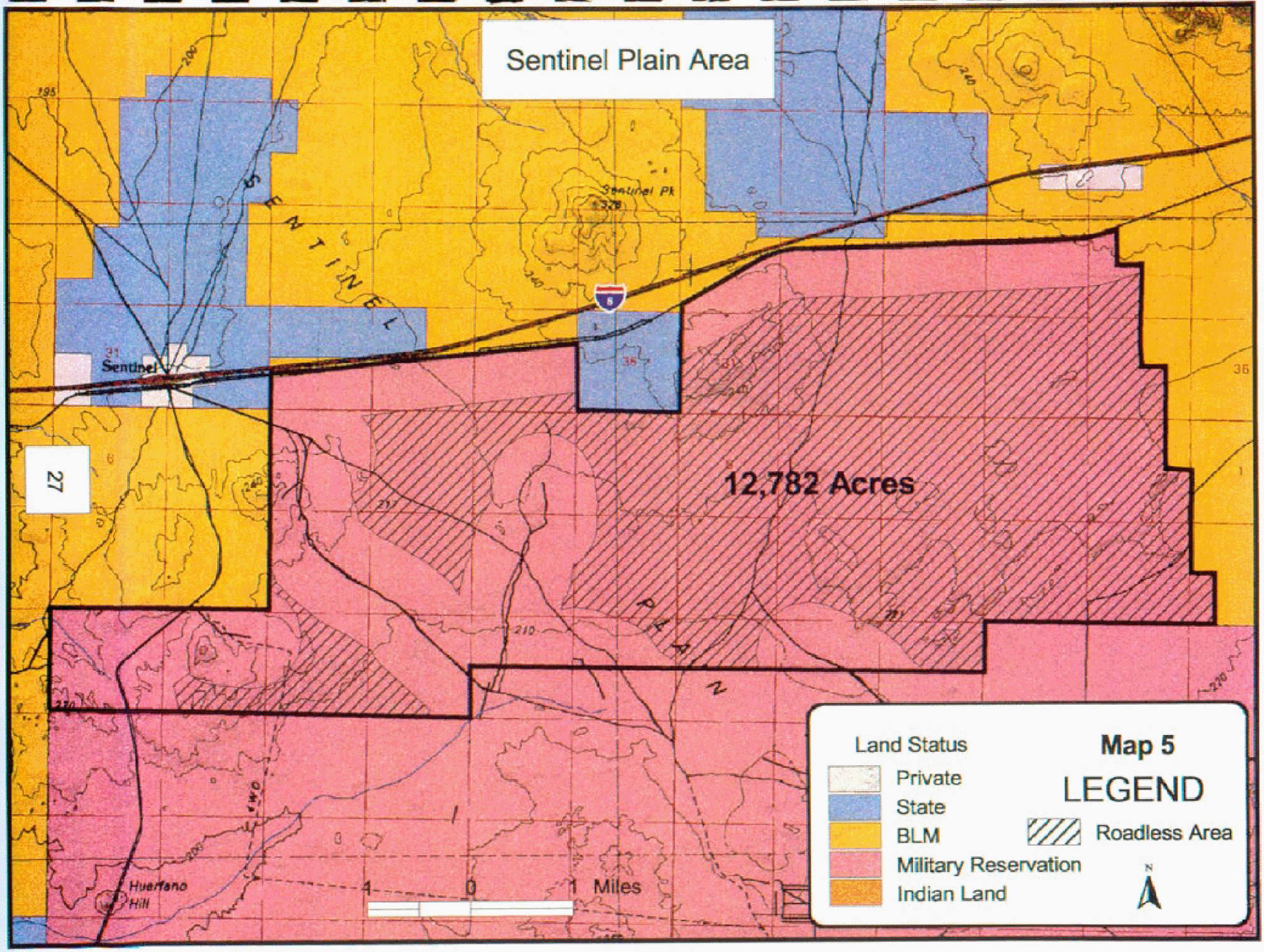
The Arizona Department of Mines and Mineral Resources (ADMMR 2000) provided information on mining and mineral extraction, including sand and gravel, for the parcels being relinquished, including Sentinel Plain. ADMMR did not report any mining or mineral extraction sites on the portion of Sentinel Plain that is being relinquished. ADMMR did, however, provide information on sand and gravel operations on adjacent Sentinel Plain lands, showing at least the potential for producing this mineral type on these lands. ADMMR recommended that the area (1) be examined using modern exploration techniques to determine if mineral resources are present and (2) be opened to mineral extraction under conditions to minimize public safety hazards.

Access

Sentinel Plain is not open to public recreational use.

The Sentinel Plain parcel has road access from the north and south, but Interstate Highway 8 and a railroad right-of-way on the north limit access to one road in the northwest corner. The southern access routes are controlled by the Air Force because they cross Manned Range 4 or other parts of the Goldwater Range. Off-highway vehicles are limited to established roads on Sentinel Plain. All roads, most of which receive little use and are naturally being reclaimed, are primitive two-track trails suitable only for four-wheel drive vehicles.

Because Sentinel Plain serves as an access and encroachment control for Manned Range 4, the Air Force stated in the LEIS that Sentinel Plain's exclusion from the withdrawal was contingent on the area's management to maintain this access and encroachment control function (USAF 1999, page 2-40). The Air Force recently reiterated its position that Sentinel Plain serves as a safety buffer for the Goldwater Range and recommended that access to the area remain controlled (USAF 2000).


Sentinel Plain Area
12,782 Acres
Land Status
Private
State
BLM
Military Reservation
Indian Land
Map 5
LEGEND
Roadless Area
N
1 0 1 Miles
Sentinel
Sentinel Pk
Huerfano Hill
27

Military Mission

The Air Force has said that it can relinquish Sentinel Plain because (1) the area does not underlie restricted airspace and (2) the Air Force does not use the lands within the area to achieve its mission. Nevertheless, in the LEIS (USAF 1999), the Air Force did place as a contingency on the relinquishment that the lands continue to be managed to provide an access and encroachment control function for the adjacent Range. More recently, the Air Force expressed similar concerns in a letter to BLM (USAF 2000). The airspace above Sentinel Plain is important to the Air Force in that it facilitates the use of adjacent Manned Range 4. While the airspace is not restricted, without it the use of Manned Range 4 would be compromised. In addition, both live and inert munitions are used on Manned Range 4. The aim point for some of these munitions is within 4 miles of Sentinel Plain. In the past, some munitions may have missed their mark and impacted in Sentinel Plain. This could happen again in the future. In addition, munitions could be buried there from years past.

Thus, the Air Force has used Sentinel Plain as an access and encroachment control feature for Manned Range 4 by limiting access and use. The Air Force stated that its relinquishment of Sentinel Plain is contingent upon access remaining restricted so that the area can continue to serve that function. While P.L. 106-65 requires the relinquishment with or without that contingency being fulfilled, it is still of importance to the military mission that the contingency be considered in the present process and in future land management.

While the use of the adjacent Goldwater Range can affect Sentinel Plain, conversely and just as importantly, unsuitable land uses on Sentinel Plain would have major impacts on the military mission on the adjacent Range. Thus, the Air Force has suggested that future management of Sentinel Plain include only uses that would be compatible with that mission. The Air Force suggests that low-intensity recreation and resource preservation management would be compatible with future uses of the land and that livestock grazing, mining and mineral exploration, agriculture, residential or commercial development, and high-intensity recreational use would be incompatible (USAF 2000).

Scientific Values

Sentinel Plain has been closed to many uses that occur on most publicly owned land in Arizona. The area has thus largely escaped the fragmentation, development, and in some cases degradation that has afflicted much of the Sonoran Desert over the past 60 years. Most of Sentinel Plain is in essence a pristine landscape, a rare commodity over much of the desert Southwest.

Sentinel Plain is a large block of essentially unaltered landscape that already has in place controls on most of the uses that could degrade it but has the access needed to facilitate study. Sentinel Plain thus offers a unique opportunity for scientific research into a variety of ecological, environmental, archaeological, cultural, social, and economic issues. Its location places it near both Arizona State University and the University of Arizona, as well as the Maricopa and Pima county community college systems. Sentinel Plain's location west of Interstate Highway 10 on Interstate Highway 8 and along Interstate Highway 8 makes it readily accessible from both Phoenix and Tucson, and from Yuma, Arizona, which also has a community college system and a branch of Northern Arizona University. In short, Sentinel Plain presents an opportunity for learning about our world, an opportunity that would be difficult if not impossible to duplicate elsewhere in the Sonoran Desert.

Ecoregion Conservation

Sentinel Plain is not part of any of the 100 conservation sites described by The Nature Conservancy in its Sonoran Desert Ecoregion Analysis.

AJO AIRPORT PARCEL (Map 6; Appendix 2, Figures 11, 12)

The Ajo Airport relinquishment parcel consists of 2,779 acres just north of Ajo, Arizona, adjoining Arizona Highway 85. The area includes several connected parcels that remained part of the Goldwater Range after the World War II military airfield in the center of the larger parcel was deeded to Pima County in 1976. The former military airfield continues to be used as a civilian airport. These remaining Goldwater Range parcels surround the county's airport parcel on three sides, with Highway 85 bounding the fourth side. Map 6 shows the arrangement. In addition to the airport, the approximately 1400-acre county parcel contains the Ajo Country Club and golf course and other buildings.

A significant feature of this parcel of land is its proximity to the unincorporated town of Ajo. Ajo's population was 2,990 in the 1990 census and has grown since then. It varies considerably through the year. Many people spend the winter in Ajo and return to their cooler northern homes for summer.

Ajo lies in an isolated area of Pima County within a 191,000-acre block of BLM-administered public land, which is in turn surrounded by the Goldwater Range, Cabeza Prieta National Wildlife Refuge, Organ Pipe Cactus National Monument, and the Tohono O'odham Reservation.

With the closing of Phelps Dodge, Incorporated's New Cornelia copper mine in 1986, Ajo's economy has come to focus on services and tourism. Ajo has little industry, and its expansion is limited by the lack of private land.

The Ajo Airport parcel is essentially flat. It has no hills or deep washes, but several small washes and a major wash system (Tenmile Wash) cross it. Elevation ranges from 1,311 to 1,480 feet above sea level. The exception is the extreme northeast corner, which includes a few acres in the lower slopes of the Batamote Mountains, rising quickly to a maximum elevation of 1,640 feet above sea level.

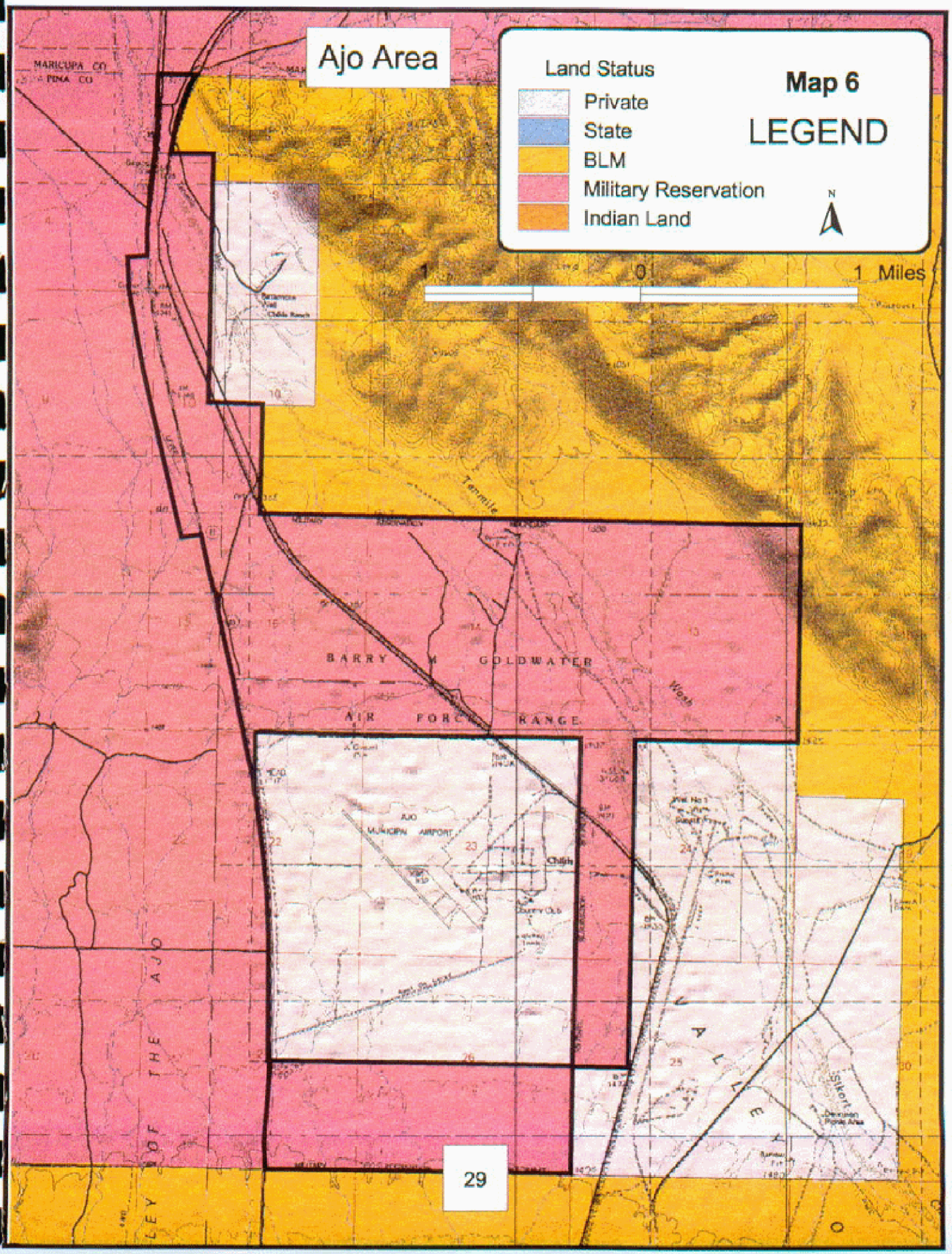
Cultural Resources

No cultural resource inventories have been conducted on the Ajo Airport parcel, and no information exists on cultural or archaeological sites there. The site is near the boundary between the eastern and western Papagueria (Bayman 1992). The general area was used by the Hia-Ced O'odham people, who had a village south of Ajo, at Darby Wells. Near Darby Wells they have acquired a cemetery where their ancestors are buried. They are also interested in acquiring other traditional lands in the area.

Access to their ancestral home is of great importance to the Childs family, an pioneer family in the Ajo area that still has many members living there. The home is on their private land, next to the north end of the Ajo Airport parcel (see Map 6). Thomas Childs originally settled on the property in the late 1800s and married and raised 12 children there. Members of the Childs family lived on the property until 1998. The main access to the private land, which also contains the family cemetery, crosses the Ajo Airport parcel. Members of the Childs family continue to frequently visit their home and still bury deceased family members family there. Being able to use this place, with access across the Ajo Airport parcel, is of high importance to the family's continuing its traditions and culture.

Vegetation

Vegetation on the Ajo Airport parcel consists of the palo verde/saguaro cactus association (University of Arizona 1986). Vegetation is similar to the plant community in Area 1 but lacks much of Area 1's diversity and density. The lack of diversity is due largely to the lack of topographic and geologic diversity on the parcel. The plant community is by and large healthy. The area is grazed to a small extent by livestock because it is not fenced to exclude them.


Ajo Area
Land Status
Private
State
BLM
Military Reservation
Indian Land
Map 6
LEGEND
N
1 0 1 Miles
MARICOPA CO
PIMA CO
BARRY M GOLDWATER
AIR FORCE RANGE
AJO MUNICIPAL AIRPORT
LEY OF THE AJO
VALLEY

Water and Riparian Areas

The Ajo Airport parcels have no sources of either surface or ground water (wells) (ARCADIS Geraghty & Miller 1998a). Ground water is nearby. Wells are producing water near the parcels on the east side.

Tenmile Wash, one of the major drainages for the entire Ajo area, crosses the Ajo Airport parcel in two places. This wash, which carries water only after heavy rains, supports a significant xero-riparian habitat. Having the most lush habitat on the parcel, this habitat's vegetation consists of large palo-verde, ironwood, and other desert trees.

Wildlife Management

As the agency with jurisdiction, the Arizona Game and Fish Department (AGFD) is the main wildlife managing agency for the Ajo Airport parcel, which is within AGFD's Unit 40A. But little wildlife management work occurs within this unit because it is small and receives much human use.

Wildlife

One would expect to find on this parcel the normal complement of wildlife species adapted to the palo-verde/saguaro cactus association. The parcel's closeness to Ajo, the airport, and nearby residences is likely to reduce both the number and diversity of animals. As with any area in the Sonoran Desert, resident animals are present in varying numbers, depending upon the time of year and the previous months' precipitation. The area would support migrating neotropical birds in spring and fall.

The Ajo Airport parcels have three potential species of special concern. None are known to use the parcels, but their potential presence is a consideration in any future management. The parcels, particularly the Tenmile Wash area, are potential habitat for the cactus ferruginous pygmy-owl, which is known to occupy habitat a few miles south on the north edge of Organ Pipe Cactus National Monument. Tenmile Wash has been surveyed for the owl, but none have been found. Lessor long-nosed bats, an endangered species, could be foraging on saguaro cactus flowers and fruit on the parcels, since there is a known maternity roost for the lesser long-nosed bat some 16-17 miles southeast of the parcels. The parcels are well within this bat's known foraging distance and it is known to fly to northern parts of the Goldwater Range to forage (Dalton et al. 1994), possibly taking it over the parcels. The third potential species of concern is the Sonoran pronghorn. This species is known to use habitat on the adjacent Cabeza Prieta National Wildlife Refuge and has at least occasionally ventured onto nearby BLM-administered public lands. But these pronghorn have not been reported using these parcels in modern times.

Recreation

The Ajo Airport parcels are not officially open to recreation use, but recreational use of the lands has been promoted by the following:

- The proximity of the parcels to Ajo, the airport, the country club, and nearby residences.
- The lack of any military activity.
- Excellent road access.

An informal picnic area exists on the northern edge, along Tenmile Wash, and motorized recreation occurs on the road network within the parcels.
Wilderness

The Ajo Airport parcels consist of less than 5,000 acres and appear to lack any wilderness characteristics. The parcels contain an airport and paved roads and are adjacent to a heavily used state highway. In addition, a railroad passes through the area. These parcels are thus is not likely to be considered for wilderness study.

Minerals and Mining

The Goldwater Range has been withdrawn from mineral entry since its first withdrawals in the early 1940s. In support of the development of the LEIS (USAF 1999) and the later withdrawal application for the Range, a mineral potential report was prepared (ARCADIS Geraghty & Miller 1998b). The report did not assess the mineral potential for the Ajo Airport parcels but did examine the potential of the nearby Childs Valley and Valley of the Ajo in which the parcels lie. The report found no potential for mineral resources in either area. A gravel pit has been dug in Tenmile Wash just north of the parcels, and the potential exists for sand and gravel production from the wash within the parcels.

Access

There is no need to provide for access control on the Ajo Airport parcels to facilitate achieving the military mission of the Goldwater Range.

There is much physical access to the parcels, with a paved road and several two-track roads.

The Childs family uses a two-track road from Highway 85 just north of the Tenmile Wash bridge to access their home property. This two-track road crosses the Ajo Airport parcels in two places. The property can be accessed via another two-track road, but it too crosses the parcels and is too rough for passenger vehicles. The Childs family depends on the main access to continue its traditions and culture as they relate to the home property.

Military Mission

The Air Force stated in its LEIS that it "could accept non-renewal of the Ajo Airport area without stipulations" (USAF 1999). Other than to overfly the parcels, the Air Force has not used these lands for many years. They do not serve an access and encroachment control function for any of the active ranges on the Goldwater Range, as do Area 1 and Sentinel Plain.

The Air Force mission will not affect the parcels, and activity on the parcels is not likely to affect the Air Force mission.

Scientific Values

The Ajo Airport parcels have no known scientific values, including no unique vegetation, topographic, or faunal characteristics.

Ecoregion Conservation

The Ajo Airport parcels are not within of any of the 100 conservation sites described by The Nature Conservancy in its Sonoran Desert Ecoregion Analysis.

INTERSTATE 8 PARCELS (Map 7; Appendix 2, Figures 13-14)

The Interstate 8 relinquishment parcels consist of 1,090 acres of land along Interstate Highway 8, about 5 miles west of Dateland, Arizona, and reaching to the Avenue 52E/I-8 intersection. These several connected parcels form a stair-step pattern along Interstate 8. This land pattern resulted from the original military withdrawal in 1943, which was drawn along legal boundaries. Thus aliquot parts of sections were withdrawn. Since the boundary was on an angle (i.e. not north-south or east-west) following the railroad, "steps" were formed. Map 7 shows this pattern.

The lands to be relinquished actually straddle Interstate 8. The southern boundary of the parcels is at the southern edge of the Union Pacific Railroad right-of-way. From this boundary going north are the following:

- A buried telephone line right-of-way.
- The railroad right-of-way.
- An overhead telephone right-of-way.
- Another buried telephone (fiber optic) right-of-way.
- The graveled frontage road on the south side of Interstate 8.
- Interstate 8 and its right-of-way.
- The paved frontage road on the north side of Interstate 8.
- An overhead powerline right-of-way.

Also within the lands to be relinquished are two Arizona Department of Transportation highway rest stops, one with an occupied maintenance worker's residence on it.

Another interesting factor in the story of these parcels is that they are not all in federal ownership. Map 7 shows that the parcels in white are privately owned and those in blue are owned by the State of Arizona. The highway rest stops are on state land. The early withdrawals were made to facilitate the military mission and were apparently done without regard to surface ownership. The withdrawals affected only the federal interest in the lands, not the private or state interest.

Moreover, the withdrawal of the Goldwater Range by the Military Lands Withdrawal Act of 1986 (P.L. 99-606) does not include these lands. They are not presently withdrawn for military purposes. But there is no conclusive evidence that earlier withdrawals, which did include these lands, were ever revoked. Thus, to assure clear title to the lands, the present process is being carried out to revoke all previous military-related land withdrawals on them. This action will not affect the several rights-of-way listed above. When the withdrawal review process is complete, there may be no remaining military or federal interest in these lands to relinquish.

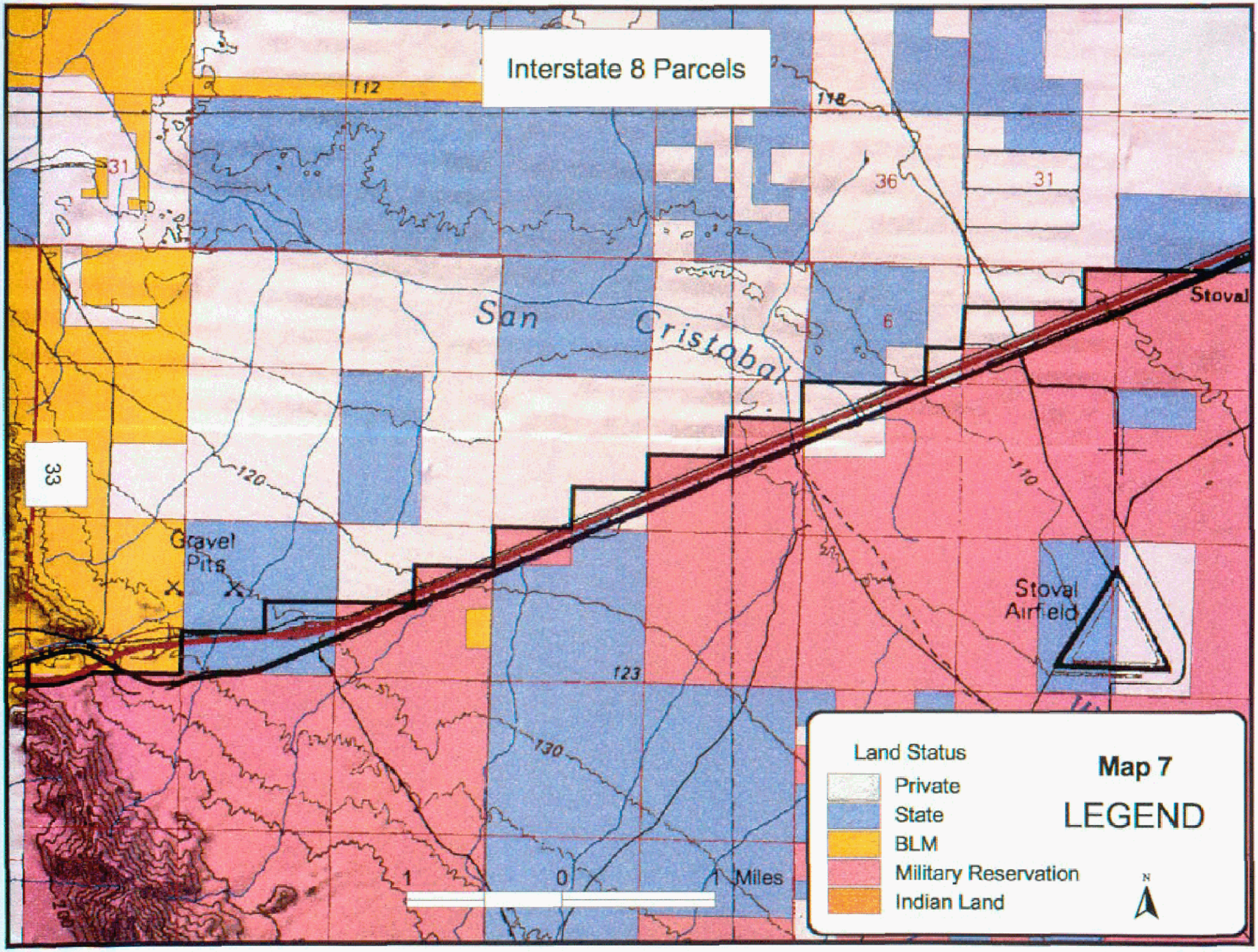
There are occupied dwellings on private land next to the Interstate 8 parcels, on the western end. One of the withdrawn private parcels on the eastern end has a "Lots For Sale" sign on it.

Cultural Resources

No cultural resource inventories have been conducted on the Interstate 8 parcels and thus there is no information on any cultural or archaeological sites that may exist there.

Vegetation

Much of the surface on these parcels consist of semi-stable dunes. There are few established plants, other than isolated individuals. As an indication that the dunes are still at least partially active, some plants have been undercut and are standing on a mass of exposed roots. The normal ground surface point is several inches to a foot or more above the present ground surface.


Interstate 8 Parcels
San Cristobal
Stoval
Gravel Pits
Stoval Airfield
33
31
36
6
112
120
110
123
130
1 0 1 Miles
Land Status
Private
State
BLM
Military Reservation
Indian Land
Map 7
LEGEND
N

The dunes support small patches of big galleta grass along with a few creosote bushes and assorted other shrubs. But the aspect, other than in the lower, wetter spots as described in the next section, is of bare sand. The nondune areas of the parcels are in the creosote/bursage association, with low species diversity and low vegetative density.

Water and Riparian Areas

No sources of surface or ground water (wells) were found on the Interstate 8 parcels (ARCADIS Geraghty & Miller 1998a).

One area along the north frontage road, where San Cristobal Wash runs north, has dense stands of mesquite trees and an understory of big galleta grass. This is the only xero-riparian habitat on these parcels and may or may not be on the parcels to be relinquished. This spot would harbor migrating birds during spring and fall and is likely the focal point of wildlife diversity in the area.

Wildlife Management

As the agency with jurisdiction, the Arizona Game and Fish Department (AGFD) is the main wildlife management agency for the Interstate 8 parcels, which are within AGFD's Unit 40B. But little wildlife management work occurs on these lands because of their small size, their arrangement and closeness to Interstate 8, the railroad, and other intrusions.

Wildlife

The dunes show signs of occupation by small mammals and reptiles. Small burrows are common, with trails leading in and out. Predators (coyotes, badgers, and such) are likely to use the area, coming in from surrounding land. The sparsity of vegetation assures that species diversity is comparatively low.

One reptile species of note that could be present is the Colorado Desert fringe-toed lizard. This small lizard is adapted to dune habitat and inhabits the Mohawk Dunes a few miles to the west (BLM 1990). So far as is known, no surveys for this species have been conducted on the Interstate 8 parcels.

No known species of special concern use these parcels, but one should expect to find some or all of the plants found in the Mohawk Dunes, several miles to the west. Included are Schott's wire lettuce and sand food (BLM 1990). Neither is a listed species, but both are of some concern because they are limited to dune habitats.

Recreation

Recreational use of these parcels has not been determined. Because of their location and absence of access controls, some recreation is likely to occur on them, mainly by the people who live in the immediate area.

Wilderness

The Interstate 8 parcels encompass less than 5,000 acres and at least appear to lack other wilderness characteristics. All parcels are within 1/4 mile of Interstate 8 and the railroad and are not likely to be considered for wilderness study.

Minerals and Mining

The Interstate 8 parcels lie within the San Cristobal Valley. The mineral potential survey by ARCADIS Geraghty & Miller (1998b) found no potential mineral resources in their San Cristobal Valley study unit.

Access

There is no need for present or future encroachment and access control on the Interstate 8 parcels to protect the military mission on adjacent Goldwater Range lands. Both the Air Force and Marine Corps use the south Interstate 8 frontage road to access the Range.

Access to these parcels is from Interstate 8's north and south frontage roads, both with access from either Dateland or the Avenue 52E/I-8 intersection.

Military Mission

The Air Force has said that it has no military need for the Interstate 8 parcels and can relinquish them without the need for continued access and encroachment control measures. But both the Air Force and the Marine Corps use the south Interstate 8 frontage road to access parts of the Goldwater Range east of the Mohawk Mountains.

Scientific Values

The Interstate 8 parcels have no known scientific value. While some of the parcels have dunes, the amount of dune habitat is small, and the adjacent Goldwater Range has many thousands of acres of dune habitat. Any needed research on dunes or dune habitat could be conducted on the Range where the research would not be subject to the impact of vandalism or use that could occur on the readily accessible and small Interstate 8 parcels.

Ecoregion Conservation

The Interstate 8 parcels are not within of any of the 100 conservation sites described by The Nature Conservancy in its Sonoran Desert Ecoregion Analysis.

APPROPRIATE MANAGEMENT AND PROTECTION

Section 3031 (a)(7)(A) of the Military Lands Withdrawal Act of 1999 requires that the Secretary of the Interior conduct a study of the lands in order to determine the "appropriate method to manage and protect" them following their relinquishment by the Secretary of the Air Force. The preceding sections of this document have described the resources and uses on the four parcels to be relinquished by the Air Force. This section describes what BLM considers to be the appropriate management and protection for these parcels, given the already described resources and uses.

Cultural Resources

All of the studied lands have or may have aboriginal, cultural, and archaeological significance. All were in use or were within the areas used by one or more Native American groups, including the Tohono O'odham and the Hia-Ced O'odham, at the time of Anglo-American settlement of the region (see Attachment 1). The archaeological work on Area 1 and Sentinel Plain clearly shows the past use of these areas and that they have significant archeological sites. Examination might also find such sites on the Ajo Airport and Interstate 8 parcels, but the lack of such examination prevents definitive statements at this time on the aboriginal, cultural, and archaeological significance of these parcels.

These lands have or potentially have cultural significance to 22 Native American tribes and groups. In acquiring information for future management of the Goldwater Range, the Air Force contacted Native American tribes and groups to ascertain if they have traditional cultural properties (TCPs) or sacred sites on the range and to allow them to provide ethnohistoric information from their own perspective. The Air Force contacted 26 tribes and groups, including all 21 federally recognized tribes in Arizona, the Hia-Ced O'odham Alliance, and groups in surrounding states. Only four tribes or groups have said that they have no interest in the Range, that they have no affinity with past inhabitants or users of the area. The balance of the groups have said either that they have or may have affinity with past inhabitants or users of the Range or that they are still evaluating the potential for affinity claims (USAF 1999).

Traditional cultural properties or sacred sites have been recognized in Area 1 and could be identified on any of the other parcels. The Goldwater Range is or potentially is of cultural significance to all these groups. All the groups should be allowed access to the lands to continue their work or access sites of cultural or religious significance to them. In addition, the Bender and Childs families should have access to or across Area 1 and the Ajo Airport parcels, respectively, to continue to maintain their family cultures. Any future management should address these access needs.

The degree of cultural significance for any of the four parcels can be determined only through consultation with Native American groups and tribes and through study of the cultural resource sites on the lands in question. Some of these sites are potentially eligible for inclusion on the National Register of Historic Places. Although much work has been done in Area 1 and a little work has been done in Sentinel Plain, no work has been done on the other two sets of parcels. At least one Native American group has expressed concern that the Federal Government might be considering disposal of any or all of these lands without full knowledge of the sites and values that may be on them. Any action affecting these four parcels should be subject to Native American consultation.

Area 1 contains remarkable and diverse cultural sites worthy of protection. When combined with adjacent BLM-administered lands, these cultural sites, including artifacts, hamlets, lithic procurement sites, campsites, trails, food collection and processing sites, rock shelters, village sites, rock art sites, and agricultural sites, demand protection and scientific study.

Vegetation, Water and Riparian Areas, and Wildlife

From an environmental resource viewpoint, two of the parcels–Area 1 and Sentinel Plain–have significant environmental resources that should be protected. The military withdrawal and land use restrictions have been in place for more than 50 years, protecting these lands from the impacts and development inflicted on much of the surrounding Sonoran Desert. This document provides a clear statement of the resources on these two parcels, resources that in some cases are unparalleled in the region.

The pristine vegetation communities, essentially ungrazed and unused for 50-60 years, provide a glimpse of the Sonoran Desert's potential for species and habitat diversity and density. At least in Area 1, these communities hold a repository of information on plant communities from the more mesic times of the distant past. The diverse plant communities, in excellent condition, provide habitat that supports an equally diverse wildlife community. We need to preserve for the future these plant communities, the habitat and wildlife species they support, and their potential for assisting in endangered species recovery. To do this, land uses that would adversely impact these resources and values, such as livestock grazing, mineral exploration and mining, major rights-of-way, and unrestricted recreation and access should be prohibited. If Area 1 were to be combined with adjacent BLM-administered lands and protected through legislative or administrative conservation designation, the American people would be assured of a complete Sonoran Desert ecoysystem with its accompanying species and habitat diversity for present and future generations.

Wildlife Management

Under provisions of state law, Arizona Game and Fish Department manages wildlife on the parcels. The Department carries out this work in cooperation with the Air Force, BLM and other agencies and non-governmental groups. The Department has carried out its work without interfering with the military mission on the lands and adjacent Range. The jurisdiction of the Arizona Game and Fish Department over wildlife on the four parcels should be allowed to continue in cooperation with the Bureau of Land Management and others.

Recreation

Area 1 provides for controlled recreational opportunities that are prized by people from the local area and throughout the region. Almost universally, they express a strong desire to see existing recreational uses and access preserved and to be able to continue using the land in the manner to which they are accustomed. This use has been accommodated within the framework of the military withdrawal and the military's need for access and encroachment control. It is highly likely that recreational use could be so accommodated under most future management scenarios. Sentinel Plain may be able to support some limited level of recreational use without interfering with the military mission on adjacent lands. Off-highway vehicle use has been limited to existing roads and trails, which has helped to maintain the relatively pristine condition of the lands. Similar limitations on off-highway vehicle use will help preserve that condition and should be a part of future management.

Wilderness/Other Designations

Area 1 and Sentinel Plain both have roadless areas exceeding 5,000 acres. If these areas are retained in federal administration, the managing agency should study both areas to determine if they meet all requirements for designation as wilderness.

Area 1 also contains all the cultural, biological and historical resources associated with either National Monument or National Conservation Area protection.

Minerals and Mining

There is no clear indication that the parcels have significant mineral resources. Area 1 produced minerals before military withdrawal, but this was largely copper, a mineral now in abundant supply in the world. Mineral exploration and development would harm the vegetation community and the wildlife it supports, along with the cultural and archaeological values present. Both Area 1 and Sentinel Plain should continue to be protected from mineral exploration and mining.

Military Mission

Loss of the access and encroachment control now provided by Area 1 and Sentinel Plain to adjacent Goldwater Range lands could compromise the Range's military mission. This function is important to maintaining the Air Force's safe and uninterrupted operations on adjacent and near-by live fire ranges. Loss of that function could lessen the usefulness of the Goldwater Range, with unknown future consequences. The current access and encroachment control should be maintained under future management. This goal could be met by maintaining or modifying the existing situation in which the public has access to Area 1 only under specific conditions. This program may be expandable to support some public use on Sentinel Plain. Although not restricted, the airspace over these parcels is used by the Air Force in their use of adjacent Goldwater Range targets; access to and use of that airspace should not be compromised under future management.

There are no reasons beyond those normally in place for public lands to limit public use on the Ajo Airport and Interstate 8 parcels. The Air Force and Marine Corps use the southern Interstate 8 frontage road to access the Range east of the Mohawk Mountains. Future management should accommodate that use.

Scientific Values

Both Area 1 and Sentinel Plain offer opportunity for scientific research into a variety of areas. These relatively pristine areas have in place access controls, which should remain in place to assure that the scientific research opportunity is not compromised. These areas offer environments largely unaffected by a variety of land uses. Such areas could be the subject of ecological research or could be used in comparison studies of impacts on other lands. These areas also are readily accessible to two major universities and to many community colleges. They offer research opportunities under conditions that exist nowhere else in the Sonoran Desert.

Ecoregion Conservation

Area 1 provides an opportunity to preserve a significant portion of The Nature Conservancy's Conservation Site 32, which is a large part of the Sonoran Desert Ecoregion. Area 1's 83,554 acres contain a significant portion of the conservation targets selected by The Nature Conservancy in its recently published ecological analysis of the Sonoran Desert Ecoregion (Marshall et al. 2000). Preservation of Area 1 would significantly add to the assurance that the ecological values, habitat, and floral and faunal diversity of the Sonoran Desert will be here for succeeding generations.

Summary

The Ajo Airport parcels and the Interstate 8 parcels do not have known resources or uses of the same level of significance as Area 1 and Sentinel Plain. They should be managed at a level of intensity commensurate with public land parcels of similar nature, and in the context of their surroundings. Area 1 and Sentinel Plain should be managed to preserve the resources and uses described in this document. These resources and uses are remarkable and largely irreplaceable and future management should assure they are maintained for future generations. The measures listed below will accomplish this goal.

- Area 1 should be permanently protected through National Monument or National Conservation Area designation, consistent with management prescriptions outlined below. The area should be combined with adjacent BLM-administered lands, including three designated Wilderness Areas, to preserve this Sonoran Desert ecosystem for present and future generations.

- Future management should assure protection of significant cultural sites and continued access for all Native American tribes and groups who have or potentially have affinity with past users of the lands. The Bender and Childs families should be assured access to or across Area 1 and Ajo Airport parcels, respectively. Any action affecting any of these parcels should be the subject of Native American consultations.

- Livestock grazing should continue to be prohibited.

- Mineral exploration and development should continue to be prohibited.

- Major rights-of-way should be prohibited.

- The Arizona Game and Fish Department should be allowed to continue fulfilling its obligations as the agency with jurisdiction over Arizona's wildlife.

- Recreation, as described below, should be allowed on all the parcels to be relinquished.

    - For Area 1, either the existing access control system and limitations, or something similar, should be continued.

    - Whether Sentinel Plain or parts thereof can be open to public recreation, with similar access controls, should be investigated.

    - Public recreation should be allowed with only normal controls on the Ajo Airport and Interstate 8 parcels.

    - No new roads should be built and no major road upgrading should occur in Area 1 or Sentinel Plain.

    - Off-highway vehicle and other vehicle use should continue to be limited to established or designated roads.

- Area 1 and Sentinel Plain lands should be fully evaluated for their wilderness potential.

- The Barry M. Goldwater Range's military mission should be protected by continuing the access and encroachment control now provided by Area 1 and Sentinel Plain and access and use of the airspace over these parcels. The current access and encroachment control should be maintained under future management. The Air Force and Marine Corps should continue to be allowed to use the federal portions of the southern Interstate 8 frontage road for access to the Range.

- Area 1 and Sentinel Plain should be available to the scientific community for use in nonsurface-disturbing research projects. To the extent practicable, the managing entity should promote and support such research.

- Area 1 should be preserved as a significant part of the Sonoran Desert Ecoregion through all the above-cited measures and other measures as may be necessary and practicable.

- The Ajo Airport and Interstate 8 parcels have no apparent significant resources or uses that justify continued protection to the extent proposed for Area 1 and Sentinel Plain. They should be managed at a level of intensity commensurate with public land parcels of similar nature, and in the contexts of their

surroundings and the public interest, and with provision for continued use of the southern Interstate 8 frontage road for military access to the Goldwater Range.

- Consideration should be given to making all or part of the Ajo Airport parcel available for economic development.

MANAGEMENT BY VARIOUS ENTITIES

All of the relinquished lands except part of the Interstate 8 parcels are federal lands withdrawn at this time (or in the past for the Interstate 8 parcels) from the public domain and reserved for use by the Secretary of the Air Force. Upon their relinquishment by the Secretary of the Air Force and acceptance by the Secretary of the Interior, the parcels regain their full status as public domain lands. As such, BLM will manage the lands.

Section 3031 (a)(7)(A) of the Military Lands Withdrawal Act of 1999 requires that this study "shall consider whether such lands (i.e., the four parcels) can be better managed by the Federal Government or through conveyance of such lands to another appropriate entity." It does not address which agencies of the Federal Government should be considered as potential managers and it does not list which other entities should be considered as potential managers. It does, however, indicate that the other entities must be "appropriate." BLM interprets "appropriate" as meaning that the entity should be able to fulfill the "appropriate management and protections" for the land as described in the previous section of this report, and that management by that entity would preserve the resources and uses of the land for present and future generations. Thus, one basic "filter" by which potential managers are considered or not considered is the ability to fulfill the "appropriate management and protections" for the land. Another "filter" is the ability to hold and manage the lands, resources and uses for present and future generations of Americans.

The list of Federal agencies logically can be limited to those that have land and resource management as their mandate: BLM, U.S. Fish and Wildlife Service, National Park Service and the U.S. Forest Service. Of these, the Forest Service is not considered because of the lack of any connection or suggestion of connection with the lands.

Potential non-Federal entities are too numerous to list, but could include tribal, state, county and local governments and agencies, as well as non-governmental organizations, and even private ownership.

Potential tribal entities could include any of the tribes and groups that have affiliation with past inhabitants of the area. However, only the Tohono O'odham Nation has requested that they be considered, and they have provided an extensive report on their capabilities to manage the lands and resources. They are addressed as a potential entity for managing the lands, without regard to the "filters" described above.

Any list of potential state, county and local governments and agencies can be pared by omitting those entities unlikely or unable to fulfill the "appropriate management and protections." The Arizona State Land Department is omitted because its mandate is to generate funds for the public school system. Its resource management is an incidental result of that effort, rather than a primary mandate. Additionally, they regularly sell lands to generate funds and likely could not assure retention of the lands for future generations. The Arizona State Parks Department is not considered because the level of development that typically occurs within a state park to facilitate public use would significantly impact the resources of the lands, as would the levels of public use likely to occur in a developed park. The preservation of the resources and their uses could not be assured under State Parks management. One state agency, the Arizona Game and Fish Department, is considered as a potential managing entity.

The parcels that might be considered for county parks (Area 1, Sentinel Plain and Ajo Airport) lie in Maricopa and Pima Counties. However, the Parks Departments of these two counties are not considered because the level of development that typically occurs within county parks to facilitate public use would significantly degrade the resources of the lands, as would the levels of public use likely to occur in a developed county park. The preservation of the resources and their uses could not be assured under county park management. No local (i.e., municipal) government or agency is considered because it is believed none have, or could commit, the financial resources to manage such large, remote areas.

Potential non-governmental organizations and private owners are not considered because, while some might be able to fulfill most of the "appropriate management and protection" needs of the land, they do not

have processes that include public participation which would assure the lands are held for present and future generations.

Outside of the “filters” described above, one potential entity is considered as a potential owner/manager of one parcel of the lands. This is an unknown entity holding all or part of the Ajo Airport parcel. The Western Pima County Community Council and the Ajo District Chamber of Commerce are on record as requesting that consideration be given to providing part or all of the Ajo Airport parcels to an entity (unknown at this time) that would hold the land for economic development.

The following is a description of how the “appropriate management and protection” described in this document would or could be implemented by each of the above described potential managers: BLM, the Tohono O’odham Nation, the National Park Service, the U.S. Fish and Wildlife Service, Arizona Game and Fish Department, and an unknown entity holding the Ajo Airport parcel.

Bureau of Land Management

Many members of the public and several agencies who commented on the present study suggested that the four parcels be managed by the Bureau of Land Management. BLM has been the primary natural and cultural resource management agency on the Goldwater Range since 1986, when the Military Lands Withdrawal Act of 1986 (P.L. 99-606) placed resource management responsibility with the agency. BLM will continue in that role, under that authority, until that withdrawal is terminated. BLM has worked with the Air Force, Marine Corps, Arizona Game and Fish Department, U.S. Fish and Wildlife Service and several nongovernmental organizations in carrying out its management responsibilities on the Range. In addition, BLM is a participant in the Barry M. Goldwater Range Executive Council (BEC), a group of federal and state agencies with management responsibility on or use of the Range.

BLM’s mission is to “sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.”

BLM’s primary authority for land management is the Federal Land Policy and Management Act of 1976, as amended (FLPMA). This law requires that BLM-administered public lands be managed, among other things, under the principles of multiple use and sustained yield, using land use plans that are developed with public involvement, in coordination with and in consideration of federal and state agency and tribal group policies and plans. Such land use plans are subject to analysis under the National Environmental Policy Act of 1969 (NEPA).

BLM now manages the resources on the Goldwater Range under its Lower Gila South Resource Management Plan (Goldwater Amendment). This land use plan would remain in effect on the four parcels to be relinquished following that relinquishment until a new planning document is completed. The new planning document would address the new status of the land, i.e. its exclusion from the Range, the results of this study, and any new issues or proposals raised during the planning process.

The Goldwater Amendment does not address livestock grazing and mining because these uses are prohibited by P.L. 99-606. Even though not addressed in the land use plan, these uses would continue to be prohibited on the relinquished parcels during the period between relinquishment and BLM’s completion of a new land use plan amendment. P.L. 99-606 (Section 8(f)) requires an opening order to open the lands to operation of some or all of the public land laws. The new planning document would be completed before the Secretary of the Interior issues an opening order or before the date on which the lands are set to open under an order.

Thus, the status quo–the existing situation–would remain in place on the relinquished parcels until a new planning document is prepared. The new planning document, developed with public involvement and analyzed under NEPA, would adopt new land use prescriptions addressing the resource management

before that time. BLM would continue to cooperate with the Air Force in assuring that Area 1 and Sentinel Plain continue to provide access and encroachment control, as at present.

During the planning process BLM would do the following:

- Consider Area 1 for inclusion in the BLM's National Landscape Conservation System by considering it for special management area designation, perhaps in conjunction with other nearby BLM-administered public lands, and providing recommendations to the Secretary. Area 1, along with more than 400,000 acres of adjacent BLM-administered public land, provides cultural and historical resources and a biological ecosystem that is deserving of National Monument or National Conservation Area status. The BLM would make recommendations to the Secretary on the best methods to protect the area.

- Coordinate with the Barry M. Goldwater Executive Council (BEC) to assure compatibility of the new plan with the Goldwater Range's Integrated Natural Resource Management Plan.

- Use existing BLM plans and draft plans as a starting point. The new plan would consider for adoption decisions and proposals that still apply and are suitable.

- Pursue protection of Area 1 and Sentinel Plain from livestock grazing, any form of mineral entry or development, and land disposal and major rights-of-way.

- Complete an inventory and study of wilderness suitability on Area 1 and Sentinel Plain and forward the findings to the Secretary of the Interior.

- Assure continued access for cultural, religious, and other purposes to all Native American tribes and groups who have or may have affinity with past land users.

- Address recreational use of the lands, including transportation planning, off-highway vehicle use, and road/trail designation. The continued recreational use of Area 1 and potential recreational use of Sentinel Plain, as described in this document, would likely be the basis for the proposed action.

- Address off-road vehicle use and vehicle route (road) management.

- Assure that the Arizona Game and Fish Department continues to have jurisdiction over wildlife and its management. The new land use plan would include the continuation of the present cooperative relationship between BLM and AGFD in wildlife habitat management.

- Address continued access and encroachment control measures as they pertain to Area 1 and Sentinel Plain, in cooperation with the Air Force. This process would include an assessment of the continuation of the present, widely accepted, access permitting process on Area 1 and its possible expansion to Sentinel Plain.

- Address continued military access to the Goldwater Range on the federal parcels along Interstate 8's south frontage road.

- Address permitting of and support for scientific research as an ongoing land use.

- Coordinate with The Nature Conservancy to assure that the new plan adequately addresses protection of biodiversity in the Area 1 part of Conservation Site 32, as described in The Nature Conservancy's Sonoran Desert Ecoregion Analysis.

- Address continued access to or across relinquished lands to the Bender and Childs families.

- Assess the Ajo Airport and Interstate 8 parcels for suitability for disposal.

BLM's management would be aimed at achieving all the "appropriate management and protection" provisions discussed under the section of this document by that name. The land use planning process would be the main management tool for the BLM.

BLM management of the lands, as validated through future land use planning, would:

- Maintain the prohibition on livestock grazing.
- Maintain the prohibition on mineral exploration and mining.
- Maintain the prohibition on major rights-of-way.
- Assure that all Native American tribes and groups have the access they need to fulfill their traditional, cultural or religious needs. In addition, to further assure that Native American needs with regard to these parcels are met, there is precedent for entering in to cooperative resource management relationships between federal land management agencies and tribal groups, and BLM would investigate the suitability of entering into similar cooperative resource management relationships on these lands.
- Assure that the Bender and Childs families have the access or the ability to acquire the access they need in Area 1 or the Ajo Airport parcels, respectively.
- Provide for continued recreational access, with proper limitations and permitting, to meet the Air Force need for access and encroachment control near active ranges. Vehicular use would be allowed, though likely limited to designated roads. Off-highway vehicles would be allowed, as would hunting, camping, rockhunting, backpacking, and other forms of recreation.
- Assure that the Arizona Game and Fish Department can continue to fulfill its wildlife management responsibilities as the jurisdictional agency for Arizona's wildlife. BLM would continue to cooperate with AGFD and nongovernment groups in managing wildlife habitat on public lands.
- Determine the suitability of Area 1 and Sentinel Plain for designation as wilderness.
- Provide for access to the parcels for scientific research.
- Assure consideration of Area 1 and Sentinel Plain for inclusion in BLM's National Landscape Conservation System through special designation, which could include wilderness, national conservation area, monument, or other status.
- Assure protection of biodiversity in a significant part of The Nature Conservancy's Conservation Site 32, thus helping to preserve the biodiversity of the Sonoran Desert.
- Assess whether the Ajo Airport and Interstate 8 parcels are suitable for disposal in whole or in part or should be retained for the public good.

Tohono O'odham Nation

The Tohono O'odham Nation is on record as desiring to have the four parcels that will be relinquished from the Goldwater Range transferred to its ownership. The Nation's Legislative Council has passed resolutions for this request (see Attachment 1), and the Nation's comments on the Barry M. Goldwater Renewal LEIS (USAF 1999) also document this desire. These comments reveal the Nation's opposition to the renewal of the withdrawal for the Goldwater Range and, if not renewed, eventual transfer of the Goldwater Range lands to the Tohono O'odham Nation. In addition, the Nation's comment letter states that, should the Range be renewed, the Nation desires to have any lands relinquished by the Air Force transferred to the Nation. The

comment letter addresses all the parcels except the Interstate 8 parcels, which came under consideration for relinquishment after the final LEIS was published. However, the Nation has requested these lands through a later resolution passed by the Legislative Council.

The Military Lands Withdrawal Act of 1999 requires BLM to work with "the affected tribes" in carrying out this study. Representatives of the Nation have said that the Tohono O'odham consider themselves "the affected tribe" with regard to the study. A representative of the Nation has stated publicly that the Nation was responsible for getting the study language inserted into the Military Lands Withdrawal Act of 1999.

In December 1999, the Nation contracted with the University of Arizona's Bureau of Applied Research in Anthropology to produce a report to support the Nation's desire for the return of their traditional lands to their control (Attachment 1). The document is intended to show the capacity of the Nation to assume further responsibility for portions of their traditional lands and to be an "arms length" study prepared by academic third parties who have no direct stake in the current land management efforts of the Nation. The document (University of Arizona 2000) was produced and provided to BLM, which has used it in completing this study. Much of this section is taken directly from or summarized from the Nation's report.

The report provided to BLM, entitled *Sic Has Elid g Jewed "Respect the Land" A Statement of Natural and Cultural Resources Management Capability,* is intended to be a "management capability statement" documenting the Tohono O'odham Nation's administrative and logistical ability to implement land management strategies and to enforce management laws and regulations. This "management capability statement" should be considered a living document that will be modified and expanded as the Nation's programs expand their responsibilities and capabilities.

The following, taken directly from or summarized from the Nation's report, attempts to describe the environmental management philosophy of the Tohono O'odham people. For a complete review and better understanding of this philosophy and its development, read the entire document (Attachment 1).

When the Tohono O'odham describe natural resource conservation, they discuss not only the management of resources but they also stress harmonious relationships between resources and people, a phenomenon so complex as to be reflected in their language. The management and care of resources include taking care of people, living and deceased, according to the teachings of I'itoi, the creator of people and earth. The O'odham way of managing resources includes both consumptive and nonconsumptive uses that are expressed in written management plans and embedded in the cultural experiences and physical environments of the Tohono O'odham.

The Tohono O'odham society was created over thousands of years of constant adaptations to the changing opportunities and constraints of the Sonoran Desert. Where needed, the O'odham people altered the land to make it better for themselves and to protect it from environmental deterioration through erosion. For example, ak-chin horticulture is a type of specialized agriculture that reduces erosion by diverting rapid runoff from rain storms. The climatic fluctuations of the desert between wet and dry seasons required most O'odham to shift their residency to maximize their uses of the desert resources.

Mining, cattle ranching, irrigated farming, urban growth, and industrial development occur at varying paces and intensities within the Tohono O'odham reservation. Pursuant to the mandate of the Tohono O'odham Nation's constitution and environmental policies, several programs were created to protect and manage the Nation's land and resources. These programs include the Natural Resources Department Program, the Cultural Affairs Program, the Hia-Ced O'odham Program, the Planning and Environmental Program, and the Public Safety Department's Ranger Program, which is within the Law Enforcement Department. For a description of these programs, see Attachment 1.

The development of these programs by the Tohono O'odham Nation shows a commitment to and increasing capability for managing uses that can and do have impacts on cultural and natural resources and the environment. Most of these programs appear designed to deal with or even promote consumptive uses, though in a manner friendlier to the environment than would likely occur without the programs, rather than

preservation or maintenance of the existing resource situation as called for in the “Appropriate Management and Protection” section in this document.

A tribal conservation plan and other conservation planning documents are being prepared to help assess the Nation’s development needs, current ecological and economic pressures, and traditional use strategies. The Nation’s land use planning process is not subject to general public involvement or to National Environmental Policy Act analysis.

The following addresses management of all the relinquished parcels under the ownership of the Tohono O’odham Nation. The discussion must necessarily be based on some level of speculation since the Nation does not have a specific plan in place for the lands. Thus, the discussion considers the Nation’s report as prepared and submitted to BLM and the uses on the Nation’s present land base.

Management of the relinquished parcels under Tohono O’odham Nation ownership would be aimed at achieving the goals and objectives of the Nation, not at meeting the management and protection methods for the parcels as outlined in this document. For instance, the lands would likely become one or more other districts within the reservation. At least part of the lands in these new districts would eventually be put to economic use by members of the Nation. Much if not all of the Tohono O’odham Nation’s reservation is grazed by livestock, and livestock grazing is likely to be introduced to the relinquished parcels. Other forms of economic use or development are also likely occur, such as mineral exploration, followed by mining of any discovered minerals.

These uses, in turn, would inevitably lead to human occupation of the land (likely even without economic use), with accompanying housing and infrastructure development. These factors, and all that goes with them, would lead to significant changes in the land, in the resources on the land, and in the use of the land and resources by others. While the Nation has programs in place to address these changes and their impacts, change would occur in the above-listed management and protection measures.

Tohono O’odham Nation management of the relinquished lands may do the following:

- Likely result in introducing livestock grazing.
- Likely result in introducing mining and mineral exploration.
- Likely result in allowing major rights-of-way.
- Not assure that all Native American tribes and groups have the access they need to fulfill their traditional, cultural, or religious needs. The Bender and Childs families may not have the access or be able to acquire the access they need in Area 1 or the Ajo Airport parcels, respectively.
- Not provide for continued recreational access. Any use of the four parcels by nontribal people would likely be severely curtailed or end altogether.
- Not provide for access and encroachment control for the adjacent Goldwater Range lands and would likely result in increased conflict between the U.S. Air Force and the Nation.
- Would terminate the jurisdiction of the Arizona Game and Fish Department over management of wildlife on the parcels. The AGFD would have no authority to manage wildlife or to assist in wildlife habitat management on the parcels.
- Not result in a wilderness suitability determination of Area 1 and Sentinel Plain.
- Likely not provide for access to the parcels for scientific research.
- Not assure protection of biodiversity in a significant part of The Nature Conservancy’s Conservation Site

32.

- Not assess whether the Ajo Airport parcel could be made available for economic development.

Generally, ownership and resulting use of the relinquished lands by the Tohono O'odham Nation would alter the lands. Any introduction of economic uses such as grazing or mining or simple human occupation would cause major environmental changes, even with the Nation's programs to mitigate those changes. The infrastructure needed to support this future use would cause impacts that are now nonexistent on the lands. Nontribal people of the region would lose a significant recreational resource, since it is unlikely that they would be allowed their accustomed access to the land for that purpose.

Additionally, there would be adverse impacts to the U.S. Air Force. The Tohono O'odham Nation does not support the mission of the Air Force on the Goldwater Range and in fact opposes Air Force use of the Range as clearly stated in their comments on the LEIS (USAF 1999). Existing conflicts over that use and the use of the airspace over the Nation's reservation would be aggravated, since Tohono O'odham lands would lie to the north, east, and south, of Manned Range 3 and East TAC and its training facilities, and to the north of Manned Range 4. Tohono O'odham management would compromise the Air Force's ability to use Manned Ranges 3 and 4, East TAC, and other training facilities on the Range and near the parcels.

National Park Service

Many members of the public who commented on the present study suggested that an option for Area 1 is that it be made a part of the National Park System. The following discussion addresses management of both Area 1 and Sentinel Plain by the National Park Service, since both areas have significant resources. The Ajo Airport and Interstate 8 parcels would not be expected to be transferred to the Park Service since they do not fit the Park Service mission. BLM would manage these areas as described above.

Additions to the National Park System are generally made through acts of Congress, and national parks can be created only through such acts. The President does have authority under the Antiquities Act of 1906 to proclaim national monuments on lands already under federal jurisdiction, as are Area 1 and Sentinel Plain.

The National Park System has a variety of designations. Four are possible for Area 1 and Sentinel Plain: national recreation area, national preserve, national monument, and national park. Recreation areas are managed to preserve resources yet provide for recreation for many people. National preserves have preservation as a mandate but can allow a wide range of uses, including hunting, mining, and recreation. National monuments preserve specific features. National parks preserve lands and resources and prohibit extractive uses. These designated areas are managed to fulfill the Park Service mission, which is: "...to promote and regulate the use of the ... national parks ... which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The following analysis of National Park Service management of Area 1 and Sentinel Plain is general and based on how Park Service units are generally managed. Any congressional act or Presidential proclamation establishing a park, monument, preserve, or recreation area or addition thereto would have specific directives on management of the lands. Park Service land use planning would also affect specific management prescriptions. The type of unit established would have bearing on what uses are allowed or prohibited. The following, as stated above, must therefore deal in generalities. The Park Service's planning process is carried out with public involvement and is subject to NEPA analysis. Some assumptions are made: an act or proclamation would prohibit livestock grazing, mining and mineral entry, and major rights-of-way, and a wilderness suitability study would be carried out.

National Park Service management of Area 1 and Sentinel Plain would provide for the following:

- Continued prohibition of livestock grazing.
- Continued prohibition of mining and mineral exploration.
- Continued prohibition of major rights-of-way.
- Assurance that all Native American tribes and groups have needed access to fulfill traditional, cultural or religious needs. The Bender family may or may not get the access they need in Area 1.
- Continued recreational access, likely with appropriate limitations and permitting to meet the Air Force need for access and encroachment control near active ranges. Vehicular use would be allowed, but limited to designated roads only, with few roads designated. Off-highway vehicles would likely be prohibited. Some forms of recreation now allowed, such as hunting, rock hounding, camping and backpacking would be more regulated or limited than at present.
- An end to Arizona Game and Fish Department's ability to exercise its jurisdiction over wildlife.
- A wilderness suitability study of Area 1 and the Sentinel Plain for possible designation as wilderness.
- Access to the parcels for scientific research.
- Assurance of protection of biodiversity in a significant part of The Nature Conservancy's Conservation Site 32, thus helping to preserve the biodiversity of the Sonoran Desert.

Generally, National Park Service management of the lands would protect resources. Such management would likely decrease the recreational freedom now present on the lands–the ability of the public to use the lands as they do at present. The Air Force's need for access and encroachment control would likely be met. Native American concerns for access would be met, though they may not have adequate vehicular access to sites of importance. The access concerns of the Bender family may not be met because they might not have access to sites of significance to them. The Arizona Game and Fish Department would lose its ability to manage wildlife on the lands.

U.S. Fish and Wildlife Service

Many members of the public who commented on the present study suggested that Area 1 be made a part of the National Wildlife Refuge System. The following discussion addresses management of both Area 1 and Sentinel Plain by the Fish and Wildlife Service, since both areas have significant resources. The Ajo Airport and Interstate 8 parcels would not be expected to be transferred to the Fish and Wildlife Service since they do not fit the Service's mission. BLM would manage these areas as described above.

Additions to the National Wildlife Refuge System, or to existing refuges, are generally made through an internal Fish and Wildlife administrative process, though Congress may also create new refuges or make additions to existing ones.

National Wildlife Refuges are managed to fulfill the mission of the Refuge System and the individual refuge purposes. The fundamental mission of the Refuge System is wildlife conservation. The mission of the Refuge System is: "To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States, for the benefit of present and future generations of Americans."

The following analysis of Fish and Wildlife Service management of Area 1 and Sentinel Plain is general and based on how Refuge System units are generally managed. Any congressional act establishing or adding to a refuge would spell out the purpose for which the refuge is established and would have specific directives on land management. Fish and Wildlife Service land use planning would also affect specific

management prescriptions. By law, refuges are open to recreation activities determined to be compatible with the purposes of the refuge. The Service carries out its planning process with public involvement, and the process is subject to NEPA analysis. This discussion assumes that the Fish and Wildlife Service would prohibit livestock grazing, mining and mineral entry, and major rights-of-way, and that the Fish and Wildlife Service would study the parcels for wilderness suitability.

The Fish and Wildlife Service's management of Area 1 and Sentinel Plain would include the following:

- Continued prohibition of livestock grazing.
- Continued prohibition of mining and mineral exploration.
- Continued prohibition of major rights-of-way.
- Assurance that all Native American tribes and groups have needed access to fulfill traditional, cultural, or religious needs. The Bender family may or may not get the access they need in Area 1.
- Continued recreational access, very likely with suitable limitations and permitting to meet the Air Force need for access and encroachment control near active ranges. The types and extent of recreation allowed would depend on the results of compatibility studies. Vehicular access would still be allowed, although significant curtailment is likely. Such activities as hunting, rockhounding, camping, and backpacking could be subject to limitations.
- Limitation of Arizona Game and Fish Department's ability to exercise its jurisdiction over wildlife.
- A wilderness suitability study of Area 1 and Sentinel Plain for possible designation as wilderness.
- Access to the parcels for scientific research.
- Assurance of protection of a significant part of The Nature Conservancy's Conservation Site 32, thus helping to preserve the biodiversity of the Sonoran Desert.

Generally, Fish and Wildlife Service management of the lands would protect resources but would likely decrease the recreational freedom now present on the lands–the ability of the public to use the lands as it now does. The Air Force's need for access and encroachment control would likely be met. Native American concerns for access would be met, though Native Americans may not have adequate vehicular access to sites of importance. The access needs of the Bender family may not be met because they might not have access to sites of significance to them. The Arizona Game and Fish Department's ability to manage wildlife on the lands would be lessened.

Arizona Game and Fish Department

The following discussion addresses management of both Area 1 and Sentinel Plain by the Arizona Game and Fish Department. The Ajo Airport and Interstate 8 parcels would not be expected to be transferred to the AGFD since they are small and do not lend themselves to intensive wildlife management. BLM would manage these areas as described above.

The Department's mission is "to conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations."

Transfer of the Area 1 and Sentinel Peak parcels to AGFD could occur through an act of Congress or

through the Recreation and Public Purposes Act. Transfer under the Recreation and Public Purposes Act requires the lands be developed to some extent. The Department has a number of land parcels, called Wildlife Areas, under its management, some managed in cooperation with other agencies, some owned outright by the Department. They are managed for the benefit of wildlife or fisheries, with specific rules and regulations developed for each area.

The following analysis of AGFD management of Area 1 and Sentinel Plain is general and based on how Wildlife Areas are generally managed. Any congressional act transferring the lands to AGFD could have specific directives on management of the lands. Departmental land use planning would also affect specific management prescriptions. The following, therefore, is somewhat speculative and must deal in generalities. The Department's planning process is carried out with public involvement and, if Federal funding is involved, is subject to NEPA analysis.

Arizona Game and Fish Department management of Area 1 and Sentinel Plain would provide for the following:

- Continued prohibition of livestock grazing.
- Continued prohibition of mining and mineral exploration.
- Likely prohibition of major rights-of-way.
- Native American tribes and groups would likely have needed access to fulfill traditional, cultural or religious needs. The Bender family may or may not get the access they need in Area 1.
- Continued recreational access, very likely with appropriate limitations and permitting to meet the Air Force need for access and encroachment control near active ranges. Vehicular use, including off-highway vehicles, would be allowed, but likely limited to designated roads only. Some forms of recreation now allowed, such camping, would be more regulated or limited than at present.
- Continuation of Arizona Game and Fish Department's jurisdiction over wildlife.
- No wilderness suitability study of Area 1 and the Sentinel Plain.
- Access to the parcels for scientific research.
- Assurance of protection of biodiversity in a significant part of The Nature Conservancy's Conservation Site 32, thus helping to preserve the biodiversity of the Sonoran Desert.

Generally, AGFD management of the lands would protect resources. Such management could decrease the recreational freedom now present on the lands–the ability of the public to use the lands as they do at present. The Air Force's need for access and encroachment control would likely be met. Native American concerns for access would likely be met.

Ajo Airport Parcel

The Western Pima County Community Council and the Ajo District Chamber of Commerce are on record as requesting that the Ajo Airport parcel be transferred to a suitable entity for use by the citizens of Ajo. They requested that Pima County serve as this entity, but Pima County has declined to do so. Since Ajo is an unincorporated community, it lacks the governmental status to hold the land in common. The above groups are searching for an entity to hold the land. They have also contacted their congressional delegation on their desire for the land.

Several possible uses for the land by Ajo have been informally suggested. These include airport facility

expansion, commercial development such as hotels or resorts, industrial development such as factories or warehouses, parks or housing, and sand and gravel production from Tenmile Wash.

If the lands were transferred to some as yet to be identified entity as a direct result of this study, any of the above uses, or others, could occur. Unless deed restrictions are placed on the land, only Pima County zoning would limit the use of the land.

If BLM retains management of the land, it would assess in its land use planning process the suitability of disposing of all or part of the parcel. If disposal by exchange or by direct sale is appropriate, BLM would dispose of the land at equivalent value for exchange or fair market value for sale. In addition, use of the land and title might be eventually transferred under the Recreation and Public Purposes Act, at less than fair market value, if a suitable entity could be found to apply for and hold the land. In any event, provision should be made for the Childs family to have access across the parcel to its private land. Access could be allowed through a variety of means, but the simplest is BLM's granting of an easement or right-of-way before transferring title to the land.

AGENCY, TRIBAL, AND PUBLIC INVOLVEMENT

In carrying out this study, BLM was required under the Military Lands Withdrawal Act of 1999 (P.L. 106-65) to work with affected tribes and state and federal agencies knowledgeable of the lands and resources considered in the study and the laws affecting them. The wording of the Military Lands Withdrawal Act of 1999, Section 3031(7), that requires tribal and agency involvement is as follows:

> (B) In carrying out the study required by subparagraph (A), the Secretary of the Interior shall work with the affected tribes and other Federal and State agencies having experience and knowledge of the matters covered by the study, including all applicable laws relating to the management of the resources referred to in subparagraph (A) on the lands referred to in that subparagraph.

To begin the process of tribal and agency involvement, BLM held a workshop and invited state and federal agencies that fit the description referred to in the law. BLM also invited the Four Southern Tribes, the tribes most likely to be directly affected.

Invitees that attended were the Tohono O'odham Nation, Gila River Indian Community, Salt River-Pima Indian Community, Ak-Chin Indian Community, Office of Senator John McCain, U.S. Air Force, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, Arizona Department of Mines and Mineral Resources, and Arizona Department of Agriculture. After the workshop, all invitees, whether attending or not, received a followup letter informing them they could continue to provide information on the lands to be relinquished. Several did so.

Believing that public involvement was also needed and warranted in the study process, BLM sought public input. BLM and the U.S. Air Force then held a series of five public open houses to allow the general public to receive information, have their questions answered, and provide information and ideas to BLM on the resources and future management of the lands to be relinquished. The open houses were held in Yuma, Gila Bend, Ajo, Tucson and Sells, all in Arizona. Letters were sent to 123 parties known to be interested in the Goldwater Range and the lands to be relinquished. These included those invited to the workshop and Native American tribes and groups.

In addition, press releases announcing the open houses were sent to media outlets in all the above towns and other Arizona towns and cities. The local newspapers printed the press release in all five of the host towns, and a Yuma local radio station announced the open houses. The major statewide newspaper, the *Arizona Republic*, printed the dates, times, and places for the open houses. Additionally, in Ajo and Gila Bend, notices were placed in suitable locations for the public to read.

Open house attendees were given a briefing on the lands and the study process, and their questions were addressed. Each was asked to take a BLM-provided form that had the return name and mailing address on which to provide written comments. A total of 89 people signed in at the open houses; 26 returned forms with resource information or suggestions on management. A nearly universal consensus of participants in most of the open houses was that Area 1 should remain open to public recreation. These participants felt that it was of high importance that they continue to have access to recreation opportunities in Area 1. They did not object to the permit requirement. In fact, many supported permits as a way to protect Area 1's resources and land.

Another letter was sent to all Native American tribes and groups known to be interested in the Goldwater Range, other than the Four Southern Tribes, who had participated in the tribal/agency workshop. The letter invited Native Americans to provide any information they wished to share on their concerns and needs regarding the lands to be relinquished. Several provided information or ideas or sought clarification.

BLM received many letters and e-mails on the project. Fifteen nongovernmental organizations sent information and ideas in letters. One nongovernmental organization contracted for preparation of a report on resources and recommendations on Area 1 and Sentinel Plain and provided it to BLM for consideration in

preparing this study (SWNRMC 2000). An additional 72 letters were received from the general public, most supporting conservation management but a few suggesting that consumptive use be resumed. More than 400 e-mails were received, most generated through an automated “send your comments” process on a major environmental group’s Internet web site. Few of these contained resource information, but most did have suggestions on future management and a request for wilderness inventories as part of the study. Other e-mails opposed wilderness study but supported continued recreation use.

The vast majority of communications from the public supported the following:

- Keeping management of the lands within the Federal Government.
- Continuing recreational use in some form.
- Opposing any effort to allow livestock grazing or mining and mineral exploration.
- Wilderness studies and inventory, though there was some opposition to any consideration of wilderness.

LITERATURE CITED

ADMMR. 2000. Letter from Arizona Department of Mines and Mineral Resources to Phoenix Field Office of BLM, May 25. 1 page plus enclosures.

Anderson, John. 2000. Personal communication between John Anderson, Botanist, Bureau of Land Management, Arizona State Office and Eugene A. Dahlem, Resource Advisor, Bureau of Land Management, Phoenix Field Office and. August 1.

ARCADIS, Geraghty & Miller. 1998a. Water resource assessment for the Barry M. Goldwater Range including the Cabeza Prieta National Wildlife Refuge and Gila Bend Auxiliary Field. Report prepared for the Bureau of Land Management and U.S. Air Force, Luke Air Force Base, Arizona.

ARCADIS, Geraghty & Miller. 1998b. Mineral Potential Report, Barry M. Goldwater Range, Arizona, Land Withdrawal. Report prepared for the Bureau of Land Management and U.S. Air Force, Luke Air Force Base, Arizona.

Barnes, Will C. 1988. Arizona place names. University of Arizona Press. Tucson.

Bayman, James M. 1992. Archaeological sample survey on the Barry M. Goldwater Air Force Range. Center for Desert Archaeology Technical Report No. 92-9. 41 pp.

Bibles, Brent and L. K. Harris. 1999. Neotropical migratory bird monitoring program Barry M. Goldwater Air Force Range, Arizona. Prepared by Harris Environmental Group, Inc. for the U. S. Air Force, Luke Air Force Base, Arizona. 58 pp.

BLM. 1990. Lower Gila South Resource Management Plan/EIS-Goldwater Amendment. Prepared by the Lower Gila Resource Area, Phoenix District. 145 pp. plus appendices.

Dalton, Virginia M., and D. C. Dalton. 1994. Mine/bat survey: eastern and western sections Barry M. Goldwater Air Force Range. Contract No. DACA65-92-M-1138. Prepared for U. S. Air Force, Luke Air Force Base, Arizona. 113 pp.

Dalton, Virginia M., and D. C. Dalton. 1999. Bat roost survey of the eastern section of the Barry M. Goldwater Air Force Range. Contract Nos. F02604-97-MS179 and F02604-98-MV003. Prepared for U.S. Air Force, Luke Air Force Base, Arizona. 26 pp.

Dalton, Virginia M., D. C. Dalton, and S. L. Schmidt. 1994. Roosting and foraging use of a proposed military training site by the long-nosed bat, *Leptonycteris curasoae*. Contract No. DACA65-94-M-0831l, DACA65-94-M-0753. Luke Air Force Base, Arizona. 34 pp.

Dames and Moore. 1994. Neotropical migratory bird monitoring program, Barry M. Goldwater Air Force Range, Arizona. Prepared for the U.S. Air Force, Luke Air Force Base, Arizona. 45 pp.

Dames and Moore. 1998. Cactus ferruginous pygmy-owl survey Barry M. Goldwater Range, Arizona 1996-1998. D&M Job No. 010156-633-050. Prepared for U.S. Air Force, Luke Air Force Base, Arizona. 10 pp. plus maps and appendix.

Dames and Moore. 1999. Small owl monitoring on the Barry M. Goldwater Range. D&M Job No. 01016-690-050. Prepared for U.S. Air Force, Luke Air Force Base, Arizona. 32 pp.

Geraghty and Miller, Inc., and SWCA, Inc. 1997. Acuna cactus survey report on portions of the Barry M. Goldwater Range. Prepared for the U.S. Air Force, Luke Air Force Base, Arizona. 19 pp.

Hervert, John. 2000. Personal communication between John Hervert, Wildlife Biologist for Arizona Game and Fish Department, Region 4, Yuma, and Eugene A. Dahlem, Resource Advisor, Bureau of Land Management, Phoenix Field Office. August 9.

Homburg, Jeffrey A., J. H. Altschul, and R. Vanderpot. 1993. Intermontane settlement trends in the eastern Papagueria: cultural resources sample survey in the northeastern Barry M. Goldwater Range, Maricopa County, Arizona. Prepared for the U.S. Army Corps of Engineers, Los Angeles District, by Statistical Research, Inc., Tucson, Arizona. Technical Series No. 37. 307 pp. plus appendices.

Marshall, R. M. 2000. Letter from Rob Marshall, The Nature Conservancy, Tucson, Arizona, to Gene Dahlem, Bureau of Land Management, Phoenix Field Office. May 30.

Marshall, R. M., S. Anderson, M. Batcher, P. Comer, S. Cornelius, R. Cox, A. Gondor, D. Gori, J. Humke, R. Paredes Aguilar, I. E. Parra, S. Schwartz. 2000. An ecological analysis of conservation priorities in the Sonoran Desert ecoregion. Prepared by The Nature Conservancy Arizona Chapter, Sonoran Institute, and Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora with support from Department of Defense Legacy Program, Agency and Institutional partners. Tucson, Arizona. 146 pp.

Morrison, Michael L., P. C. Hardy, D. J. Griffin. 1996. Sampling for occurrence of small owls on the Barry M. Goldwater Range. Prepared by the School of Renewable Natural Resources, University of Arizona, for the U. S. Air Force, Luke Air Force Base, Arizona. 109 pp. plus maps.

Morrison, Michael L., P. C. Hardy, D. J. Griffin, and A. J. Kuenzi. 1997. Neotropical migratory bird monitoring program Barry M. Goldwater Air Force Range, Arizona. Prepared by the School of Renewable Natural Resources, University of Arizona, for the U. S. Air Force, Luke Air Force Base, Arizona. 166 pp.

Oxford, Richard B., and G. L. Bender. 1973. Proposed natural areas Sentinel Plain Lava Flow. Report No. 37. Prepared by Arizona Academy of Science for Planning Division, Department of Economic Planning and Development, Office of the Governor, State of Arizona, Phoenix, Arizona. 5 pp.

Rankin, Adrianne. 2000a. Personal communication between Adrianne Rankin, Archaeologist, 56 RMO/ESMT, Luke Air Force Base, Arizona and Eugene A. Dahlem, Resource Advisor, Bureau of Land Management, Phoenix Field Office. July 29.

Rankin, Adrianne. 2000b. Personal communication between Adrianne Rankin, Archaeologist, 56 RMO/ESMT, Luke Air Force Base, Arizona and Eugene A. Dahlem, Resource Advisor, Bureau of Land Management, Phoenix Field Office. August 7.

Spaulding, Geoffrey W. 1996. The initial study of a glacial-age packrat midden from the Barry M. Goldwater Air Force Range. Dames and Moore, Phoenix, Arizona. Prepared for the U.S. Air Force, Luke Air Force Base, Arizona. D&M Job No. 01016-583-050. 18 pp.

SWNRMC. 2000. An assessment of the desirability to change the future management of natural resources in “Areas 1" and “9" located in the Sand Tank Mountains and Sentinel Plain, Maricopa County, Arizona. Prepared for Friends of Cabeza Prieta by Southwest Natural Resources Management Consultants. Mesa, Arizona. 17 pp. plus appendices.

University of Arizona. 1986. Natural Resources Management Plan for Luke Air Force Range. Prepared for the U.S. Air Force - Tactical Air Command. Luke Air Force Base, Arizona.

University of Arizona. 2000. Sic Has Elid g Jewed “Respect the Land” A statement of natural and cultural resources management capability. Prepared for the Tohono O’odham Nation, Sells, Arizona, by the Bureau of Applied Research in Anthropology, University of Arizona, Tucson. 69 pp. plus appendices.

USAF. 1999. Renewal of the Barry M. Goldwater Range Land Withdrawal. Final Legislative Environmental Impact Statement. Volume 1. U.S. Air Force, Luke Air Force Base, Arizona.

USAF. 2000. Letter from U.S. Air Force, Luke Air Force Base, to Bureau of Land Management, Phoenix Field Office. June 28. 2 pp.

APPENDIX 1 - COMMON AND SCIENTIFIC PLANT AND ANIMAL NAMES

The following is a list of the common and scientific names of plant and animal species used in this document. It is by no means a complete listing of species present on the study parcels, which would be many pages long. A more complete list of species found on the BMGR can be found in Appendix E of the U.S. Air Force' Legislative Environmental Impact Statement on the BMGR (USAF 1999).

Plant Species

Acuna cactus	*Echinomastus erectocentrus acunensis*
Arizona rosewood	*Vauquelinia californica sonorensis*
Big galleta	*Hilaria rigida*
Bitter condalia	*Condalia globosa*
Bursage	*Ambrosia sp.*
Cholla	*Opuntia sp.*
Chuperosa	*Beloperone californica*
Creosotebush	*Larea tridentata*
Desert honeysuckle	*Anisacanthus thurberi*
Desert willow	*Chilopsis linearis*
Elephant tree	*Bursera microphylla*
Foothill paloverde	*Cercidium microphyllum*
Ironwood	*Olneya tesota*
Juniper	*Juniperus coahuilensis*
Kofa barberry	*Berberis harrisoniana*
Mesquite	*Prosopsis sp.*
Mexican jumping bean	*Sebastiana biloculare*
Organ pipe cactus	*Stenocereus thurberi*
Saguaro cactus	*Cereus giganteus*
Sand food	*Pholisma sonorae*
Schott's wire lettuce	*Stephanomeria schottii*
Smoke tree	*Psorothamnus spinosa*
Triangle-leaf bursage	*Ambrosia deltoidea*
Naked seed	*Gymnosperma glutinosa*
Three-awn grasses	*Aristida sp*.
Gramma grasses	*Bouteloua sp.*
Muhlenbergia grasses	*Muhlenbergia sp.*

Animal Species

Birds

Barn owl	*Tyto alba*
Black-throated sparrow	*Amphispiza bilineata*
Cactus ferruginous pygmy owl	*Glaucidium brasilianum cactorum*
Elf owl	*Micrathene whitneyi*
Great horned owl	*Bubo virginianus*
Harris hawk	*Parabuteo unicinctus*
Le Conte's thrasher	*Toxostoma lecontei*
Lesser nighthawk	*Chordeiles acutipennis*
Peregrine falcon	*Falco peregrinus anatum*
Red-tailed hawk	*Buteo jamaicensis*
Western screech owl	*Otus kennicottii*

Mammals

Bobcat	*Lynx rufus*
Cave myotis	*Myotis velifer velifer*
Collared peccary (javelina)	*Tayassu tajacu*
Coues white-tailed deer	*Odocoileus virginianus couesi*
Coyote	*Canis latrans*
Desert bighorn sheep	*Ovis canadensis mexicana*
Gray fox	*Urocyon cinereoargenteus*
Jackrabbit	*Lepus sp.*
Leaf-nosed bat	*Macrotus californicus*
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*
Mountain lion	*Felis concolor*
Mule deer	*Odocoileus hemionus*
Sonoran pronghorn	*Antilocapra americana sonoriensis*
Cottontail rabbit	*Sylvilagus auduboni*

Reptiles

Black-tailed rattlesnake	*Crotalus molossus*
Colorado Desert fringed-toed lizard	*Uma notata*
Desert tortoise	*Gopherus agassizii*
Mexican rosy boa	*Lichanura trivirgata trivirgata*
Mohave rattlesnake	*Crotalus scutulatus*
Red-backed whiptail lizard	*Cnemidophorus tigris*
Sidewinder rattlesnake	*Crotalus cerastes*
Speckled rattlesnake	*Crotalus mitchellii*
Tiger rattlesnake	*Crotalus tigris*
Western chuckwalla	*Sauromalus obesus*
Western diamondback rattlesnake	*Crotalus atrox*

Amphibians

Couch's spadefoot toad	*Scaphiopus couchii*
Red-spotted toad	*Bufo punctatus*
Sonoran Desert toad	*Bufo alvarius*
Sonoran green toad	*Bufo retiformis*

APPENDIX 2 - PHOTOGRAPHS OF RELINQUISHED LANDS

Figure 1. The southern part of Area 1, with the Sand Tank Mountains in the background.

Figure 2. A healthy stand of saguaros, a saguaro forest, in Area 1 with palo verde trees and one ironwood tree intermingled. Javelina Mountain in the background.

Figure 7. Volcanic rocks cover much of the Sentinel Plain.

Figure 8. Desert pavement on Sentinel Plain. Sentinel Peak in the background. Though not visible, Interstate 8 and the Union Pacific Railroad lie just this side of Sentinel Peak.

Figure 11. The Ajo Airport parcel, with typical vegetation and topography. Childs Mountain, in the background, is not on the parcel. The line of trees in the background is Tenmile Wash.

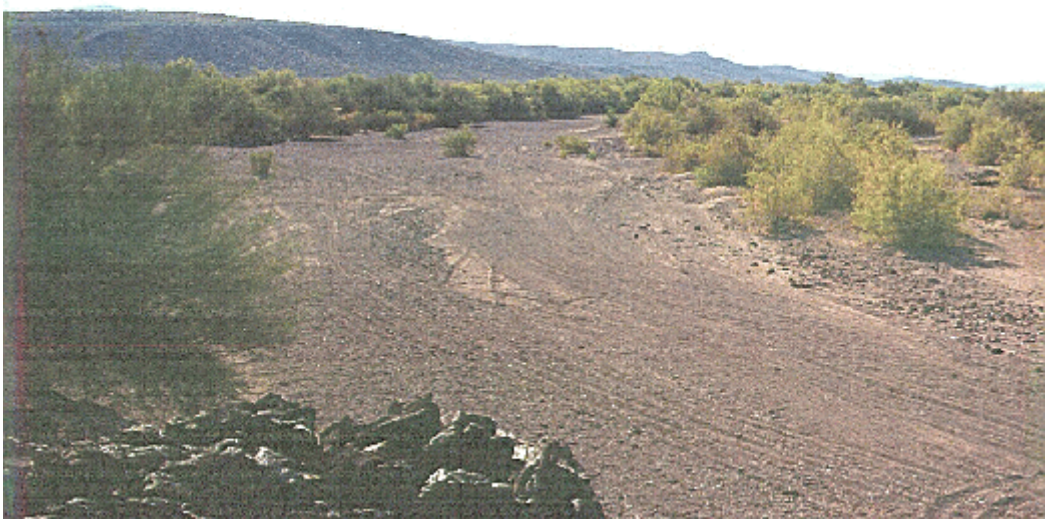


Figure 12. Tenmile Wash on the Ajo Airport parcel. Xero-riparian habitat along the banks, and OHV tracks in the wash bed.

Figure 13. Vegetation and topography on the Interstate 8 parcels, east end.

Figure 14. Sand dune habitat on the west end of Interstate 8 parcels.

Figure 9. Sentinel Plain, showing typical vegetation and topography. The mountains in the background not on the Plain.

Figure 10. Grassy swale, with big galleta grass and palo verde trees, on Sentinel Plain.

Figure 3. The historic smelter at Papago Indian Chief Mine, Area 1.

Figure 4. Rock ruins along the southern edge of Area 1, near Bender Spring in the Sand Tank Mountains.

Figure 5. Saguaro forest, with Javelina Mountain's Maricopa Peak in the left background.

Figure 6. Large saguaros, with Blue Plateau, part of the Sand Tank Mountains, in the background.

Attachment 1

Contents

1. Letter from Edward D. Manuel, Chairman, Tohono O'odham Nation, to Michael A. Taylor, Phoenix Field Manager, Bureau of Land Management, regarding the Study of the Four Parcels to be Relinquished from Barry M. Goldwater Range. August 25, 2000.

2. Resolution 99-182 of the Tohono O'odham Legislative Council, Requesting Restoration by the United States to the Tohono O'odham Nation of Lands Know as the Sand Tank Mountains, the Sentinel Plain, and the Lands Surrounding the Ajo Airport into Trust and Reservation Status, and Resolution 99-337, amending Resolution 99-182 to include an additional land Area in the Tohono O'odham Nation Request for Restoration (without listed attachments).

3. Summary - Tohono O'odham Aboriginal Lands Located on the Barry M. Goldwater Range (Four Parcels to Be Relinquished).

4. Tohono O'odham Nation's Report - *Sic Has Elid g Jewed "Respect the Land"* A statement of natural and cultural resources management capability. Prepared for the Tohono O'odham Nation, Sells, Arizona, by the Bureau of Applied Research in Anthropology, University of Arizona, Tucson. July 3, 2000.