



~~DRAFT~~

MEMORANDUM

Date: August 16, 2000

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

A handwritten signature in dark ink, appearing to be "C.H. Huckelberry", is written over the typed name and title.

Re: Preliminary Mountain Parks Element

I. Background

One year ago we issued a discussion paper entitled *Mountain Parks and the Sonoran Desert Conservation Concept Plan* that described the relation of the current and proposed system of mountain parks and reserves to the ongoing multi-species conservation planning process and the larger Sonoran Desert Conservation Plan. Today the draft *Preliminary Mountain Parks Element* is being forwarded to the Board.

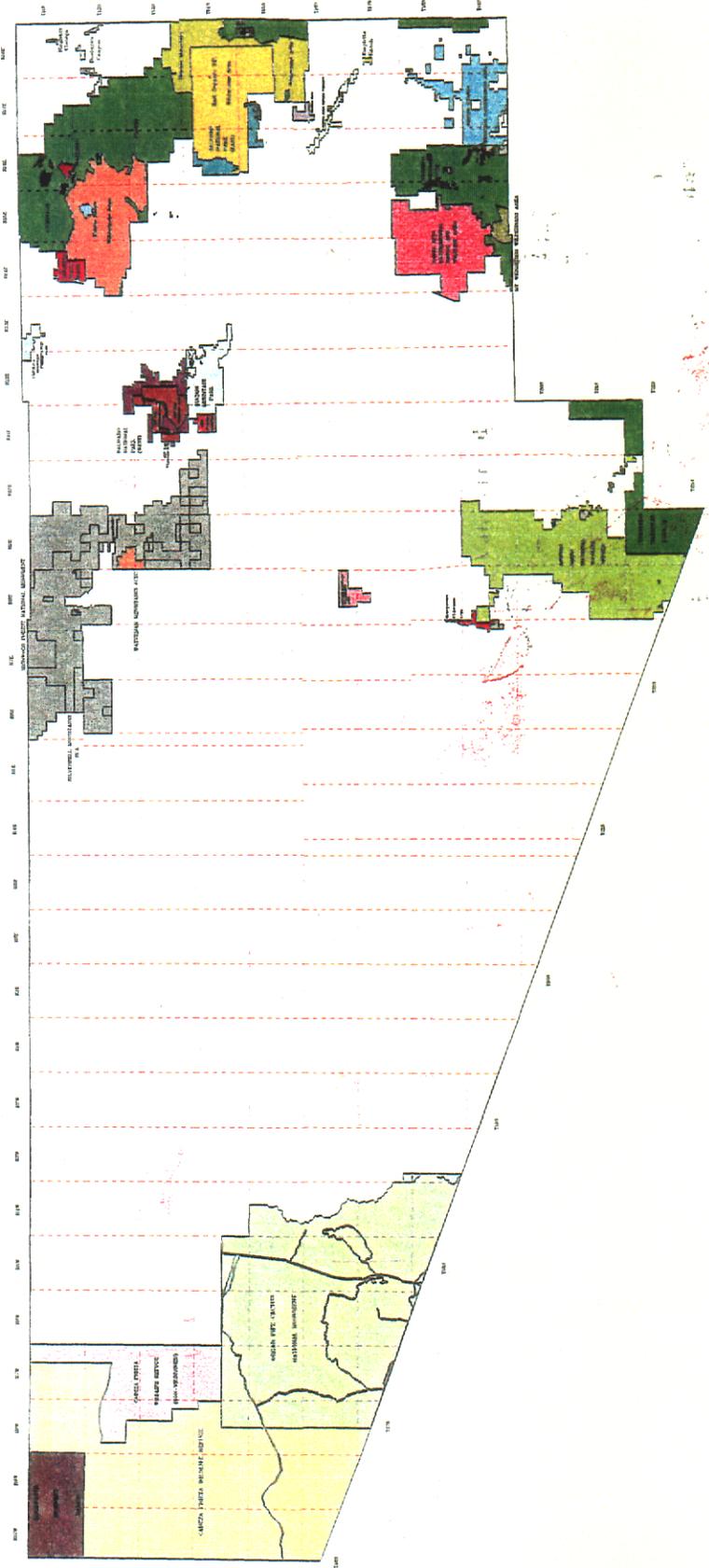
During the past year, community-based initiatives have inspired action at the local and federal level. This has accelerated the planning process and implemented aspects of the Mountain Parks Element. Examples of progressive conservation commitments include the Board of Supervisors significant expansion of Pima County's Tucson Mountain Park by over 1,500 acres, the establishment of the Ironwood National Monument by the President of the United States, and the introduction of legislation by Congressman Jim Kolbe to create the Las Cienegas National Conservation Area.

Conservation activity at this scale has not occurred in Pima County since the early part of the century, when most of the existing major reserves were created between 1902 and 1933. Pima County has, since the creation of Tucson Mountain Park in 1929, established two relatively small parks and a natural preserve. But we now realize, as we find that approximately 50 imperiled species create federal compliance issues and signal a general decline in our natural systems, that our incremental approach to conservation over the last 70 years has not been sufficient, and the activity of the of past year will have to continue in order for Pima County to begin to stabilize our resource systems and strike a balance that ensures our quality of life for many future generations.

We have stated this before, but it is a point that warrants repeating: Our riparian environments have experienced great losses, and these losses relate to wildlife declines. The Science Technical Advisory Team for the Sonoran Desert Conservation Plan has identified over 50 priority vulnerable species for potential coverage under the Sonoran Desert Conservation Plan. Stated simply, regardless of the amount of open space that exists across Pima County, we have not assembled an open space system that effectively preserves and conserves native species.

Figure 2

Existing Reserves



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| <ul style="list-style-type: none"> ARIZONA STATE PARKS BOARD BAROQUE WILDLIFE RESERVE BINGHAM NATIONAL PRESERVE BURNING ARMS NWR BUREAU OF RECLAMATION WILDLIFE MIGRATION CORRIDOR BUTTERFLY RUN CANICA PEBRA WILDLIFE REFUGE NWR CANICA PEBRA WILDLIFE REFUGE WA CARLENA STATE PARK CIBOLA CREEK COVE CIBOLA CREEK NATURAL PRESERVE COLONIAL COVE | <ul style="list-style-type: none"> CORONADO NATIONAL FOREST COSTA MOUNTAIN WA EMPIRE-CIBOLA RICA BARRETTA RANCH GOLDWATER CANNERY RANGE IRONWOOD FOREST NATIONAL MONUMENT MAT WRIGHTSON WA ONCA NATURAL MONUMENT ORIGAN NATIONAL MONUMENT WA PIAWIPIMA COUNTY RECLAMATION PUSSETT RIVER WA IRONSON MOUNTAIN WA SACUANO NATIONAL PARK EAST | <ul style="list-style-type: none"> SACUANO NATIONAL PARK EAST WA SACUANO NATIONAL PARK WEST SACUANO NATIONAL PARK WEST WA SANTA CATALINA MOUNTAIN RIMA SANTA RITA RECREATIONAL RANGE THE NATURAL CONSERVANCY - PELONZUELO THE NATURAL CONSERVANCY BASINS TORTOLETA MOUNTAIN PARK TUCSON MOUNTAIN PARK WALHERMAN MOUNTAINS ACIC |
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There are reasons for the mismatch between past preservation efforts and the reality of our declining natural systems.

- ▶ First, parks in Pima County and across the country have often been created to set aside areas of great beauty, but plant and animal communities do not make location decisions based on aesthetics.
- ▶ Second, areas that have been set aside for wildlife protection purposes often are too small to support a viable population of the species. It was not until 1985 that scientists in the relatively new field of conservation biology could calculate how badly we have misjudged the area needs of wide ranging carnivores. Large animals are becoming extinct within the boundaries of the very parks that were created to protect them.
- ▶ And third, existing protected areas are disconnected. This fragmentation between even large public areas relegates the existing open space patches to the role of a zoo, when the natural functions of the system are replaced by human management and maintenance of the plant and animal communities.

The difficult inheritance of past conservation decision making is that as a rule, federal and local public parks were established without a full understanding of the relationship between open space and species conservation, and, as currently configured, they simply will not support suites of species. This applies to parks on a national scale, and it is true in Pima County too.

Unlike many communities, however, Pima County still has the opportunity to assemble an effective reserve. We are fortunate to have a number of open space areas, often connected by riparian linkages. The County's parks and preserve system is flexible so that a future open space and preserve system involving federal, state, and private land can include County-owned land managed at the level of conservation that is necessary.

This gives the community an opportunity to meet conservation compliance requirements at a regional level, in part through the County's parks and preserve system, while at the same time creating and implementing an adaptive management strategy which can adjust over time to actually improve implementation of the Sonoran Desert Conservation Plan as better scientific information becomes available.

The *Preliminary Mountain Parks Element* suggests where connections exist and it provides a look at the resources within existing and proposed parks and preserves, based on current management and planning documents.

The comprehensive biological assessment conducted as part of the Sonoran Desert Conservation Plan is expected to result in changes to proposed preserve boundaries and preserve management. The *Preliminary Mountain Parks Element* frames open space possibilities by outlining the known potential of one ranch conservation area, parks, and preserve areas in Eastern Pima County.

II. Potential to Protect, Enhance and Create Mountain Parks and Preserves

Since the establishment of Tucson Mountain Park in 1929, Pima County's mountain parks and natural preserves have played an important and diverse role in the life of the community. This role will be expanded with the development of the Sonoran Desert Conservation Plan through the design and implementation of a comprehensive open space parks and reserve system that meets endangered species compliance standards for the region. A potential ranch conservation area, parks and preserves are described below by watershed planning unit, in order to facilitate discussion of the regional reserve network.

1. Middle San Pedro Subarea

The Middle San Pedro watershed subarea covers 174,315 acres. Within that area, the United States Forest Service and United States National Parks Service manage substantial land areas. A small reserve exists in the Bingham Cienega Natural Preserve, and the draft *Preliminary Sonoran Desert Conservation Plan* proposes the following addition.

Buehman-Bingham Natural Preserve -- The proposed 7,489-acre Buehman-Bingham Natural Preserve would assure a permanent link between the Catalina Mountains and the San Pedro River corridor and the protection of the sensitive plant and wildlife resources that presently exist in this area.

Vegetation -- The Buehman Canyon corridor is rich in vegetation, and is home to large stands of a variety of trees, including cottonwood, ash, walnut, willow, mesquite, hackberry, oak, sycamore, and juniper.

Animal species -- Riparian species are particularly abundant, and include such high-value inhabitants as leopard frogs (a species of special concern) and the longfin dace. Over 300 species of birds can be found in the area, two-thirds of which are neotropical migrants. Seldom-seen bird species identified in the area include the western yellow-billed cuckoo, the northern gray hawk, the zone-tailed hawk, and others, including the endangered Southwestern willow flycatcher. Other wildlife known to frequent the area include coatimundi, black bear, whitetail and mule deer, javelina, bobcat, and ring-tailed cats. Part of the San Pedro corridor is within the critical habitat designation for the pygmy-owl.

2. Cienega Rincon Subarea

The Cienega Creek watershed represents one of the most important, if not the most important area in Pima County for aquatic and riparian dependent species. Pima County and the Bureau of Land Management hold sensitive lands, but expansion of current holdings, whether through the proposed Las Cienegas National Conservation Area or achieving additional conservation commitments in the area, are necessary to the success of the Sonoran Desert Conservation Plan. The draft *Preliminary Sonoran Desert Conservation Plan* proposals include additional conservation actions in the Cienega Creek Preserve area, Colossal Cave Mountain Park area, Davidson Canyon, Santa Rita Mountains, and the most sweeping and significant proposal, the Las Cienegas National Conservation Area.

Cienega Creek Natural Preserve --The 3,979-acre Cienega Creek Natural Preserve was Pima County's first Natural Preserve. The Preserve encompasses approximately 12 miles of the Cienega Creek, and roughly half of the protected stretch of the creek experiences perennial stream flow. Important purposes served by keeping this reach of the Cienega Creek in its existing undiminished state are the facilitation of natural aquifer recharge, and the assistance it offers in lessening the severity of flood events capable of impacting the developed area of the Tucson Basin. The utility of the Preserve's flood control capability alone makes it of exceptional value to the Tucson metro area. The lands within the preserve are in excellent natural condition, and few man-made improvements exist within its boundaries. The most significant of the existing improvements is the Vail Water Company diversion, where the perennial base flows of the river are diverted and carried off the preserve via a pipeline. For purposes of planning, the Sonoran Desert Conservation Concept Plan suggests the expansion of the preserve by 7,293 acres, and the protection of Mescal Arroyo which links to Cienega Creek, adding another 1,856 acres to the preserve.

Vegetation - The preserve, which is located within a transitional zone between the Sonoran and Chihuahuan Deserts and thus exhibits some of the features of each region, is home to nine plant associations. These associations include:¹

- Mixed Grass - Mixed Scrub Association (2%)
- Burroweed - Mesquite Association (5%)
- Creosote - Mariola Association (12%)
- Ocotillo - Mixed Scrub Association (1%)
- Creosote Association (9%)
- Creosote - Mixed Scrub Association (14%)
- Velvet Mesquite Association (20%)
- Velvet Mesquite - Mixed Deciduous Tree Association (4%)
- Velvet Mesquite - Mixed Scrub Association (21%)

Two special status plants are known to occur in the area, and the possibility exists that these plants may exist in the preserve and/or on the preserve's adjacent expansion lands identified in the Sonoran Desert Conservation Concept Plan: the Needle-Spined Pineapple Cactus and the Pima Pineapple Cactus. The Pima Pineapple Cactus is a listed endangered species.

Animal species -- Two principal types of wildlife habitat exist within the existing boundary of the preserve and on its surrounding expansion lands -- those associated with the preserve's riparian areas, and those associated with its upland areas. The more significant of the two are the habitats associated with the preserve's riparian areas, because of the high level of biological productivity and species diversity they foster. As a result of its quality, the preserve's wildlife habitat sustains a diverse and large population of mammals, birds, fish, reptiles, amphibians, and invertebrates. Three special status species are known to exist in the preserve: the Lowland leopard frog, the Mexican long-tongued bat, and the Mexican garter snake. Other special status or species of concern may also be present in the preserve: the Gila chub, the Gila topminnow, the Lesser long-nosed bat, and the Sonoran desert tortoise.

¹The remaining 12% of the Preserve not included in one of the plant communities listed above consists of abandoned ag fields (4%) and bedrock/sandy wash channel (8%).

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Recreation potential -- The Cienega Creek Natural Preserve's lush vegetation and scenic values, clean running water, outstanding mountain vistas, and sense of solitude and natural quiet make it a very attractive place to visit. However, because resource protection is the principal imperative in the preserve, recreational activities are limited to those that do not adversely impact its sensitive resources:

- Hiking, walking, backpacking, picnicking and related activities;
- Railroad train watching, photography and painting;
- Non-intrusive bird and wildlife observation, photography and painting;
- Wading in the creek's pools and stream;
- Scientific research and environmental education;
- Other low impact recreational or educational activities.

Access is limited to 50 people per day, and a permit is required to enter the preserve. Presently about 10 people per weekday visit the Cienega Preserve.

Colossal Cave Mountain Park -- At approximately 2,000 acres, Colossal Cave is Pima County's smallest existing mountain park, but it too has the potential to grow considerably to meet the region's conservation goals in the Rincon Valley area. While best known for the tourist attraction from which it draws its name, the park has outstanding scenic resources, and includes the 1870s Posta Quemada Ranch. As might be expected from a park that features a natural cave, the geology of Colossal Cave Mountain Park is extraordinary, and is undoubtedly its most significant characteristic. According to experts who have conducted studies on the site, the park's geology is uncommonly diverse, and represents a "mosaic" array of 20 different geologic units. Honoring a request received during the public comment period, the Sonoran Desert Conservation Concept Plan suggests, for planning purposes, that the park be expanded by 14,160 acres in addition to the 4,814 acres recommended by County staff.

Vegetation - Colossal Cave Mountain Park is also notable for its wide range of vegetative communities. This exceptional diversity can be attributed to its variety of rock and soil types (21 soil types occur within the park's planning area), as well as to the fact that the park is located in a transition area between the Chihuahuan and Sonoran deserts, and includes some of the characteristics of both regions. Six vegetative communities have been identified within the park's planning area, including the Creosote Bush, Palo Verde-Saguaro, Chihuahuan Desertscrub, Semidesert Grassland, Deciduous Riparian Forest, and Evergreen Woodland associations.

Animal species -- Special status wildlife species that are known to occur in the park include the desert tortoise, the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, the California leaf-nosed bat, the western red bat, and Townsend's big-eared bat. The species that inhabit the park range from predatory mammals such as ringtail cats and mountain lions to at least 11 species of bats. The park is especially diverse in bird and reptile species, at least partly owing to the lush riparian habitat in the Posta Quemada Wash and along the nearby Agua Verde Creek.

Cultural resources -- Colossal Cave and the area surrounding it, including the suggested expansion lands, have considerable archeological and historical significance. The lands, with

natural springs and riparian corridors, have long attracted the interest of humans and were inhabited for an extended period. To date, 13 prehistoric sites have been identified in vicinity of the park and the adjacent Pistol Hill area.

Recreation potential -- Colossal Cave Mountain Park presently offers a wide range of passive recreation opportunities, including picnicking, birdwatching, hiking, horseback riding and camping.

Davidson Canyon Natural Preserve -- Davidson Canyon is a broad, deep and impressive natural wash corridor approximately 12 miles long that contains high-quality riparian habitat and is extraordinarily picturesque. The canyon, situated a short distance east of the Sonoita Highway and south of Cienega Creek, connects the Cienega Creek Natural Preserve with the Nogales Ranger District of the Coronado National Forest. The proposed Davidson Canyon Natural Preserve, a 6,191-acre unit, and would encompass the roughly 11 miles or so of the canyon not presently protected by Pima County or any other land management agency. The preserve's significance as a corridor between protected natural areas is difficult to overstate; no other linkage proposed in the Sonoran Desert Conservation Concept Plan would connect as many existing or proposed units. The canyon's hydrologic characteristics are also important. Davidson Canyon collects drainage from the northeastern slopes of the Santa Rita Mountains and the northern and western faces of the Empire Mountains, and this runoff ultimately flows into Cienega Creek and through the Tucson Basin. Protecting the canyon in its natural form will maintain its important flood control capacity, as well as its natural recharge capabilities.

Vegetation -- The Davidson Canyon Natural Preserve encompasses both riparian and Sonoran Desert upland habitat, and its plant associations include the Velvet Mesquite-Mixed Scrub Association, Velvet Mesquite Association, Burroweed-Mesquite Association and the Creosote Association. The canyon's riparian habitat and spring-fed stream flows are its most significant and valuable features. Like the Cienega Creek corridor, the canyon's interior hosts an exceptional variety of plant and animal species, including velvet mesquite, whitethorn and catclaw acacia, cottonwood trees, seepwillow, saltbush, desert hackberry, graythorn, prickly pear, sacaton and deergrass. Upland plant species include the mesquite, palo verde, creosote, barrel cactus, ocotillo, yucca, and potentially the Pima Pineapple cactus, a listed endangered species.

Animal species -- Wildlife species likely to be found within Davidson Canyon include endangered leopard frogs, fish such as the long-finned dace, waterbirds, Mexican garter snakes, coyote, gray fox, skunk, collared peccary, bobcat, mule deer, and several varieties of bats, including the Mexican long-tongued bat. The Canyon's scenic values are another of its outstanding natural resources.

Santa Rita Mountain Park -- The proposed 10,703-acre Santa Rita mountain park is situated in the picturesque foothills of the Santa Rita Mountains south of Sahuarita Road and west of Davidson Canyon. The extensive natural resources encompassed by the Santa Rita Mountain Park include Fagan Lake, a man-made pond just outside the Coronado National Forest.

Vegetation -- The dominant vegetative community within the park is Semi-desert grassland that includes a variety of grasses, including grama grasses at higher elevations. According to the U.S. Fish and Wildlife Service, the parklands formerly featured an oak savannah with large trees; however, the agency believes that this plant community has been diminished over time. Lehmann's lovegrass, an exotic grass species, has infiltrated the park and continues to propagate.

Animal species -- One of the most notable features of the Santa Rita Mountains is the tremendous diversity of wildlife that inhabits the range. In addition to the usual desert species that can be found in the area, such as mule deer, white-tailed deer, javelina, quail, cottontails and the like, the area is also home to the Mexican opossum, the coatimundi and mountain lions. A large variety of birds can also be found in the area, including hummingbirds, several kinds of hawks, Golden eagles, and the tropical kingbird. Reptiles are also plentiful, and include several kinds of rattlesnakes, frogs such as the lowland leopard frog, (a species of special concern) and the western barking frog, gila monsters, and the Sonoran desert tortoise. The area is noteworthy for its large population of bats, which features the Mexican long-tongued bat, the Pale Townsend's big-eared bat, the California leaf-nosed bat, the Ghost-faced bat, and the Western red bat. The Santa Ritas may also support a broad range of threatened and endangered species. Listed-endangered species known or believed to exist in the range and on surrounding lands include the American peregrine falcon, the cactus ferruginous pygmy owl, the jaguarundi, the Lesser long-nosed bat, the pima pineapple cactus, and the Gila topminnow. Listed-threatened species include the Mexican spotted owl.

Recreation potential -- The area is presently lightly used for recreational purposes, partially because of its distance from urban Tucson and partially because it is not well-known. The park does have several existing primitive roads and trails, some of which are listed on the Eastern Pima County Trail System Master Plan.

3. Upper Santa Cruz Subarea

The Upper Santa Cruz Subarea encompasses the Santa Rita Experimental Range and substantial holdings by the United States Forest Service. Ongoing discussion related to the Canoa Ranch conservation initiative could lead to additional protected acreage within this subarea.

4. Middle Santa Cruz Subarea

Despite being the most highly urbanized subarea of Eastern Pima County, the Middle Santa Cruz area includes the large reserve of the Coronado National Forest, part of Saguaro National Park, and part of Tucson Mountain Park. Pima County's Agua Caliente Park is also within this watershed subarea. A number of proposals to preserve acreage of less than one section each are included in the draft *Preliminary Mountain Parks Element*. Many of these relate to Tucson Mountain Park, which is described briefly below.

Tucson Mountain Park -- Tucson Mountain Park, formed from volcanic and fault block activity that began an estimated 70 million years ago, is presently Pima County's largest Natural Resource Park and is one of Tucson's most-visited natural areas. Pima County manages 2,514 acres owned by the Bureau of Reclamation adjacent to the western boundary of the park. Saguaro National Park adjoins the County park to the north, adding 24,034 acres to this area.

The vegetation within the Tucson Mountains is classified as a subtropical desertland located within the Arizona Upland subdivision of the Sonoran Desert. A variety of plant communities and associations are represented within this category, with the most prevalent being the palo verde-saguaro association. Several uncommon species, including night-blooming cereus and Tumamoc globeberry, are known to occur. The park is home to large and healthy populations of saguaro, prickly pear, barrel, cholla and ocotillo cactus, mesquite, palo verde and ironwood trees, and a variety of other Sonoran desert vegetation.

Animal species found in the park include coyotes, javelina, cottontail and jackrabbits, and mule deer. Other noteworthy wildlife found in the park include bobcats, gray foxes, mountain lions, desert tortoises, gila monsters and a variety of bats and bird species. More than 230 vertebrate species are common to the area, as well as literally thousands of invertebrates. Sensitive species that may be found in the park include the Lesser long-nosed bat and the California leaf-nosed bat. The possibility that the cactus ferruginous pygmy-owl may use the park, and the suitability of its habitat for this listed endangered species, led to the inclusion of Tucson Mountain Park in Unit 2 of the U.S. Fish and Wildlife Service's recent critical habitat designation for the owl.

Cultural resources -- Tucson Mountain Park contains a variety of valuable cultural resources, including prehistoric archaeological sites, rock art sites, historic structures, old mines and trails, traditional O'odham saguaro fruit gathering sites and other traditional cultural places, and natural features of the land that together form a significant cultural and historic landscape.

Recreation potential -- The park includes 26 miles of trails open to hikers, equestrians and mountain bicyclists, an archery range, a rifle range, a campground and picnic areas, and is home to the Arizona-Sonora Desert Museum, the Sonoran Arthropod Research Institute, and Old Tucson Studios.

5. Tortolita Fan Subarea

The Tortolita Fan subarea includes Forest Service and National Park land, in addition to the Catalina State Park and the County's Tortolita Mountain Park. The major proposal to protect open space and endangered species habitat in the subarea is Pima County's application to the State Land Department to expand the Tortolita Mountain Park area.

Tortolita Mountain Park -- Tortolita Mountain Park was established in 1986, when the Pima County Board of Supervisors approved the expenditure of 1986 bond funds to acquire 3,055.75 acres of private property in the rugged backcountry of the Tortolita Mountains for park purposes. The first 2,426.75 acres was purchased in 1986, and another 629 acres was added in 1988. Several recent acquisitions have brought Pima County's current holdings in the

Tortolitas to 3,445.75 acres. The Tortolita Mountains are one of the oldest geological features in the Tucson area, and include 4,651 foot tall Tortolitas Peak, the highest point in the range. On November 10, 1998, the Board approved County applications to the Arizona Preserve Initiative to expand Tortolita Mountain Park by 25,744 acres. The application includes the Tortolita alluvial fan and Ironwood Forest area, which would serve as a key area for the recovery of the pygmy-owl.

Vegetative communities located within the present boundary of the park include Sonoran Desertscrub, Paloverde-Cacti-Mixed Scrub Series, Interior Chaparral, Scrub Oak Series, Sonoran Riparian Deciduous Forest and Woodland, Mesquite Series; Sonoran Riparian Deciduous Forest and Woodland, Cottonwood-Willow Series, and Sonoran Riparian Scrubland, Mixed Scrub Series. The majority of the park is considered to be within the Sonoran Desertscrub biotic community. The alluvial fan area is home to a large and impressive ironwood forest, and some of the trees within the forest are believed to be hundreds of years old. The density and superlative quality of the ironwood forest make it prime potential habitat for the cactus ferruginous pygmy-owl, and led to its inclusion in the U.S. Fish and Wildlife Service's critical habitat designation for the owl. While Park's staff knows of no special status plant species identified within the current boundaries of the park, the lands do contain large, undisturbed, healthy stands of saguaro, barrel, ocotillo and cholla cactus, mesquite, palo verde and ironwood trees, as well as a wide variety of native grasses, bushes and other plants.

Animal species -- The Tortolita Mountains area supports a wide range of wildlife, and is capable of supporting certain special status wildlife species. The park's proposed expansion lands contain habitat considered suitable for the pygmy-owl. The Sonoran desert tortoise, a species of special concern, is commonly found within the kind of Paloverde-Cacti Mixed Scrub Series habitat found in and around the park, and may be present there. Other special status wildlife found on and around the subject lands include the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, and the California leaf-tongued bat. A wildlife survey conducted as a part of the master planning process for the park in 1996 identified a wide range of animal and bird species, including mountain lion, peccary, mule deer, and large numbers of birds and lizards. The Tortolita Mountains are also home to a small herd of wild horses--one of the few such herds remaining in southern Arizona.

Cultural resources -- The Tortolita Mountains area is rich in cultural resources. Evidence of occupation by Hohokam Indians can be found throughout the area. On the eastern side of the park, the most significant resource is the large and well-known "Indian Town" site, which is the park's first priority acquisition area. However, this area has not yet been systematically surveyed, and additional sites are expected to exist -- particularly along Honeybee Canyon and Sausalito Creek within the adopted park expansion boundary, and along Big Wash in the proposed Tortolita East Biological Corridor.

Catalina State Park Expansion -- The 5,511-acre Catalina State Park is situated in the western foothills of the Catalina Mountains adjacent to the Town of Oro Valley between the Coronado National Forest and the Oracle Highway. Catalina State Park's position and significance in the regional open space network led to its inclusion in both the 1997 Open Space Bond Program and the Sonoran Desert Conservation Concept Plan. The Bond Program identified about 1000

acres, and the Sonoran Desert Conservation Concept Plan identified approximately 2,500 acres of property north of the park for possible protection. The central purpose of the proposed expansion is to facilitate the establishment of a biological corridor that would link the Coronado National Forest, the Sutherland Basin, and Catalina State Park to the Tortolita East Biological Corridor and the Tortolita Mountains.

Vegetation -- Sections of two major wash corridors -- the Canada del Oro and the Sutherland washes--pass through the park, which protects the valuable riparian habitat within them. These washes and their tributaries support an extensive mesquite bosque. Other plant associations that occur within the park's riparian community include Arizona ash, cottonwood, sycamore, desert willow, oak, netleaf hackberry, Arizona walnut and Arizona cypress. Other major vegetation types found in the park include desert scrub, desert grassland, and foothill communities.

Animal species -- Species typically found throughout Catalina State Park and on the park's proposed northern expansion lands include javelina, coyote, jackrabbit, cottontail, bobcat, skunk, squirrels, mule deer, and bats, as well as a multiplicity of snakes, lizards and birds. The park provides habitat for migratory neotropical birds and also wintering peregrine falcon. Desert bighorn sheep have been sighted in the park and on surrounding lands in the past, although their numbers have declined to a bare few in recent years. The park's northern expansion lands contain habitat considered suitable for the endangered cactus ferruginous pygmy-owl. The Sonoran desert tortoise, a species of special concern, can be found within the habitat that exists in the area, and could conceivably be present on the expansion lands. Other special status wildlife that may exist on and around the subject expansion lands include the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, and the California leaf-tongued bat.

Cultural resources -- The lands presently within the boundaries of Catalina State Park are home to a wide range of valuable cultural resources. Investigations conducted by the Arizona State Museum and others have found tools, flakes and projectile points that are believed to date back to 5000 B.C. These investigations also suggest that the area was occupied by Hohokam Indians from about 300 B.C. to around 1500 A.D. Some 38 archeological sites have been located and recorded in the park, the most significant of which is the Romero Ruin or "Pueblo Viejo." The Romero Ruin is a classic Hohokam habitation site and historic ranch compound that covers approximately 30 acres, and features a stone compound wall, several rooms of stone masonry construction, rock and trash mounds, rock alignments that are believed to have been irrigation troughs, and two depressions that may have been used as ball courts.

Recreation potential -- Catalina State Park offers approximately 12 miles of recreational trail opportunities for hikers, equestrians and mountain bicyclists.

6A. Altar Valley Subarea

The major federal land holder in the Altar Valley the United States Fish and Wildlife Service. The National Forest Service and the Bureau of Land Management also manage land in Altar Valley, with other stewardship occurring primarily by ranchers in the vast land base.

Conservation initiatives in the area have been discussed primarily in the context of the Ranch Conservation Element of the plan. Similarly, the Cerro Colorado Ranch Conservation Area is a proposal that is cast in the framework of ranchland use.

Cerro Colorado Ranch Conservation Area -- Compared to the sprawling mountain ranges that house county conservation areas, the Cerro Colorado Mountains, which cover an area of about 13 square miles, are relatively small. Despite its less-than-imposing stature, this compact range, named for its rocky red volcanic form, is among the most scenic and biologically diverse in southern Arizona. The craggy peaks of the Cerro Colorados, located less than 6 miles due south of the Sierrita Mountains and immediately north of the Arivaca Road, rise above the surrounding countryside to a height of 5,319 feet.

Vegetation -- Plant communities in the mountains and its surrounding area include grasslands at lower elevations, as well as additional grassland and the Madrean evergreen-oak community at higher elevations. The Pima pineapple cactus, a listed endangered plant species, exists in the area and may also occur within the boundaries of the park.

Animal Species -- The Cerro Colorados boast an impressive roster of wildlife species, including, as previously noted, mule deer, white-trail deer, javelinas, and coatimundis, as well as cliff-dwelling raptors such as the rarely-seen golden eagle. Special status wildlife species in the area include the jaguar and the masked bob-white quail--both of which are listed endangered species--and the Northern gray hawk, Pale Townsend's big-eared bat and Sonoran desert tortoise, all species of special concern. The proposed Ranch Conservation Area will also protect a key portion of the area's watershed. The Cerro Colorado's watershed features are of critical importance because they help sustain several nearby riparian areas, including riparian habitat in the nearby Buenos Aires Preserve. Wildlife authorities have noted that this habitat is especially important for migrating neotropical birds.

6B. Avra Valley Subarea

Earlier proposals included discussion of conserving the Silverbell Mountains and Waterman Roskrige mountain area. This has been achieved through the establishment of the Ironwood Forest National Monument on June 9, 2000. Managed by the Bureau of Land Management as part of the Department of Interior's new National Landscape Conservation System, this Monument signals that the conservation ethic can and should be a part of multiple land uses promoted by a wide variety of interested members of the community. We are looking forward to continuing our partnership with the Bureau of Land Management as they conduct the planning process for the Ironwood Forest National Monument.

A goal of future planning will be to connect the land between the Tucson Mountain Park and Saguaro National Park (West) area to the Ironwood Forest National Monument.

III. Conclusion

The draft *Preliminary Mountain Parks Element* is summarized on the map that follows. It includes:

- The proposed Las Cienegas National Conservation Area
- The proposed new Santa Rita Mountain Park
- Two proposed Natural Reserves: Davidson Canyon and the Buehman Bingham Reserve
- Expansions of existing Mountain Parks, including the Tortolita Mountain Park, Colossal Cave Mountain Park, and Catalina State Park.
- A Ranch Conservation Area proposed for the Cerro Colorado Mountains.

Total acreage for these Mountain Park proposals, including the Las Cienegas National Conservation proposal, is approximately 250,000 acres. Greater conservation commitments will be achieved through the Ranch Element, as we find ways to prevent the fragmentation of ranch land. The Riparian Element, and the habitat and corridors conserved to meet the biological goals of the Sonoran Desert Conservation Plan will add dimension to the ultimate reserve and address practical compliance issues at the same time.

A new era for Pima County parks has arrived. Not only do parks protect viewsheds, they serve as corridors, connecting biologically significant areas. Mountain Parks will preserve in perpetuity both the beauty and long term sustainability of our resource base.

The parks and open space aspects of the Sonoran Desert Conservation Plan will take many years to implement. Almost a full century after the first land was conserved in Eastern Pima County, it is our privilege to find that we still have patches of valuable land in our midst and are inspired to take actions to conserve them.

Sonoran Desert Conservation Plan

Mountain Parks and Natural Reserves

-  Proposed Mountain Park Expansion
-  Proposed Natural Reserve
-  Proposed New Mountain Park
-  Proposed NCA
-  Proposed Ranch Conservation Areas
-  Urban/Private Property
-  Existing Reserves
-  Indian Nation



DRAFT PRELIMINARY MOUNTAIN PARKS ELEMENT

Introduction

When Lewis and Clark roamed throughout the west in the early 1800's, they explored a pristine, undeveloped wilderness teeming with wildlife. The wide open west seemed so vast and endless that Thomas Jefferson predicted it would take centuries before the nation could populate and fill the land. At the time, the thought that people could make a lasting impact on such immense tracts of wilderness was unimaginable.

As people moved out west into the frontier, they quickly explored, discovered, and utilized available resources. The presence of the early frontiersmen and those who followed were so devastating to wildlife and natural resources that Congress passed legislation authorizing the President of the United States to set aside public lands as reserves.

Most reserves in Pima County were created between 1902 and 1930 (see Figure 1). For the most part, these reserves have remained unchanged; however, growth and resource fragmentation has had a cumulative affect not only on the land itself, but on the resources these lands were set aside to protect.

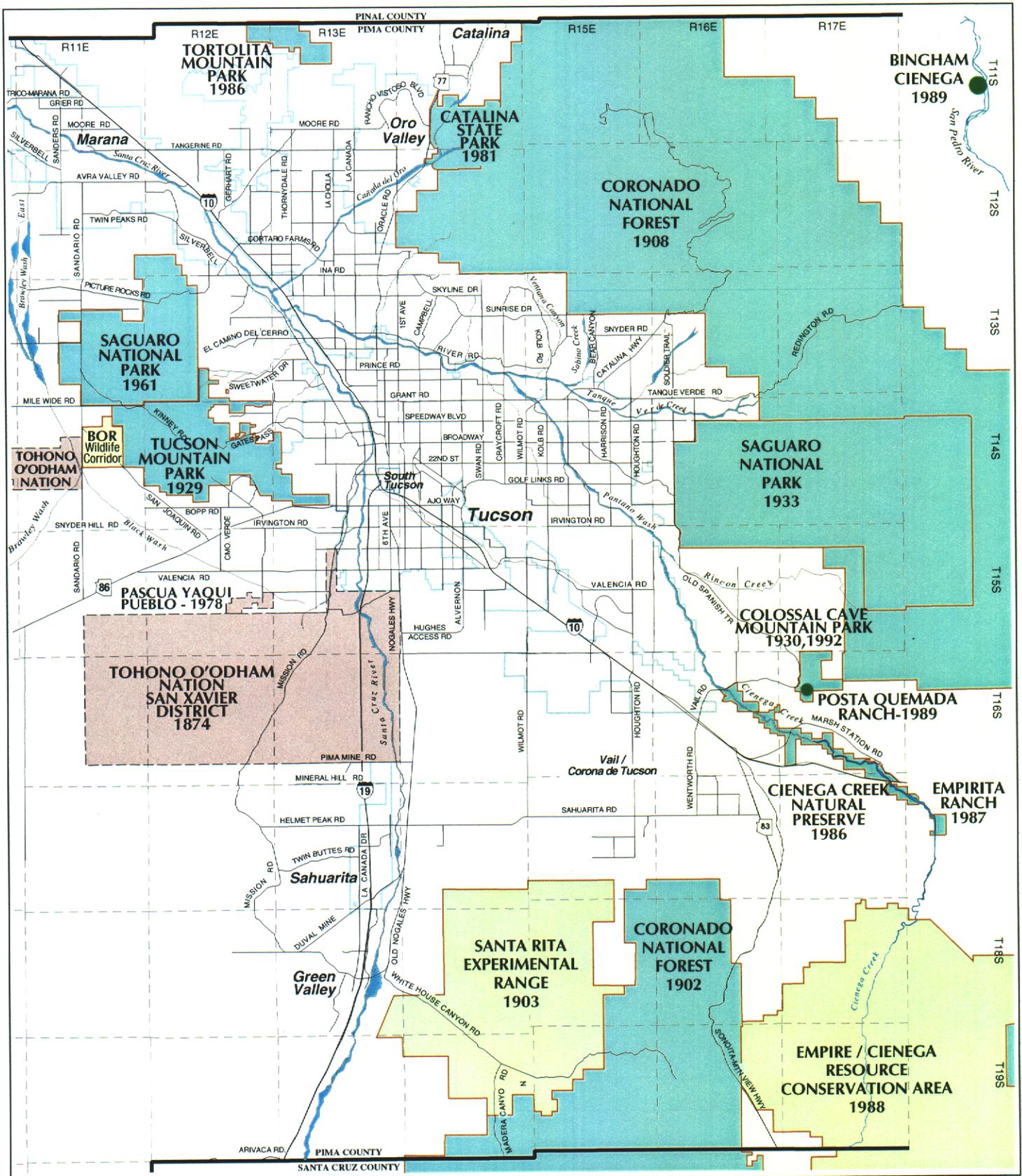
Pima County has almost 6 million acres of land, with diverse land characteristics ranging from "sky islands" to deserts and vast grasslands.

Some of this land is protected with a reserve designation (see Figure 2), ranging from Preserves, Wildlife Refuges, Resource Conservation Areas, National Parks and Monuments, Wilderness Areas, Mountain Parks, and State Parks. Stewards of these reserved lands consist of U.S. Fish and Wildlife, U.S. Bureau of Reclamation, U.S. National Park Service, U.S. Forest Service, U.S. Bureau of Land Management, State of Arizona, and Pima County.

Within this document additional proposed reserve acres are discussed. These parcels of land have been identified for additional protection due to factors such as land containing outstanding natural and biological resources (Figure 49). Many of these parcels of land are threatened with development.

The reserves in Pima County may provide the most beneficial and diversified use of public lands that exists today. The reserves provide a sanctuary for sensitive and non-renewable resources at a modest cost with multiple uses ranging from ranching to varying degrees of recreation including commercial enterprises.

Reserves within the county can serve the goals of the Sonoran Desert Conservation Plan by providing a vital link for the protection and long-term survival of the multiple species and their respective habitats on the verge of being lost or severely impacted.



Pima County Illustration 10/98

Reserved Public Lands in Eastern Pima County with Date of Establishment

- National Forests and Monuments, State and Regional Parks
- Restricted Use Areas
- Bureau of Reclamation Wildlife Corridor
- Indian Nations

Figure 1

Overview

The reserves of Pima County have been described in eight subarea reports. Each report features the existing reserves, as well as potential reserve expansions. Because the subarea boundaries are based on watershed boundaries, individual reserves may straddle several subareas. In this case, the reserve will be describe only once in the subarea in which the reserve has the most acres. Each subarea report contains elements describing the most important factors and features associated with each existing or potential reserve.

Each subarea report contains 13 elements describing the important factors and features associated with each subarea, including stressors, ranching, cultural resources, and recreational resources.

Due to the complexity of measuring each subarea and their respective reserves, the acreage described within this report is approximate only. Please refer to the GAP status table within each subarea for the most recent information known regarding acreage and level of protection within each respective subarea. As new information is received, this working document will be updated.

For the most part, the reserves described within this report are Pima County owned.

Middle San Pedro Subarea 1

The San Pedro Subarea is a large prominent desert riparian valley more thoroughly described in the Sonoran Desert Conservation Plan's *Resources of the Middle San Pedro Subarea*.

The San Pedro valley is bordered on the east by the Galiuro/Winchester Mountain ranges. The Galiuros are located primarily in Graham County and the Winchesters are located in Cochise County. While these ranges are not in Pima County, they do provide valuable connectivity to Pima County. The SDCP will address resources only with the county.

Existing Reserves

Coronado National Forest (Santa Catalina District): Fifty seven thousand acres of the Santa Catalina Mountain watershed borders the Middle San Pedro Subarea on the west; this large rugged mountain range is managed by the U.S. Department of Agriculture, Forest Service. The forest supports high value multi-species habitat and provides a critical link to the Middle San Pedro Valley Watershed. Private and state lands are located between the National Forest boundary and that of the San Pedro River.

Rincon Mountain Wilderness: The Rincon Mountain Wilderness area is one of two wildernesses within the Santa Catalina District. Although the overall size of the Wilderness area is 38,590 acres, only 17,293 areas are included within the Middle San Pedro subarea report.

Elevations in this Wilderness range from 3,000 feet to 7,786 and contain four life zones. The diverse biotic communities in this wilderness support nearly 900 plants.

Saguaro National Park Wilderness: Congress passed the National Wilderness Preservation Act in 1964 as a means to protect what remained of our irreplaceable resources and to insure that it would forever be a part of our national heritage. Saguaro National Park Wilderness area is one of two wildernesses located in the Rincon Mountains. The Saguaro National Park East Wilderness Area is managed by the U.S. Department of Interior, National Park Service. The Saguaro National Park Wilderness consists of 57,930 acres and borders the Coronado National Forest; however, only 8,921 acres fall within the Middle San Pedro Watershed.

Bingham Cienega Natural Preserve: The Pima County Flood Control District acquired 284 acres of land along the San Pedro River in 1989. Pima County has a management agreement with the Nature Conservancy for the management of this important resource. All 284.2 acres of the preserve are within the Middle San Pedro Watershed.

Buehman Canyon Natural Preserve: The Nature Conservancy either owns or manages all of the 2,796 acres of the Buehman Canyon Natural Preserve (BCNP). The BCNP provides a vital link between the Santa Catalina Mountains and the Middle San Pedro Watershed. Buehman Canyon provides a migration corridor for larger mammals as well as a reserve for the Gila topminnow and the desert pupfish, two rare southwestern native fish. The entire 2,796 acres are within the Middle San Pedro Subarea.

Potential Reserve Expansion

Potential Reserves and their respective elements will be discussed in each subarea report.

Bingham Cienega Expansion: (400 acres)
Buehman-Bingham Natural Preserve: (7,489)

Cienega-Rincon Subarea 2

The Cienega-Rincon Subarea is commonly referred to as the upper watershed of the Pantano-Rillito River system. This particular watershed is linked to a number of surrounding mountain ranges, some of which are outside of Pima County.

While it is understood that biodiversity does not stop at political boundaries, for the purposes of this report, the County line shall, for the most part, represent the subarea boundary.

Existing Reserves:

Cienega Creek Natural Preserve: The Cienega Creek Natural Preserve is located within the center reaches of the Cienega-Rincon Subarea. The Cienega Creek Natural Preserve is 4,000 acres in size and contains one of the few remaining perennial streams in Pima County. Beginning a short distance south of Interstate 10, the Preserve extends 12 continuous miles down stream to the Vail Bridge providing a vital link between the Empire Cienega Resource

Conservation Area and that of Colossal Cave Mountain Park and the Coronado National Forest (Rincon Mountains).

Colossal Cave Mountain Park: Colossal Cave Mountain Park covers approximately 2,000 acres located on the southeastern flank of the Cienega-Rincon watershed; the park is managed by the Pima County Parklands Foundation. The Agua Verde-Posta Quemada Creeks flow through the park connecting Cienega Creek Natural Preserve with the Coronado National Forest on the eastern side of the watershed. This connection provides a vital biological link between the Santa Rita Mountains to the west and the Empire-Cienega Resource Conservation Area to the south. The Colossal Cave Mountain Park is within the proposed Las Cienegas National Conservation Area.

Coronado National Forest: Similar to that of the Middle San Pedro watershed, both the Coronado National Forest and the Rincon Mountain Wilderness Area provide a vital biological link to the subarea. In this case, the Cienega-Rincon is the subarea connected with the Coronado National Forest through a myriad of smaller watersheds.

Rincon Mountain Wilderness: The Rincon Mountain Wilderness area is administered by the Santa Catalina Ranger District of the Coronado National Forest. This 14,733-acre watershed helps to link the San Pedro Subarea with that of the Cienega-Rincon Subarea.

Saguaro National Park (Rincon District): Similar to that of the Coronado National Forest, Saguaro National Park provides a sizeable portion of the Cienega-Rincon Subarea's eastern border. Both the park and its wilderness area account for 31,774 acres of Cienega-Rincon Subarea watershed. Saguaro National Park east connects with the Coronado National Forest on both northern and southern boundaries.

Mt. Wrightson Wilderness: The Santa Rita Mountains border the Cienega-Rincon Subarea on the Southwest; this large mountain range is within the Coronado National Forest and is managed by the Nogales Ranger District. A small portion (280 acres) of the Mt. Wrightson Wilderness area is included within Cienega-Rincon Subarea. The majority of the Mt. Wrightson Wilderness area is within Santa Cruz County and will not be described within the Sonoran Desert Conservation Plan.

Empire-Cienega Resource Conservation Area: The U.S. Department of Interior, Bureau of Land Management (BLM) manages the Empire-Cienega Resource Conservation Area. The Empire-Cienega is located at the upper end of the Cienega-Rincon Subarea. Although the Empire-Cienega is approximately 45,000 acres in total, only 70% (31,884 acres) will be addressed within the Cienega-Rincon Subarea report; the remaining portion is located in Santa Cruz County and will not be addressed within the Sonoran Desert Conservation Plan.

Potential Reserve Expansion

Cienega Creek Preserve

Colossal Cave Mountain Park: (approximately 4,000 acres)

Davidson Canyon Natural Preserve: (6,191)

Santa Rita Mountain Park: (10,702 acres)
Las Cienegas National Conservation Area

Upper Santa Cruz Subarea 3

The Upper Santa Cruz subarea is a large watershed bordered on the east by the Santa Rita Mountains and the West by the Sierrita Mountains. Much of the watersheds' upper reaches are actually located within Santa Cruz County; however, this report will only address that portion of the subarea within Pima County.

The downstream or northern portion of the watershed enters the Tucson Basin by way of the Santa Cruz River. The San Xavier District of the Tohono O'odham Indian Nation borders the Upper Santa Cruz Subarea on the west. The Tohono O'odham Nation is one of the largest reservations in the United States.

Existing Reserves

Coronado National Forest: The Santa Rita Mountain range is nearly equally divided between Pima County and Santa Cruz County. Most all of the mountain range is included within the Coronado National Forest and is managed by the Nogales Ranger District. Thirty seven thousand acres (37,071) of the National Forest is included in the Upper Santa Cruz Subarea and provides an expansive link to the Cienega-Rincon Subarea.

Mt. Wrightson Wilderness Area: The Mt. Wrightson Wilderness area is located within the larger Santa Rita Mountain Range, and managed by the U.S. Forest Service. Although much larger in size, the Mt. Wrightson Wilderness only provides 3,605 acres of actual watershed into the Upper Santa Cruz Subarea.

Santa Rita Experimental Range: The Santa Rita Experimental Range (SRER) consists of about 52,000 acres located at the northwestern edge of the Santa Rita Mountains. SRER was originally contained within the Santa Rita Forest, as established by Presidential Executive Order on April 11, 1902. In 1988 Congress authorized the transfer of SRER to the Arizona State Land Department. The University of Arizona is currently managing the property under lease from the State of Arizona.

Elevations range from 2,900 feet in the northwestern corner to about 5,200 feet in the southeastern part, providing a large biological connection between the Santa Cruz River and the Santa Rita Mountain Range. The entire SRER watershed is located within the Upper Santa Cruz Subarea.

Potential Reserve Expansion

Canoa Ranch conservation proposals

Middle Santa Cruz Subarea 4

The Middle Santa Cruz watershed surrounds the Tucson Basin. The Rillito and Santa Cruz Rivers are the most prominent watercourses.

Existing Reserves

Tucson Mountain Park: Located to the west of the subarea are the Tucson Mountains, a linear mountain range running from North to South. The Tucson Mountains have two reserves, Tucson Mountain Park, managed and operated by Pima County Parks and Recreation, and the Saguaro National Park West, managed and operated by the National Park Service.

The Tucson Mountains have been in public ownership since 1929 when President Roosevelt withdrew 30,000 acres from homesteading to create the mountain preserve. The Board of Supervisors officially designated the land as a County Mountain Park in April of 1929.

Tucson Mountain Park is linked to three of the subareas through its watersheds. Six thousand four hundred acres (6,466) connect the Middle Santa Cruz Subarea with that of Saguaro National Park and the Avra Valley Subarea.

Saguaro National Park West: In 1961 President John F. Kennedy transferred 15,360 acres from Tucson Mountain Park to the National Park Service for the creation of Saguaro National Monument West. At the time, all but a small portion of the park actually belonged to the Bureau of Land Management. In 1994 Congress changed the status of Saguaro National Monument to that of a National Park.

Like that of Tucson Mountain Park, Saguaros' watershed actually links this rich multi-species resource area with three of the subareas.

Saguaro National Park West Wilderness Area: In 1976, Congress designated 13,470 acres of the Tucson Mountain District as wilderness. Approximately 800 acres of the wilderness link the park with that of the Avra Valley Subarea. Overall, the Tucson Mountains form a vital biological connection between the Tucson Basin and three adjacent subareas.

Coronado National Forest: To the north and east of the Tucson Basin lies the Santa Catalina District of the Coronado National Forest. Although this district is the smallest unit within the Coronado National Forest, it has the largest number of visitors due to its proximity to the city. The district encompasses the Santa Catalina Mountains and a portion of the Rincon Mountains. Within the District are two Wilderness areas, the Pusch Ridge wilderness and the Rincon Mountain Wilderness -- more than 95,000 acres.

The Coronado National Forest is a large uninterrupted mountain range containing the Tucson Basin on the north and east and providing a large biological connection to four of the adjacent subareas.

Pusch Ridge Wilderness Area: As previously mentioned, the Pusch Ridge Wilderness is larger than its 42,550 acre watershed that connects the Middle Santa Cruz Subarea to that of the Coronado National Forest. Although the Pusch Ridge Wilderness Area was designated as wilderness for resource preservation, it's arguably impacted (by human use) more than any other wilderness in Pima County. Nonetheless, this rugged area of the forest provides a crucial connection between the forest, Saguaro National Park east and perhaps the fastest developing area within the Tucson Basin.

Saguaro National Park (Rincon District): Completing the Middle Santa Cruz watershed are the Rincon Mountains located to the East of the Tucson Basin. The majority of the Rincon Mountains are located within Saguaro National Park East. The park has 67,293 acres in total with 57,930 designated and managed as Wilderness. The U.S. Department of Interior, National Park Service (NPS) manages Saguaro National Park East.

The East unit provides an uninterrupted ascending biological connection from the Middle Santa Cruz subarea floor to that of Spud Rock (8,614-feet) the highest elevation within the Rincon Mountains.

Saguaro National Park East Wilderness Area: As previously mentioned, 57,000 acres of the Rincon District are designated as wilderness, however, only 22,133 acres actually connect to the Middle Santa Cruz Subarea. Most of the higher elevations found within the East Unit are designated as wilderness. The Saguaro National Park East Wilderness abuts that of the Coronado National Forest forming a large biological connection, with long-term protection, between the San Pedro and Middle Santa Cruz Subareas.

Rincon Mountain Wilderness Area: Like that of the Saguaro National Park, only a small portion (4,893 acres) of the Coronado National Forest Rincon Mountain Wilderness area actually connects to the Middle Santa Cruz Subarea. The Rincon Mountain Wilderness watershed is divided between three subareas i.e. (San Pedro, Cienega-Rincon and Middle Santa Cruz).

The Rincon Mountain Wilderness contains valuable multi-species habitat ranging from 3,000 feet to 7,786 (at Wrong Mountain). The diverse biotic communities in this wilderness support nearly 900 plant species and provide a valuable resource connection between the San Pedro Subarea and the wilderness area of Saguaro National Park East.

Agua Caliente Park: Agua Caliente Park is a 101 acre wetland reserve located on the eastern side of the Tucson Basin at the foot of the Coronado National Forest. Agua Caliente has a total of five man-made ponds that are fed by an on-site spring (Agua Caliente Spring). Two of the ponds are currently dry; the other three have numerous species of exotic fishes that provide wildlife viewing opportunities for park visitors. Approximately 30 acres of the park is closed to public entry in order to protect sensitive wildlife habitat.

Potential Reserve Expansion:

Tucson Mountain Park General
Tucson Mountain Park Painted

Tumamoc Hill
Tucson Mountain Park Robles Pass
Sabino Canyon
Agua Caliente Creek
Tanque Verde Creek
Mt. Lemmon Highway Base

Tortolita Fan Subarea 5

The Tortolita Fan Subarea fronts the Tortolita Mountain Range on three sides. Located at the northern edge of Pima County, this "sky island" provides a biological reserve between the Tucson Mountains and the Catalina Mountains. The Tortolita Mountains extend well into Pinal County; however, the focus of information will pertain to those lands within Pima County.

Existing Reserves

Tortolita Mountain Park: Tortolita Mountain Park is predominately located towards the top of the mountain range with a small segment of the park actually straddling the Pima-Pinal County line. The majority of the 3,000+ acre park was first acquired in 1986 from ranchers Martin, Pace and Poteet. The Martin family continues to cattle ranch on a sizeable portion of land surrounding the park, most of it State Lease Lands.

Coronado National Forest: Twenty three thousand acres of forest connect the Tortolita Fan subarea with that of the San Pedro and Middle Santa Cruz. The Coronado National Forest has the largest watershed (23,554 acres) providing an interconnection between Catalina State Park and the Pusch Ridge Wilderness Area.

This particular watershed ascends from 2,800 feet at the forest boundary to the highest point in the Catalina Mountains (Mt. Lemmon) at 9,157 feet.

Pusch Ridge Wilderness Area: The 56,933-acre Pusch Ridge Wilderness area was created in 1978. Providing a critical biological link between subareas, this rugged mountain range extends from the desert floor (between subareas 4 and 5) to high reaching peaks covered with pine and aspen trees. Fourteen thousand acres of watershed connect the Pusch Ridge Wilderness Area with that of the Tortolita Fan Subarea on its eastern side.

Catalina State Park: The 5,511-acre State Park is located in the western foothills of the Catalina Mountains adjacent to the Town of Oro Valley between the Coronado National Forest and the Tortolita Mountains. Catalina State Parks' entire watershed falls within the Tortolita Fan Subarea providing a critical biological link between the Canada del Oro River and the Pusch Wilderness Area. Catalina State Park along with the Coronado National Forest creates the eastern border of the Tortolita Fan Subarea.

Saguaro National Park Tucson Mountain District: Saguaro National Park's 5,515 acres of subarea watershed provides a necessary biological link between the Tucson Mountains and the

Tortolita Mountains. The parks peaks and ridgelines help create the western boundary of the Tortolita Fan Subarea. Saguaro National Park West is only a portion of a much larger "Sky Island" (the Tucson Mountains).

Saguaro National Rincon Mountain Wilderness Area: Saguaros' wilderness accounts for 2,985 acres of the Tortolita Fan Subarea. The Saguaro National West Wilderness Area provides a multi-specie habitat while linking the Tortolita Fan Subarea to that of Subarea 4(Middle Santa Cruz) and 6B (Avra Valley).

Arthur Pack Park: Formerly U.S. Bureau of Land Management property, the 600-acre park was acquired from BLM for parks and recreation purposes. Arthur Pack Park is located within the town limits of Marana, one of the fastest developing areas within the Tucson Basin. The Park continues to remain as a small natural reserve within a highly developed urban area. The southern portion of the park includes approximately 100 acres of lush ironwood desert habitat that supports numerous plant and animal species.

Potential Reserve Expansion

Catalina State Park. (2500 acres)
Tortolita Mountain Park. (34,000 + acres)

Altar Valley Subarea 6a

The Altar Valley Subarea is the largest of all subareas excluding the Tohono O'odham Nation. This subarea extends from the Mexico border on the south to the Avra Valley subarea on the north.

Existing Reserves

Baboquivari Wilderness Area: The western edge of the subarea is bordered by the Baboquivari Mountain range, a majestic sky island stretching for over thirty miles in length and ranging in elevation from 3600 feet (at the toe) to it's highest peak (Baboquivari Peak) at 7,734 feet. The Baboquivari Peak Wilderness is managed by the Bureau of Land Management.

Coyote Mountain Wilderness Area: Just to the northern of the Baboquivai Mountains are the Coyote Mountains, a detached extension of the Baboquivari Mountains. The northwest corner of this small mountain range extends into the Tohono O'odham Nation. The Coyote Mountains Wilderness Area encompasses 5,080 acres of the Coyote Mountains and includes a watershed of 3,726 within the Altar Valley Subarea. The Bureau of Land Management manages the Coyote Mountain Wilderness Area.

Coronado National Forest: Unlike the western edge of the subarea, the eastern edge is bordered by several isolated mountains each having its own identity. The Coronado National Forest has a 30,375- acre watershed, linking the forest with Buenos Aires National Refuge creating a large portion of the subareas' eastern boundary.

Buenos Aires National Wildlife Refuge: Proceeding north, the Buenos Aires National Refuge, (115,498 + acre refuge) is managed by the US Fish and Wildlife Service and has the largest (reserve) watershed within the Altar Valley Subarea. Buenos Aires National Refuge abuts the Coronado National Forest on the east as well as the Baboquivari Wilderness Area to the west.

Buenos Aires was established as a National Refuge on August 1, 1985 for the preservation of the endangered masked bobwhite quail. The refuge contains extensive grasslands with the only Cienega (Arivaca Cienega) within the Altar Valley Subarea. This multi-species habitat provides the largest biological connection within the Altar Valley.

Tucson Mountain Park: Rounding out the eastern edge of the Altar Valley Subarea is the Tucson Mountains. Tucson Mountain Parks' 7,153-acre watershed connects the Altar Valley Subarea with that of the Middle Santa Cruz. Not unlike those resource lands found within Saguaro National Park West and the Coronado National Forest, Tucson Mountain Park provides multiple recreation opportunities for numerous people while maintaining a valuable multi-species habitat.

U.S. Bureau of Reclamation Wildlife Mitigation Corridor: Established in 1990 to help mitigate the impact of the Central Arizona Project canal, the 2,514 acre mitigation corridor created a biological link between Tucson Mountain Park and the Tohono O'odham Nation. The Tucson Mountains, already isolated by urban development, was being further biologically separated from other gene pool resources by the canal existence. Seven wildlife crossings were constructed within the mitigation corridor.

Potential Reserve Expansion

Tucson Mountain Park
Cerro Colorado Ranch Conservation Area (14,254 acres)

Avra Valley Subarea 6b

The Avra Valley Subarea is located at the northern end of the Brawley Wash watershed. The Avra Valley Subarea is flanked on the west by a chain of disconnected mountains bordered by the Tohono O'odham Nation.

Existing Reserves

Saguaro National Park Tucson Mountain District: The Avra Valley Subarea is flanked on the east by the Tucson Mountains.

Tucson Mountain Park: As previously reported, Tucson Mountain Park is managed by the Pima County Parks and Recreation Department as a natural resource park. The park is heavily used with an annual visitation in excess of one million visitors per year.

Three commercial businesses operate under lease agreements within the park. Two of the businesses, Old Tucson and The Arizona-Sonora Desert Museum attract well over 500,000 visitors (each) on an annual basis. The third business, Sonoran Arthropods, is an educational institute that is only open to educators and students by reservation.

Wildlife Mitigation Corridor: As described within the Altar Valley Subarea, the Wildlife Mitigation Corridor is a 2500 acre reserve owned by the U.S. Bureau of Reclamation and jointly managed by the Pima County Parks and Recreation Department and the Arizona Game and Fish Department. The mitigation corridor was established to mitigate the impact of the Central Arizona Project Canal on the Tucson Mountains.

Ironwood Forest National Monument: President William Clinton authorized, by proclamation, a new 129,000-acre national monument on June 9, 2000. The newly created Ironwood Forest National Monument encompasses the Roskrige-Waterman-Ragged Top and Silverbell Mountains in Pima County. The saguaro-ironwood rich habitat is comprised primarily of property with State and Private in-holdings.

Potential Reserve Expansion

City of Tucson: Due to the uncertain designation of lands owned by the Tohono O'odham Indian Nation, (next to the Ironwood National Monument) protection of lands administered by the City of Tucson Water Department may be vital to insure long-term viability of the Wildlife Mitigation Corridor.

Western Pima County Subarea 8

The Western Pima County Subarea is the largest of all subareas with the exception of the Tohono O'odham Nation. Located west of the Tohono O'odam Reservation, the Western Pima County Subarea is more than 120 miles from Tucson.

Existing Reserves

Cabeza Prieta National Wildlife Refuge: Located on the western border of the Subarea, the Cabeza Prieta National Wildlife Refuge encompasses 860,010-acres of remote arid desert habitat extending well into Yuma County. The massive refuge connects with the Arizona-Mexico border to the south and with Pima-Maricopa County on the north. The refuge's western border connects with the Pima-Yuma County Line. The U.S.Department of Interior, Fish and Wildlife Service manage the refuge.

Organ Pipe Cactus National Monument: Like that of the Cabeza Prieta National Wildlife Refuge, Organ Pipe National Monument borders Mexico on its southern boundary. Organ Pipe is 330,689 acres in size and is the largest National Park Service unit in southern Arizona. In 1978 Congress designated around 312,000 acres of the Monument as "Wilderness". The U.S.Department of Interior Park Service manages organ Pipe Cactus National Monument.

Goldwater Gunnery Range: The 2,700,000 acre Goldwater Air Force Gunnery Range is primarily located in Yuma and Maricopa Counties. Fifty Eight Thousand (58,796) acres are actually within the Cabeza Prieta National Wildlife Refuge. The Luke Air Force Base located in Phoenix, Arizona manages the Barry M. Goldwater Gunnery Range.

Mountain Parks, Reserves and Biologically Significant Resource Lands

MIDDLE SAN PEDRO SUBAREA

Sonoran Desert Conservation Plan

July 2000

Introduction¹

The Middle San Pedro subarea (Figure 3) in Pima County is part of the Middle San Pedro River Basin which stretches from Pomerene, Cochise County, to San Manuel in Pinal County. Significant ecological features in the San Pedro Basin include perennial river flow, cottonwood-willow forests, mesquite bosques, side canyons with perennial flow and deciduous broadleaf forests, a desert cienega, and several rare or declining plant and animal species.

The San Pedro River, which begins in three mountains ranges in Sonora and the Huachuca Mountains in Arizona, is considered the best example of a desert riparian system remaining in the southwest. The basin has elements of the Sonoran Desert, Chihuahuan Desert, and Apachean Highland ecoregions. The subarea encompasses portions of several open space corridors connecting the Rincon and Santa Catalina Mountains to the Galiuro Winchester Mountains. The corridors can be defined by the pairs of large drainages (for example, Buehman Canyon and Redfield Canyon; Soza Canyon and Soza Wash) that provide travel corridors for wildlife species across the basin.

Current land uses consist of cattle ranching, alfalfa farming, low-density rural residential housing and conservation land. Redington, with a population of sixty-six, is the principle settlement in this subarea. The town and local ranches are accessible only by dirt roads leading over Redington Pass or along the San Pedro River.

Today, diverse areas such as native grasslands, riparian woodlands, streams, and cienegas with perennial flows offer an environment that supports a number of rare species. Lands managed by the U.S. National Forest Service, U.S. National Park Service, Pima County and The Nature Conservancy offer protection to a portion of this unique environment and the species that depend on it.

The proposed conservation efforts in Pima County add key linkage to conservation work both upstream and downstream of the subarea. Partnerships between local, state, and federal agencies along with the efforts of private, non-profit organizations will conserve an immensely diverse area rich in natural and cultural resources.

Reserved land in this subarea includes the Coronado National Forest, the Rincon Mountain Wilderness, Saguaro National Park Wilderness, the City of Tucson's A-7 Ranch, and the Nature Conservancy's Buehman Canyon. The Pima County owned Bingham Cienega Natural Preserve is found along the San Pedro River in this subarea. Table 1 lists reserved land and managing entities within this subarea.

Potential reserve expansions include the Buehman-Bingham Natural Preserve and an acquisition for the Bingham Cienega Natural Preserve (see Table 1 for acreage).

¹Introduction based on the report, "Middle San Pedro River Subarea Concept Plan" by Dave Harris of The Nature Conservancy. *Resources of the Middle San Pedro Subarea*. Pima County, 2000.

Figure 3

Middle San Pedro

SDCP PLANNING AREA 1

- Major Streets
- Major Washes
- Sub-Area Boundary
- FWS Pygmy Owl Critical Habitat Units
- Coronado National Forest
- Pusch Ridge Wilderness Area
- Butterfly RNA
- Bingham Natural Preserve
- The Nature Conservancy - Fee Simple
- The Nature Conservancy - Easements
- Saguaro National Park East
- Saguaro National Park East Wilderness Area
- Rincon Mountains Wilderness Area
- Colossal Cave
- Cienega Creek Natural Preserve
- Wildlife Corridor Links

Pima County Index Map



Index Map Scale 1:500,000

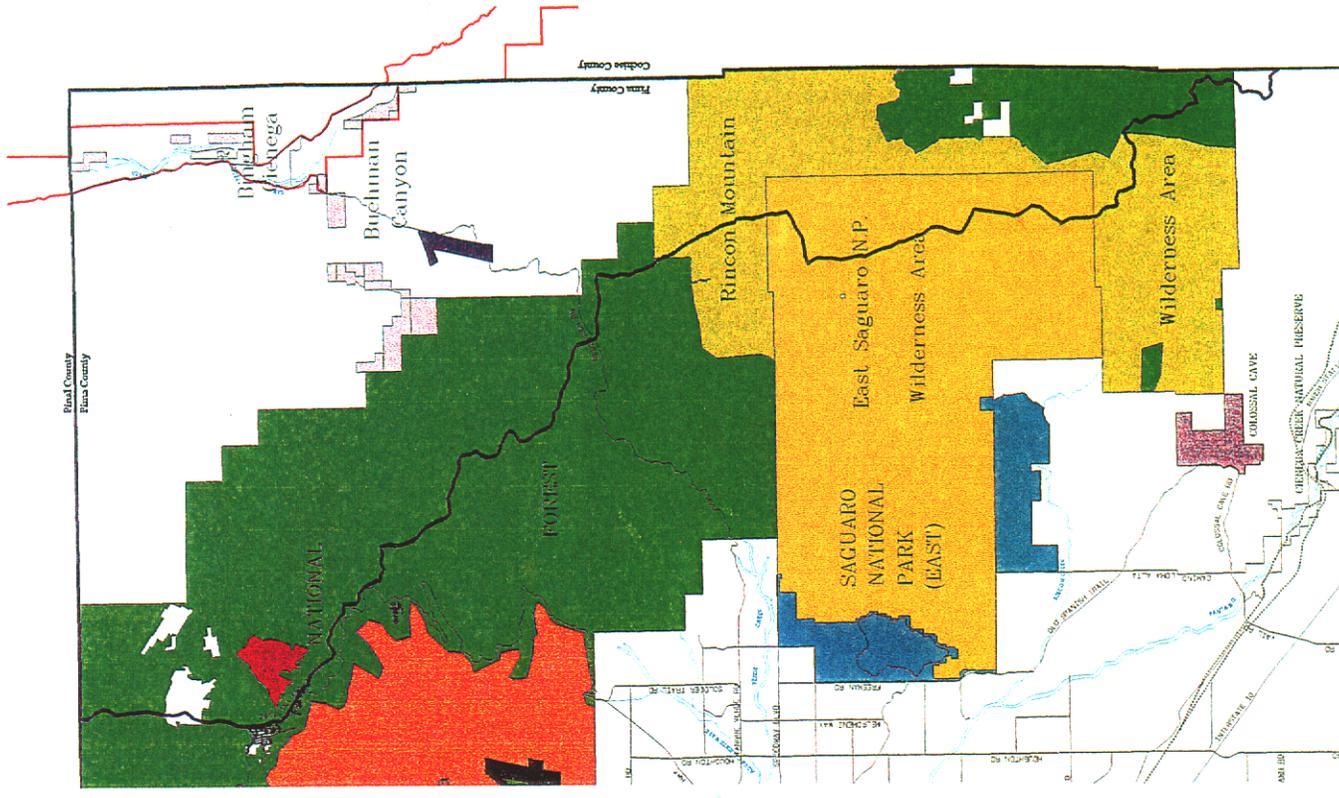


Scale 1:70,000



THE OTHER SIDE OF THE EQUATION
TECHNICAL SERVICES
 Pima County Technical Services
 1000 North First Avenue, Suite 100
 Tucson, Arizona 85717-1000
 TEL: (520) 298-3400
 FAX: (520) 298-3400

Approved for use as a reference map by the Pima County Board of Supervisors on 11/14/00



GAP Status of San Pedro Subarea

The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 1).

The San Pedro Subarea has 128,638 acres of protected land, including lands in the Coronado National Forest, Saguaro National Park, Bingham Cienega Natural Preserve, the A-7 ranch, and The Nature Conservancy deeded and easement lands. Within this subarea, 74 percent of the land is reserved. Land outside of existing reserves (unreserved Status 4 land), including private, state, or other land, have a total of 45,677 acres.

The addition of 7,889 potential reserve acres would make a total 136,527 acres of protected land, with 78 percent of the San Pedro Subarea in Status 3b or higher. The remaining 22 percent of land is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the Multi-species Habitat Conservation Plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 2 lists the priority vulnerable species.

Vulnerable Biological Features

Important features in this subarea are native grasslands, riparian woodlands, streams and cienegas with perennial flows, and areas of Critical Habitat for the cactus ferruginous pygmy-owl. Table 2 lists priority streams and springs found within the subarea.

Potential Stressors

Potential stressors in this subarea include habitat alteration, conversion of vegetative cover, human use and overuse, mineral extraction, conversion of ranches and other large agricultural tracts, disease and competition with non-native species.

Table 1

Existing Reserves in the Middle San Pedro

Land Manager	Existing Reserves	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
The Nature Conservancy	Bingham Cienega Natural Preserve	285				x		
U.S. Forest Service	Coronado National Forest	57,738					x	
	Rincon Mountain Wilderness	17,293	x					
U.S. National Park Service	Saguaro National Park Wilderness (Rincon District)	8,921	x					
The Nature Conservancy	The Nature Conservancy (deeded or easement lands)	2,796		x				
City of Tucson	A-7 Ranch	41,605					x	
Total Existing Reserves		128,638						
Total Acres of the San Pedro Subarea		174,315						

Potential Reserve Expansions in the San Pedro Subarea

Land Manager*	Potential Reserve Expansions**	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
The Nature Conservancy	Bingham Cienega Natural Preserve Expansion	400					x	
	Buehman-Bingham Natural Preserve	7,489					x	
Total Acres of Existing and Potential Reserves		136,527						
Total Acres of the San Pedro Subarea		174,315						

* Managing entities may change with the acquisition of land

**Until further planning is done, the GAP status of potential reserves cannot be known. It is assumed the level of protection will be Status 3b or higher.

Table 2: Middle San Pedro Priority Vulnerable Species, Streams, and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Buehman Canyon	70 spring locations
<i>Idionycteris phyllotis</i> Allen's big-eared bat	Espiritu Canyon	62 owned by U.S. Forest Service
<i>Lasiurus blossevillii</i> Western red bat	San Pedro River	5 owned by U.S. National Park Service
<i>Leptonycteris curasoae</i> Lesser long-nosed bat	Bingham Cienega	2 Privately owned
<i>Aimophila carpalis</i> Rufous-winged sparrow	Youtcy Canyon	1 on State land
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	Bullock Canyon	
<i>Empidonax traillii extimus</i> Southwestern willow flycatcher	Miller Creek	
<i>Pipilo aberti</i> Abert's towhee		
<i>Vireo belli</i> Bell's vireo		
<i>Terrapene ornata luteola</i> Desert box turtle		
<i>Rana yavapaiensis</i> Lowland leopard frog		
<i>Agosia chrysogaster</i> Longfin dace		
<i>Catostomus clarkii</i> Desert sucker		
<i>Catostomus insignis</i> Sonora sucker		
<i>Sonorella sabinoensis buehmanensis</i> Talus snail		

Existing Stressors

The San Pedro River, which begins in three mountains ranges in Sonora and the Huachuca Mountains in Arizona, is considered the best example of a desert riparian system remaining in the southwest. The conversion of ranches and agricultural properties to smaller lots is a concern not only because of habitat alteration, fragmentation, and loss, but because of the potential for increased groundwater pumping.

Non-native species, such as feral hogs, exotic fish, and frogs, are present along the San Pedro River. These species compete with and use native wildlife for food and can introduce disease. Exotic plants can change the composition and structure of the native riparian communities, reduce habitat diversity, reduce water availability for native species, and increase the potential for fires.

Contributing to biological stress are increased residential development, clearing of agricultural fields, groundwater pumping, diversion of stream flows, mineral extraction, livestock overgrazing, fire suppression, and off-road vehicle use and recreation overuse.

Ranching

The San Pedro Valley has a number of ranches that encompass some 272 square mile in Pima County. Most ranches include both private lands and leases from the State of Arizona and the U.S. Forest Service. A total of 1,917 animals may be grazed throughout the San Pedro subarea.

Currently, there are no farms within this watershed devoted to the production of food or fiber crops. However, there are 2,131 acres of pasture lands along the river that may be used for irrigation purposes.

Cultural and Historical Resources

Archaeological research began in the San Pedro Valley in the 1950's. At that time, the University of Arizona recorded numerous Hohokam villages north of Mammoth.

In the 1990's, the Center for Desert Archaeology turned the San Pedro Valley into an archaeological laboratory where theories are tested about the development of Hohokam culture and the interaction between the Hohokam and the prehistoric Pueblo cultures to the north and east.

The town of Redington is a historic community dating back to the early 20th century. It was settled as a result of the nearby Redfield Ranch, the first area post office.

Recreation Resources

Information regarding the existing recreation pattern in the vicinity of the proposed Buehman Bingham preserve is little known, but it is assumed that hikers and a handful of other recreationists presently use the area. Additional information regarding existing uses will be gathered when the preserve's master plan is prepared.

Four trails listed on the Eastern Pima County Trail System Master Plan are either located within in or pass through the proposed preserve:

- Trail #7 - San Pedro River Corridor
- Trail #49 - Buehman Canyon
- Trail # 50 - Edgar Canyon
- Trail #53 - Redington Road

The San Pedro River Corridor and Buehman Canyon trails are wash corridor trails suitable for hiking and equestrian use. The Edgar Canyon trail is a wash and cross-country trail capable of supporting a non-motorized shared-use pattern (hikers, equestrians, and mountain bicyclists). The Redington Road trail is a road right-of-way trail also suitable for non-motorized shared use. The access pattern for these trails will be subject to the preserve master planning process, which will be oriented towards the protection of sensitive natural and cultural resources.

The Arizona Game and Fish Department authorizes hunting of both big and small game species in this general vicinity noted as Unit 33. Big game species include mule deer, white tailed deer, and javelina. Small game includes cottontail rabbit, dove, quail, and tree squirrel. Redington Pass and Buehman Canyon are especially known for deer hunting. Saguaro National Park does not allow the possession of weapons within its boundaries and is closed to hunting.

Existing Policies

Bingham Cienega Natural Preserve-- The Nature Conservancy, under contract for the Pima County Flood Control District, manages the 285 acre Preserve. The area is not open for recreational use, but can be accessed by appointment.

A-7 Ranch--The City of Tucson recently purchased the Bellota Ranch, now known as the A-7 Ranch. Almost 7,000 acres of the ranch is privately owned and is closed to public use. The remaining ranch is composed of State lease, or Federal lease land which is open to hiking, hunting, mountain biking, and a variety of other recreational uses. Hunters are required to have a valid license during hunts.

Buehman Canyon-- Buehman Canyon is owned and managed by the Nature Conservancy. This area is one of the San Pedro's most significant tributaries providing a valuable environment for

a number of wildlife species. The area is closed to recreational use and may be accessed by permit only.

For information on these and remaining federal reserves, please consult Tables 3 and 4 for public use and resource management policies or consult the managing authority for specific resource management policies.

Potential Management Alternatives

Bingham Cienega Natural Preserve Expansion--Expansion plans for the Bingham Cienega would probably have no effect on management of the reserve. The site will remain closed to recreational activities with an emphasis on education, site enhancement and resource protection.

A-7 Ranch--The A-7 Ranch is managed by a cooperative agreement between the City of Tucson, Nature Conservancy and the Redington Conservation District. One can anticipate the ranch will continue to operate as a working cattle ranch for the foreseeable future; however, keep in mind that State Land can be sold for development purposes and the vast majority of the A-7 Ranch is leased State land.

Buehman-Bingham Natural Preserve-- A Buehman-Bingham Natural Preserve would probably be managed as is the Bingham Cienega Preserve. The site would remain closed to recreation and visitation will be by permit only.

Table 3: Public Use Policies of the Middle San Pedro Subarea

Managing Entity	Reserve Name	Public Use Policies													Comments			
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archer Hunting	Off-Range Plinking	Shooting Range	Fishing		Swimming	Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	R	N	R	NA	R	R	Consult Appropriate Agency
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
Nature Conservancy	Bingham Cienega Natural Preserve	Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	N	Y	N	
The Nature Conservancy	Buehman Canyon and deeded land	Y	R	Y	R	N	Y	Y	R	Y				N	NA	N		
City of Tucson	A-7 Ranch	Y	Y	Y	Y													
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	NA	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Table 4: San Pedro Resource Management Policies

Managing Entity	Reserve Name	Resource Management Policies														Comments					
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.
Varies	Wilderness Areas	R	N	P	N	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	
U.S. Forest Service	Unreserved Coronado	P	Y	Y	Y	P	P	P	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Nature Conservancy	National Forest																				
	Bingham Cienega	N	R	R	R	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	Access only with permission of The Nature Conservancy
The Nature Conservancy	Natural Preserve																				
	Buehman Canyon and deeded land								N												
City of Tucson	A-7 Ranch	N	P																		
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

This chart contains the most accurate information available at the time of printing. For current information, please contact the reserve management.

Opportunities for Reserve Expansion

Bingham Cienega Natural Preserve

The 1997 Open Space Bond Program included \$1,000,000 in funding to facilitate the purchase of an additional 400 acres of land to enhance Pima County's existing 285-acre Bingham Cienega preserve (Project #RW-13) (Figure 29). The Open Space Bond funds will be used to attract additional funding in the form of matching grants, which will maximize the effectiveness of the bond dollars and allow more land to be acquired and protected. The acquisition of additional Bingham Cienega property is a key part of the proposed Buehman-Bingham Natural Preserve (Figure 4).

Buehman - Bingham Natural Preserve

Background -- Assuring a permanent, viable link between the Catalina Mountains and the San Pedro River corridor and the protection of the sensitive plant and wildlife resources that presently exist in this area are the principal purposes of the Sonoran Desert Conservation Concept Plan's proposed 7,489-acre Buehman-Bingham Natural Preserve (see Figure 4). This preserve, located in the San Pedro River Valley in the far northeastern corner of Pima County, could incorporate the 1,080 acres owned by The Nature Conservancy along the eastern boundary of the Santa Catalina Ranger District of the Coronado National Forest in the Buehman Canyon area and Pima County's existing 285-acre Bingham Cienega holding along the San Pedro River. In total, the proposed preserve is composed of 5,004 acres of private property, 2,478 acres of State Trust Land, and 7 acres of federal land.

The specific rationales for the creation of the preserve include enhancing the protection of Buehman Canyon, one of the San Pedro River's most significant tributary canyons, and its delicate wildlife, which includes leopard frogs and two rare southwestern fishes--the Gila topminnow and desert pupfish. The preserve could also provide a protective context for the Bingham Cienega, an oasis for wildlife that supports a variety of rare wetland communities, including marsh, mesquite bosque, velvet ash-hackberry swamp forest, and historically, sacaton grassland. In addition, the preserve would establish an important protected wildlife migration corridor for wide-ranging wildlife species such as the black bear and mountain lion.

A link to the east with nearby Redfield Canyon, which is located along the southern edge of Graham County, would further enhance the preserve's effectiveness as a wildlife corridor. The proposed preserve includes a segment of Unit 6 of the recent critical habitat designation for the cactus ferruginous pygmy owl and habitat for the Huachuca water umbel. In addition, the preserve will protect and enhance regional flood control capacity, and facilitate natural recharge.

Existing Condition -- The Buehman-Bingham natural preserve is located in remote and rural area. Ranching and farming have occurred in the valley for more than 100 years, and are the

traditional staples of the area's economy. While the majority of the San Pedro River corridor is in private ownership, property on both sides of the corridor is State Trust Land.

The potential sale of the Bellota Ranch (now known as the A-7 Ranch) to private interests in 1998 raised the specter of development and future urban sprawl in the San Pedro River Valley, but the subsequent acquisition of the property by the City of Tucson allowed these concerns to dissipate for the time being. The remoteness of the area and the lack of infrastructure and services make it unlikely that large scale development will occur at any time in the near future.

Although not part of the proposed Buehman-Bingham Natural Preserve, the nearby A-7 Ranch is a significant addition to the open space of the San Pedro subarea. At almost 42,000 acres, the ranch is the second largest reserve in the subarea. The vast majority of the A-7 is comprised of land leased from the State of Arizona and the federal government for grazing. A smaller portion along the San Pedro River at the Bellota Farm is held as a conservation easement. The City of Tucson owns 6,828 acres in fee. The A-7 was acquired by the City to provide a grass bank for the Redington Conservation District and the community. Although the majority of the subarea is protected by existing reserves, the presence of water resources and a large amount of State Trust Land leaves the possibility of future development. Several major road corridors pass through the proposed preserve: Redington Road, the San Pedro River Road, and the Benson-Mammoth Highway. The existence of these roads and their likely effect on the preserve's resources will be factored into the new preserve master-planning process.

Concept for the Preserve -- Pima County's preliminary concept for the Buehman-Bingham Natural Preserve is for a protected natural area with controlled access based on the Cienega Creek Natural Preserve model. This approach might be appropriate given the sensitivity of the area's resources, but the development of a formal concept will not occur until additional planning and analysis has been undertaken as part of the Sonoran Desert Conservation planning process. Decisions about the level of public access and other activities will be made at that time.

Natural Resources -- The unifying theme of the proposed Buehman-Bingham Natural Preserve is water--and the invaluable habitat it generates along the two major riparian corridors within its boundaries. The preserve encompasses the majority of Buehman Creek, which flows out of the Santa Catalina Mountains through Buehman Canyon, and a key segment of the 140 mile-long San Pedro River, one of the last remaining free-flowing rivers in the region. The value of Buehman Creek and the San Pedro River are well-recognized. The creek has been designated a *Unique Water of Arizona* by state authorities, and the San Pedro was deemed one of a handful of "Last Great Places" in the Western Hemisphere in 1991 by The Nature Conservancy. Both corridors are home to lush riparian habitat.

The San Pedro corridor encompasses a literal plethora of rare and valuable plant communities. For instance, Pima County's existing 285-acre Bingham Cienega reserve, which abuts the river, contains cienega wetland, palustrine wooded swamp, cottonwood-willow riparian forest, and mesquite bosque. The Huachuca water umbel, a listed endangered species, depends on the



Gale Bundrick

A-7 Ranch Headquarters

San Pedro for survival. The Buehman Canyon corridor is similarly rich in vegetation, and is home to large stands of a variety of trees, including cottonwood, ash, walnut, willow, mesquite, hackberry, oak, sycamore, and juniper.

Riparian species are particularly abundant, and include such high-value inhabitants as leopard frogs (a species of special concern) and a variety of fish, including the longfin dace, desert pupfish, and Gila topminnow. The pupfish and topminnow are both listed endangered species. Over 300 species of birds can be found in the area, two-thirds of which are neotropical migrants. Seldom-seen bird species identified in the area include the western yellow-billed cuckoo, the northern gray hawk, the zone-tailed hawk, and others, including the endangered Southwestern willow flycatcher, which was seen in the Bingham Cienega in 1991. Other wildlife known to frequent the area include coatimundi, black bear, whitetail and mule deer, javelina, bobcat, and ring-tailed cats. As previously mentioned, part of the San Pedro corridor is within the critical habitat designation for the cactus ferruginous pygmy-owl.

Linkages to Other Protected Natural Areas -- One of the key purposes of the proposed Buehman-Bingham Natural Preserve is to establish effectively protected biological linkages between the San Pedro River corridor, Pima County's current Bingham Cienega holding and other nearby protected open space areas. The principal linkage will be between the San Pedro and Buehman Canyon, which, as noted, will incorporate The Nature Conservancy's present 1,080-acre holding, which was donated to the Conservancy by Riley West, Inc. in 1997. This linkage will connect the 262,000-acre Santa Catalina Ranger District of the Coronado National Forest to the San Pedro River and protect a valuable wildlife movement corridor. The proposed preserve also includes a swath of mostly State Trust Land heading east to the convergence of the Pima County/Graham County/Cochise County lines, which will provide a significant part of a linkage to Redfield Canyon and the federal land jurisdictions a few miles inside both Graham and Cochise counties.

The long-term efficacy of Pima County's Buehman-Bingham Natural Preserve would be significantly enhanced if a permanent linkage between the preserve and nearby Redfield Canyon could be established. The link to Redfield Canyon will establish a protected corridor to one of southern Arizona's most biologically-rich areas. The Canyon is located approximately five miles east of the Pima-Graham county line just north of the Graham-Cochise county line, and most of the land between the proposed preserve and the canyon is State Trust Land. The Galiuro Mountains and the 76,317-acre Galiuro Wilderness, the U.S. Bureau of Land Management's 6,600-acre Redfield Canyon Wilderness and Muleshoe Ranch Preserve are also within proximity of the Redfield Canyon and could be potentially be linked to the proposed preserve. Achieving this multi-faceted linkage would also have the beneficial effect of connecting the Coronado National Forest's Santa Catalina and Safford Ranger Districts. The State Trust Lands between the proposed Buehman-Bingham Natural Preserve and Redfield Canyon should be earmarked for protection if the effort to have a certain percentage of State Trust Lands set aside for conservation purposes is ultimately successful.

Applicable Planning Documents

The following documents contain information pertaining to the proposed Buehman-Bingham Natural Preserve and/or the area surrounding the preserve:

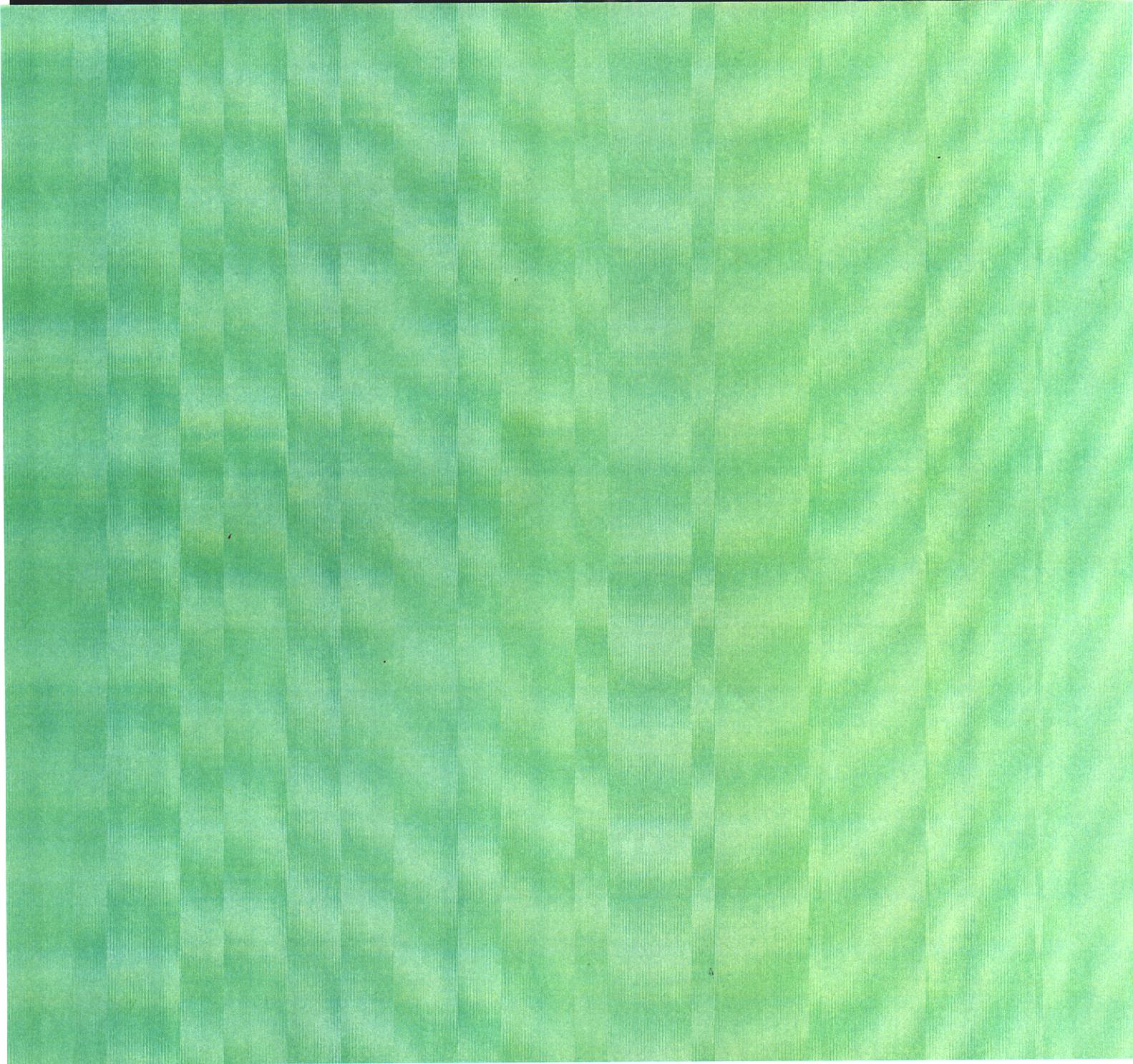
- 1997 Open Space Acquisition Master Plan and Staff Report (2000)
- Pima County Comprehensive Plan (1992)
- Bingham Cienega Management Plan (1992)
- Eastern Pima County Trail System Master Plan (1996)
- Resources of the Middle San Pedro Subarea (2000)

Mountain Parks, Reserves and Biologically Significant Resource Lands

CIENEGA-RINCON SUBAREA

Sonoran Desert Conservation Plan

August 2000



Introduction

The Cienega-Rincon subarea is at the eastern edge of Pima County, extending north from the Santa Cruz County line to the confluence of the Pantano Wash and Rincon Creek (see Figure 7). The subarea is defined by the Santa Rita Mountains to the south, the Rincon Mountains to the north, the Rincon and Cienega Creek valleys, and the Whetstone Mountains on the east. The rugged mountain terrain and river valley support a variety of environmental zones and vegetation types, ranging from the perennial stream of Cienega Creek to the higher elevation evergreen forests in surrounding mountain ranges. Much of the valley is characterized by broad, gently sloping grasslands that extend into the foothills of the mountains.

Historically, land use within this subarea had focused on ranching. The area was rural, with open, undeveloped valleys surrounded by foothills and mountains. While ranching is still an important use, current land use is changing with increasing population pressure. Many ranches have been subdivided and are splitting into smaller parcels. This type of lot splitting and wildcat subdivision have been the most prevalent means of development throughout much of this subarea. The principal settlements are located at Vail, and Mescal. The only urbanized areas are found in the northwest portion of the subarea, adjacent to the eastern edge of the Tucson metropolitan area.

Much of this subarea is located in unincorporated Pima County, except for the area west of Pantano Wash, which has been annexed by the City of Tucson. Land ownership of the area is comprised of federal, state, and private lands, with much of the land publicly owned and protected from development. However, there is a significant amount of State Trust Land south of I-10 which could be sold for private ownership. The establishment of the Las Cienegas National Conservation Area would address many concerns related to increased lot-splitting and development of state land in this subarea.

An important feature in the subarea is Cienega Creek and its tributaries. The Creek headwaters begin near the Pima/Santa Cruz County line with numerous tributaries feeding the creek from the Whetstone and Santa Rita Mountains. Cienega Creek flows through the Empire-Cienega Resource Conservation Area to the Cienega Creek Natural Preserve. Of primary concern in this watershed is the continued presence of surface water in perennial flow areas and cienega marshlands along the Creek. Preserving surface water flow is a priority within existing reserve areas, but could be jeopardized by water rights held by non-reserve entities. Acquiring water rights to protect the perennial flows in the subarea would greatly reduce the potential future stress to biological resources.

Figure 7

Cienega-Rincon

SDCP PLANNING AREA 2

- Major Streets
- Major Washes
- Sub-Area Boundary
- Coronado National Forest
- Saguaro National Park East
- Saguaro National Park East Wilderness Area
- Rincon Mountains Wilderness Area
- Colossal Cave
- Cienega Creek Natural Preserve
- Santa Rita Experimental Range
- Empirita Ranch
- Empire-Cienega RCA
- Mt. Wrightston Wilderness Area
- Wildlife Corridor Links

Pinna County Index Map



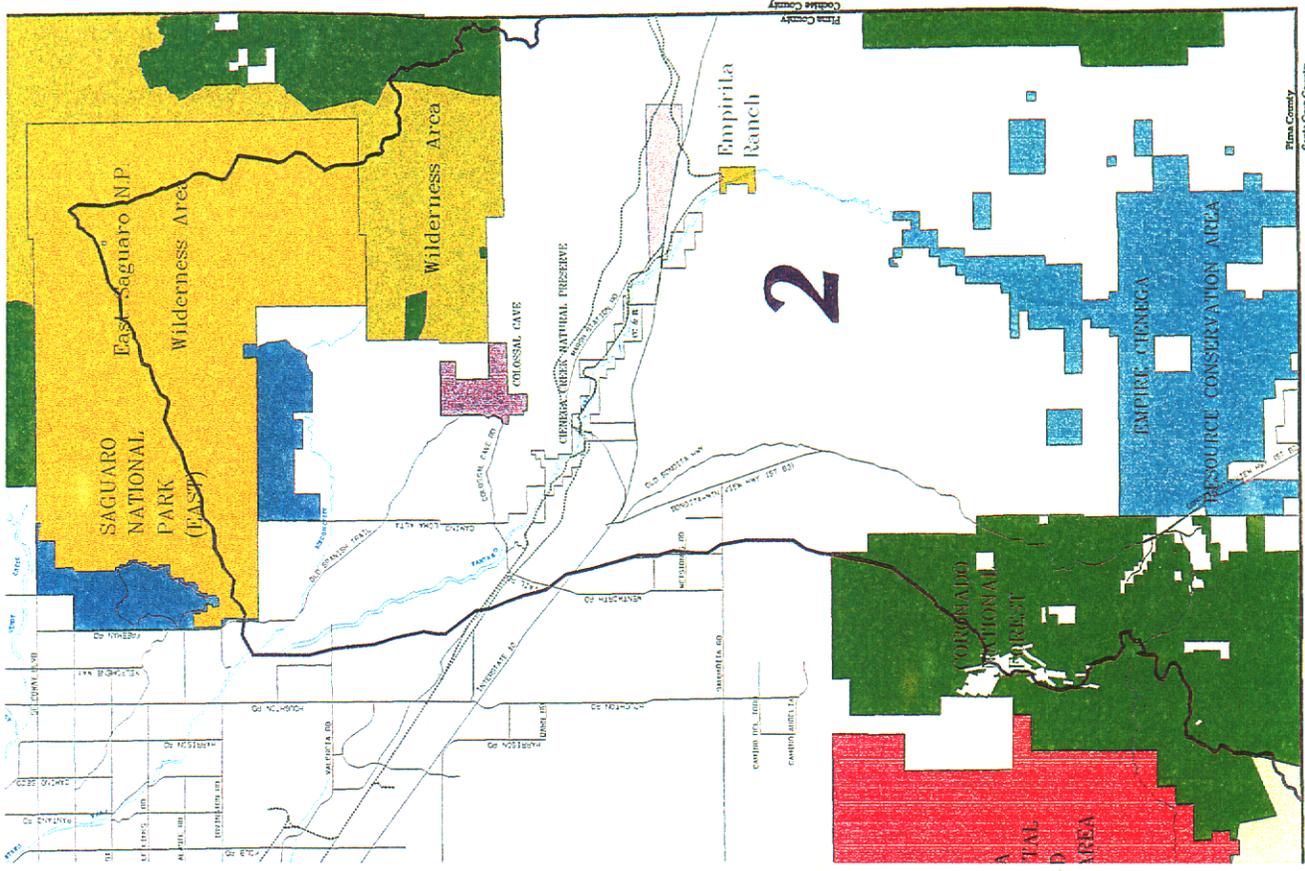
Index Map Scale 1:1,000,000

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ERNES AREA

GAP Status of the Cienega-Rincon Subarea

The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 5).

The Cienega-Rincon subarea has 126,616 acres of reserves, including lands managed by Pima County, the U.S. Forest Service, U.S. National Park Service, and the U.S. Bureau of Land Management (see Table 5). Within this subarea, 39 percent of the land is reserved. Land outside of existing reserves (unreserved Status 4 land), including private, state, or other land, have a total of 191,919 acres.

The addition of 40,721 potential reserve acres (not including the proposed Las Cienegas National Conservation Area) would total 167,337 acres of reserved land, with 52 percent of the Subarea 2 in Status 3b or higher. The remaining 49 percent is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the Multi-species Habitat Conservation Plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 6 lists the priority vulnerable species.

Vulnerable Biological Features

Habitats most at risk include cienega marshlands, riparian gallery forests, crinkle-awn grasslands, oak savannah, sacaton grasslands, healthy highland grasslands, cave habitats, and limestone dependent plant communities. Table 6 lists priority streams and springs found within the subarea.

Potential Stressors

Primary stressors to biological resources in subarea 2 include habitat loss, alteration and degradation, habitat fragmentation, human use and overuse, conversion of ranch lands, and a decline in stream surface flows and competition by invasive species. Palo verde-cacti communities with invasive grasses are at risk of wildfires.

Table 5

Existing Reserves in the Cienega-Rincon Subarea

Land Manager	Existing Reserves	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Pima County	Cienega Creek Natural Preserve	4,105	x					
Pima County Parklands Foundation/Pima County	Colossal Cave Mountain Park	1,896					x	
U.S. Forest Service	Coronado National Forest	41,578					x	
U.S. Park Service	Saguaro National Park (Rincon District) Wilderness	27,527	x					
U.S. Bureau of Land Management	Empire-Cienega Resource Conservation Area	31,884					x	
Pima County	Empirita Ranch	366					x	
U.S. Forest Service	Mt. Wrightson Wilderness	280	x					
U.S. Forest Service	Rincon Mountain Wilderness	14,733	x					
U.S. National Park Service	Saguaro National Park (Rincon District)	4,247		x				
Total Acres of Existing Reserves		126,616						
Total Acres in the Cienega-Rincon Subarea		318,535						

Potential Reserve Expansions in the Cienega-Rincon Subarea

Land Manager*	Potential Reserve Expansions**	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Pima County	Cienega Creek Natural Preserve Expansion	7,293					x	
Pima County	Colossal Cave Mountain Park Expansion	4,814					x	
Pima County	Davidson Canyon Natural Preserve	6,191					x	
Pima County	Santa Rita Mountain Park	10,703					x	
Pima County	Empire Mountain Park (size not yet determined)	11,720					x	
U.S. Bureau of Land Management	Las Cienegas National Conservation Area	206,000					x	
Total acres of Existing and Potential Reserve Expansions***		167,337						
Total Acres of Cienega Rincon Subarea		318,535						

* Managing entities may change with acquisition of the land.

**Until further planning is done, the GAP status of potential reserves cannot be known. It is assumed the level of protection will be 3b or higher.

***Las Cienegas covers parts of Pima and Santa Cruz Counties. The NCA acreage is not included in the Total Acres of Potential Reserves.

Table 6: Cienega-Rincon Priority Vulnerable Species, Streams, and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Cienega Creek (upper)	55 spring locations
	Cienega Creek (lower)	
<i>Idionycteris phyllotis</i> Allen's big-eared bat	Empire Gulch	26 owned by U.S. Forest Service
<i>Lasiurus blossevillii</i> Western red bat	Mattie Canyon	9 owned by U.S. National Park Service
	Wakefield Canyon	8 Privately owned
<i>Leptonycteris curasoae</i> Lesser long-nosed bat	Cinco Canyon	5 on State land
<i>Macrotis californicus</i> California leaf-nosed bat	Davidson Canyon	5 owned by U.S. Bureau of Land
	Posta Quemada Canyon	2 owned by Pima County
<i>Peromyscus merriami</i> Merriam's mouse	Nogales Spring	
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat	Aqua Verde Creek	
	Gardner Canyon	
<i>Aimophila carpalis</i> Rufous-winged sparrow	Rincon Creek	
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	Mescal Arroyo	
	Box Canyon	
<i>Empidonax traillii eximius</i> Southwestern willow flycatcher	Chimineia Canyon	
<i>Pipilo aberti</i> Abert's towhee	Madrona Canyon	
<i>Vireo belli</i> Bell's vireo		
<i>Buteo swainsoni</i> Swainson's hawk		
<i>Glaucidium brasilianum cactorum</i> Cactus ferruginous pygmy-owl		
<i>Terrapene ornata luteola</i> Desert box turtle		
<i>Thamnophis eques megalops</i> Mexican garter snake		
<i>Rana yavapaiensis</i> Lowland leopard frog		
<i>Rana chiricahuensis</i> Chiricahua leopard frog		
<i>Agosia chrysogaster</i> Longfin dace		
<i>Gila intermedia</i> Gila chub		
<i>Poeciliopsis o. occidentalis</i> Gila topminnow		
<i>Albiorix anophthalmus</i> Arkenstone cave pseudoscorpion		
<i>Sonorella sp.</i> Talus snail		
<i>Coryphantha scneeri robustispina</i> Pima pineapple cactus		
<i>Echinomastus e. erectocentrus</i> Needle-spined pineapple cactus		
<i>Lilaeopsis schammeriana recurvata</i> Huachuca water umbel		

Groundwater pumping is a primary concern. Existing water rights, if utilized and maximized, may threaten perennial flows in Cienega Creek. Groundwater pumping is the greatest stressor to perennial streams, cienega marshlands, and springs in the subarea.

Existing Stressors

Activities contributing to stress are ground water pumping, diversion of stream flows, mining, historic overgrazing, increasing urbanization, ORV use, recreational activities, fire suppression and fuel build up, removal of plants, and the introduction and spread of exotic species.

Lot-splitting continues to increase in this area, displacing and fragmenting habitat. Additional private wells associated with growth depletes the aquifer and may affect perennial of Cienega Creek. The potential for future mineral extraction exists in the Santa Rita Mountains, particularly at the north end of Davidson Canyon where interest has already been expressed.

Another concern is increased recreation within the east flank of the Santa Rita Mountains, in the area of Gardner Canyon and north to the Rosemont area. Off-road vehicle use has resulted in habitat loss, erosion, and disturbance of wildlife in this area.

Interstate 10 and SR-83 are the major transportation corridors in the subarea. Other paved roads and numerous unpaved roads are also common throughout the area. The eastbound tracks of the Union Pacific railroad are found here, mainly in alignment with Cienega Creek and I-10. These travel corridors present significant barriers to wildlife movement as well as disturbance associated with increased noise. The Southern Pacific Fuel Line also runs through the preserve. The fuel line may cause environmental contamination should it leak or rupture.

Existing Policies

Cienega Creek Natural Preserve--Cienega Creek Natural Preserve has two Management areas, Zone A and Zone B. For an official designation please consult the Cienega Creek Management Plan Summary (available at Pima County Parks and Recreation Department). Public use of the Preserve is accommodated with the use of a permit system. Three types of permits are available at no fee.

- **Day-Use Permits:** issued for a specific date to individuals and small groups for recreational or educational activities.
- **Special-Use Permits:** Issued for a specific date or period of time to organizations or groups for activities such as trail rides or film making.
- **Multiple-Entry Permits:** Issued for a period of one year to individuals, such as utility company personnel, who must enter the Preserve for periodic inspections or similar activities.

The permit system allows public use of the preserve while accomplishing the following:

- protect the natural and scenic resources of the site;
- protect visitors from natural hazards;
- minimize the need for facility maintenance;
- eliminate conflicts between incompatible uses;
- maintain on-site conditions that allow the public to enjoy a unique outdoor experience.

Colossal Cave Mountain Park -- The Pima County Parklands Foundation charges a fee for public use of the park. The profit generated is used for maintenance, management and capital improvements within the park. The entrance fee entitles visitors to use most of the facilities including trails and picnic sites. The cave tour and specialty rides are not included in the entrance fee.

Potential Management Alternatives

Cienega Creek Natural Preserve -- Due to the sensitive nature of this unique habitat, the following changes might be made within Management Zone A:

- Prohibit dogs from being in the preserve.
- Work with the Arizona Game and Fish Commission to eliminate archery hunting.
- Prohibit equestrian use in the creek bottom between Interstate 10 and Three Bridges

Potential Additions:

- Add a 7-Day Use Permit to allow for easier access

Colossal Cave Mountain Park--

Potential Changes:

- Complete a Management Plan by December 31, 2000.

Table 7: Cienega-Rincon Public Use Policies

Managing Entity	Reserve Name	Public Use Policies														Comments	
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Pinking	Shooting Range	Fishing	Swimming		Dogs On Leash
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	N	R	NA	R	R	R
U.S. Bureau of Land Management (BLM)	Empire-Cienega Resource Conservation Area	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	NA	NA	Y	Y	
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
U.S. Bureau of Land Management	Unreserved BLM	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Pima County Parklands Foundation	Colossal Cave Mountain Park	Y	R	Y	Y	Y	R	R	R	N	N	N	N	NA	Y	Y	Fee Area
Pima County	Cienega Creek Natural Preserve	Y	Y	N	Y	Y	N	N	N	N	N	N	N	NA	Y	Y	Access Permit Required
Pima County	Empirita Ranch	Y	Y	Y	Y	Y	N	N	N	N	N	N	NA	Y	Y	NA	Access Permit Required
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	NA	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Table 8: Cienega-Rincon Resource Policies

Managing Entity	Reserve Name	Resource Management Policies															Comments				
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment	Groundwater Pumping		Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.
Varies	Wilderness Areas	R	N	P	N	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	Y
U.S. Bureau of Land Management (BLM)	Empire-Cienega Resource Conservation Area	R	P	P	P	Y	N	N	Y	Y	N	N	N	N	N	N	N	Y	N	N	Y
U.S. Forest Service	Unreserved Coronado National Forest	P	Y	Y	Y	P	P	P	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
U.S. Bureau of Land Management	Unreserved BLM	P	Y	Y	Y	P	P	P	Y	Y	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pima County Parklands Foundation	Colossal Cave Mountain Park	N	P	P	P	P	P	N	Y	N	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pima County	Cienega Creek Natural Preserve	N	P	P	P	N	N	N	Y	N	N	Y	Y	N	N	N	Y	Y	N	Y	Y
Pima County	Empirita Ranch	P	P	P	P	Y	P	P	Y	N	P	Y	N	N	N	Y	Y	Y	Y	Y	Y
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Existing Reserves

Cienega Creek Natural Preserve

Background -- The Cienega Creek Natural Preserve is a 4,105-acre protected natural area located along a lush and very scenic stretch of the Cienega Creek at the far southeastern corner of the Tucson basin. The preserve begins at Colossal Cave Road and follows the Cienega Creek in a southeasterly direction to its terminus near the headquarters of the Empirita Ranch, a short distance south of Interstate 10. The Preserve encompasses approximately 12 miles of the Cienega Creek, and roughly half of the protected stretch of the creek experiences perennial stream flow. The segment of the Cienega Creek encompassed by the Preserve is highly valued because of its excellent natural condition, the consistent presence of water, and because it represents one of the very few remaining desert riparian areas in southern Arizona. A segment of the creek within the preserve has been designated as a "*Unique Water of Arizona*" because of the significance and quality of the water that flows there. The preserve also includes northernmost mile of Davidson Canyon, a major natural wash corridor approximately 12 miles in length that drains the northeastern foothills of the Santa Rita Mountains, as well as the western portion of the Empire Mountains, and ultimately flows into Cienega Creek. Davidson Canyon is also an important biological corridor that links the Cienega Creek with the Coronado National Forest to the south.

The preserve was established by the Pima County Board of Supervisors, sitting as the Board of Directors of the Pima County Flood Control District, in 1986 for "...the benefit and protection of the County, its resources, residents and visitors." To accomplish this overreaching goal as expressed by the Board, three management objectives were established for the preserve by the staff of the Pima County Flood Control District:

- To preserve and protect the perennial stream flow in Cienega Creek;
- To preserve and protect the natural riparian community along the stream corridor;
- To provide opportunities for public use of the preserve for recreation, education, and other appropriate activities (Cienega Creek Management Plan, page 2-1).

Two other important purposes served by keeping this reach of the Cienega Creek in its existing undiminished state are the facilitation of natural aquifer recharge, and the assistance it offers in lessening the severity of flood events capable of impacting the developed area of the Tucson Basin. The lands within the preserve are in excellent natural condition, and few man-made improvements exist within its boundaries. The most significant of the existing improvements is the Vail Water Company diversion, where the perennial base flows of the river are diverted and carried off the preserve via a pipeline. Transportation corridors include the eastbound track of the Union Pacific railroad, which follows the creek through the preserve; Interstate 10, which crosses the preserve near its southern end; and Marsh Station Road, which crosses the preserve's northern reach at the "Three Bridges" site. The Empirita Ranch is located in the southernmost segment of the preserve and includes several residences, barns and corrals. No



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Cienega Creek Natural Preserve

future improvements are planned for the preserve, although a segment of the 780-mile, cross-state Arizona Trail is expected to be sited nearby.

Because the existing Cienega Creek Natural Preserve has several gaps in its length, funding was included in the 1997 Open Space Bond Program to help link the county's existing Cienega Creek holdings and establish a continuous unit. \$1.4 million was earmarked in the program to facilitate the acquisition of the parcels needed to connect the preserve, and, if funding was sufficient, to enhance it further. In addition, \$1.2 million was included in the Open Space Bond to acquire the section of the Agua Verde Creek between Colossal Cave Mountain Park and the Cienega Creek Natural Preserve.

The Sonoran Desert Conservation Concept Plan recognizes the fundamental role of preserves like Cienega Creek in the achievement of Pima County's conservation goals, and proposes that the unit be expanded by approximately 7,293 acres of adjacent lands to enhance its ability to fulfill its resource protection and flood control mission. The proposed expansion would bring the total amount of land within the preserve to 11,398 acres. A map that shows the county's existing holdings within the preserve and the proposed expansion area is on the following page.

The proposed expansion of the Cienega Creek Natural Preserve has several distinct purposes. First, the expansion would assure perennial stream flows continue through the preserve, that the gaps that presently exist within the preserve are filled, and that the creek is encompassed by a corridor wide enough to assure its protection (the creek is located very close to the existing preserve boundary in several locations).

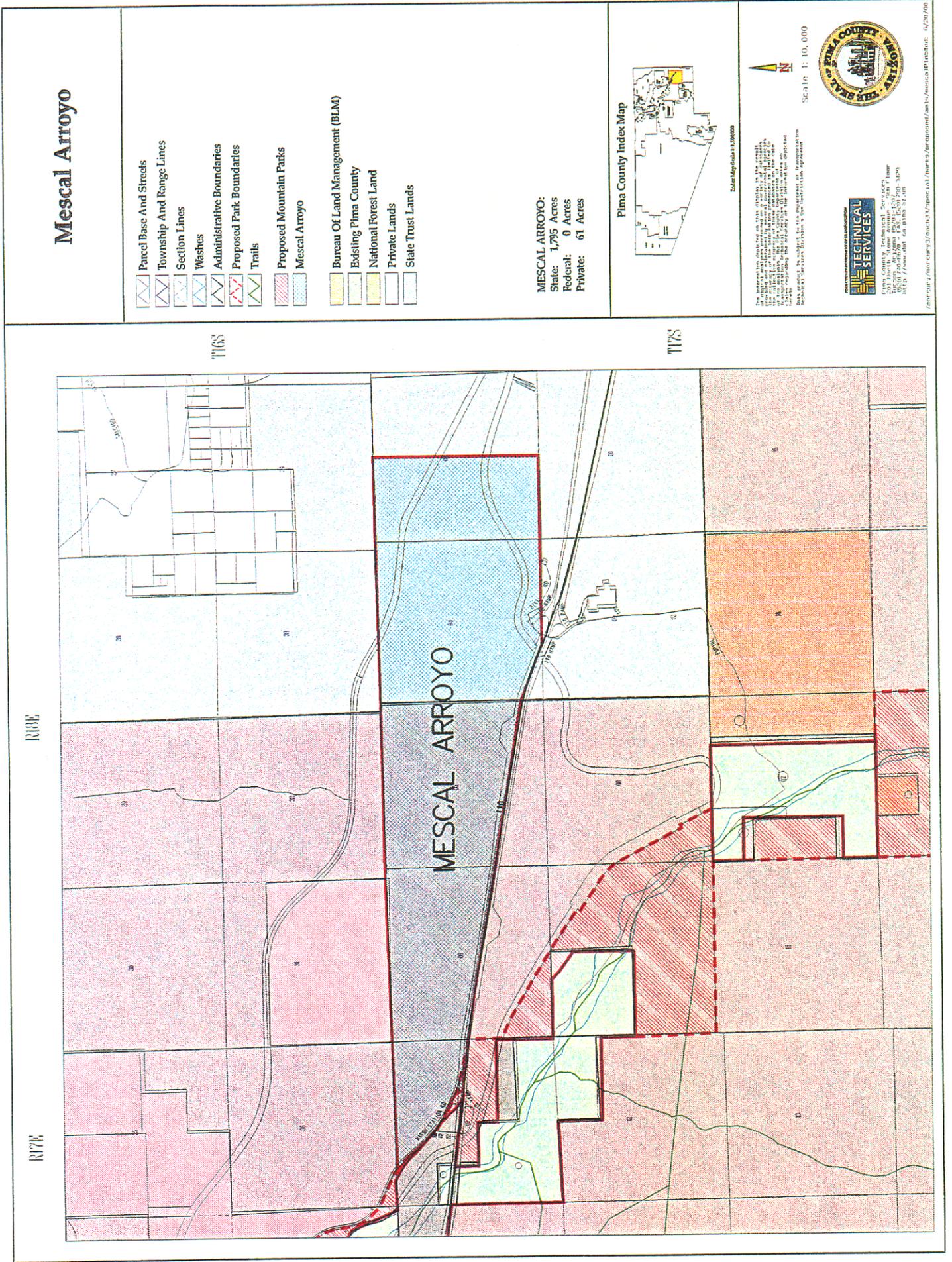
Second, the expansion would facilitate the linkage of the preserve to other nearby open space areas. The preserve would be connected to Pima County's proposed Davidson Canyon Natural Preserve, the BLM's Empire-Cienega Resource Conservation Area, and the county's Colossal Cave Mountain Park. These important linkages would help build a permanent connection between the Nogales Ranger District and Santa Catalina Ranger District of the Coronado National Forest and the federally-designated wilderness areas within them.

Finally, the enhancement would shield additional riparian habitat, further protecting what has become a very rare resource in the desert southwest, and also protect significant upland habitat adjacent to the preserve.

An adjunct to the expansion of the Preserve is the protection of the Mescal Arroyo (Figure 9), which links with the Cienega Creek. The Mescal Arroyo is located east of the preserve and immediately north of Interstate 10. The Sonoran Desert Conservation Concept Plan proposes conservation of 1,856 acres of State Trust Land surrounding the Arroyo to ensure its protection and provide a perpetual connection to Cienega Creek.

The majority of the Cienega Creek Natural Preserve and its proposed expansion area is located within the recently-proposed Las Cienegas National Conservation Area (NCA). The purpose of

Figure 9



the Las Cienegas NCA is to help conserve the Cienega Creek watershed, and its creation would play a major role in the protection of the region's sensitive and valuable natural resources. The NCA would also facilitate the conservation of the large quantity of range lands south of I-10, protecting scenic values and providing a variety of recreation opportunities.

Existing Condition -- Like the nearby Colossal Cave Mountain Park, the Cienega Creek Natural Preserve was, until recently a rural preserve, with only the small community of Vail and a few scattered homes in its vicinity. The rural character of the Vail area began to change in the latter half of the 1990s, with the construction of manufactured home developments along Colossal Cave Road, and more recently, the implementation of the 1,700-acre Vail Valley Ranch subdivision, which will be located immediately north of Colossal Cave Road east of the Pantano Wash and will include a golf course and single-family homes.

Other significantly-sized developments are in the planning stages, and a considerable change in the nature of the area is expected over the next 10 years as pending projects are constructed and new projects are approved. Of particular significance to the preserve is a manufactured home development recently approved for the area south of Colossal Cave Road along the western side of the preserve. This development will entail the construction of a large number of dwelling units, all of which will use septic tanks for waste disposal. Concern has been expressed by Pima County staff that leakage from existing and proposed septic systems could negatively impact the preserve. Also of concern is the level of groundwater pumping in the area, which has the potential for seriously compromising the natural values of the preserve. It is clear that protecting the Cienega Creek Natural Preserve and its sensitive and irreplaceable natural resources will require a high degree of vigilance and managerial oversight as these projects are implemented and the surrounding area continues to grow. With development continuing and land values rising in the region, the acquisition of Cienega Creek-area parcels identified in the 1997 Open Space Bond Program in a timely manner becomes increasingly important, as does the creation of the biological corridors between the preserve and other nearby open space units identified in the Sonoran Desert Conservation Concept Plan.

The Empirita Ranch management zone of the Cienega Creek Natural Preserve lies south of Interstate Highway 10. Significant vegetation resources of this area include sacaton grassland and Chihuahuan desert scrub. There is no perennial flow. The natural and physical resources are currently managed for the Pima County Flood Control District through a five year caretaker agreement with the Parsons Company. Access is permitted through the Parks and Recreation Department.

Preserve Concept -- The Cienega Creek Natural Preserve was created to protect and preserve a highly valuable segment of the Cienega Creek riparian corridor and its inherent natural values, and resource protection is the preserve's first priority. Consistent with this purpose, the preserve is maintained as close to its natural state as possible, and only activities that do not degrade its natural, scenic and cultural resources are accommodated. The total amount of public access to the preserve is limited to ensure that its resources are adequately protected. Pima County presently allows a maximum of 50 people per day into the preserve, and permits

are required to gain access. Day-use permits are available at no cost from the Pima County Parks and Recreation Department. Activities presently allowed within the Cienega Creek Natural Preserve include hiking, walking, backpacking and picnicking and similar activities. Horseback riding and mountain biking were also identified for accommodation within the preserve, but only on designated trails outside the creek corridor. Activities expressly prohibited within the preserve include fuelwood harvesting, and the destruction, disturbance, of archaeological and historical sites, the collection of artifacts, and the harvesting or removal of plants, seeds, or plant parts, except as authorized by the County (refer to Tables 3 and 4).

Natural Resources -- The Cienega Creek Natural Preserve is noted for the outstanding quality and variety of the natural resources contained within it. The riparian nature of the preserve area is notable because of the exceptional biodiversity it offers, and also because riparian areas have become extremely scarce in southern Arizona. Another significant characteristic is the wide variety of plant associations that can be found within the preserve area. The preserve is located within a transitional zone between the Sonoran and Chihuahuan Deserts and thus exhibits some of the features of each region, is home to nine plant associations. These associations include:

- Mixed Grass - Mixed Scrub Association (2%)
- Burroweed - Mesquite Association (5%)
- Creosote - Mariola Association (12%)
- Ocotillo - Mixed Scrub Association (1%)
- Creosote Association (9%)
- Creosote - Mixed Scrub Association (14%)
- Velvet Mesquite Association (20%)
- Velvet Mesquite - Mixed Deciduous Tree Association (4%)
- Velvet Mesquite - Mixed Scrub Association (21%)

The remaining 12% of the Preserve not included in one of the plant communities listed above consists of abandoned ag. fields (4%) and bedrock/sandy wash channel (8%).

The visual and biological characteristics of these wide-ranging plant communities are distinctly different, and their presence within a small geographical area is very rare and unique (Cienega Creek Management Plan, 1994). Pima County staff are not aware of any special status plant species within the reserve. However, two special status plants are known to occur in the area, and the possibility exists that these plants may exist in the preserve and/or on the preserve's adjacent expansion lands identified in the Sonoran Desert Conservation Concept Plan. These two species are the Needle-Spined Pineapple Cactus and the Pima Pineapple Cactus. The Pima Pineapple Cactus is a listed endangered species. Two principal types of wildlife habitat exist within the existing boundary of the preserve and on its surrounding expansion lands--those associated with the preserve's riparian areas, and those associated with its upland areas. The more significant of the two are the habitats associated with the preserve's riparian areas, because of the high level of biological productivity and species diversity they foster. The

preserve's riparian habitats have local, state and national significance. The Cienega's riparian area was designated Class 1 habitat in Pima County in 1986, when it was identified as "...some of the best and most valuable habitat in the Tucson metropolitan area." Under the Arizona Game and Fish Department's habitat classification system, the habitats are designated as Resource Category I because they were determined to be "...of highest value to Arizona wildlife species and are unique and/or irreplaceable on a statewide or eco-regional basis." In addition, per the U.S. Fish and Wildlife Service classification system, the habitat falls into Category 2 for being "...relatively scarce on a national basis or in the eco-regional section." As a result of its quality, the preserve's wildlife habitat sustains a diverse and large population of mammals, birds, fish, reptiles, amphibians, and invertebrates. Two special status species are known to exist in the preserve: the lowland leopard frog and the Mexican garter snake. Other special status species may also be present in the preserve: the Mexican long-tongued bat, the Gila chub, the Gila topminnow, the lesser long-nosed bat, and the Sonoran desert tortoise.

Cultural Resources -- The lands in and around the Cienega Creek Natural Preserve have been the focus of considerable human activity for an estimated 10,000 years, and as a result are very significant from a cultural resource perspective. While no Paleo-Indian archeological sites are known to exist in the Preserve, remains of a mammoth and scattered artifacts found in the area suggest that sites from this period may ultimately be found there. A number of Hohokam villages and agricultural fields are located within the preserve and cover a time period from the Archaic era to approximately the 1400s. Little is known about the time period from 1400 to 1800, but the frequency of use of the area began to increase considerably when a Butterfield stagecoach line and its "Cienega Station" were developed along the creek in the late 1850s. Several ranches were established in the area in the years that followed, and the first Southern Pacific Railroad line was completed in 1880. The community of Pantano was established in the 1880s to serve as a stop on the rail line, and continued to exist until the early 1950s. The remnants of the Pantano Townsite are located within the boundaries of the existing preserve.

Recreation Potential -- The Cienega Creek Natural Preserve's lush vegetation and scenic values, clean running water, outstanding mountain vistas, and sense of solitude and natural quiet make it a very attractive place to visit. However, because resource protection is the principal imperative in the preserve, recreational activities are limited to those that do not adversely impact its sensitive resources. Considerable attention was applied to this matter during the development of the preserve's management plan in 1994, and the following recreational activities were determined to be compatible with the mission of the unit:

- Hiking, walking, backpacking, picnicking and related activities;
- Railroad train watching, photography and painting;
- Non-intrusive bird and wildlife observation, photography and painting;
- Wading in the creek's pools and stream;
- Scientific research and environmental education;
- Other non-consumptive recreational or educational activities.

Horseback riding and mountain biking are restricted to designated trails outside the creek corridor (which have yet to be developed), and hunting, fishing and related activities in the preserve are subject to the rules and regulations published annually by the Arizona Game and Fish Department. Motorized vehicles, livestock grazing, camping and other overnight activities, campfires, fuelwood harvesting, and the destruction, disturbance, harvesting or removal of plants, seeds and plant parts are strictly forbidden.

Access is limited to 50 people per day, and a permit is required to enter the preserve. Permits are available at no cost from the Pima County Parks and Recreation Department. Presently about 10 people per weekday visit the Cienega Creek Natural Preserve. Visitation numbers are higher on weekends, particularly cooler weekends and holidays in the fall, winter and spring, when the maximum number of 50 visitors per day is often reached.

Several trails listed on the Eastern Pima County Trail System Master Plan link with the preserve, including:

- Trail #58-Lower Agua Verde Creek
- Trail #63-Total Wreck Wash and Trail
- Trail #74-Davidson Canyon
- Trail #251-Gas-Power West
- Trail #252-Gas-Power Middle
- Trail #253- Gas-Power East
- Trail #278-Gas Pipeline Trail

In addition to the trails listed above, a segment of the Arizona Trail will be sited along or through a portion of the preserve. The exact route of the Arizona Trail has yet to be determined; field work to identify an appropriate alignment is now underway. Consistent with its statewide use pattern, the portion of the Arizona Trail passing through Pima County will support a non-motorized shared-use pattern -- i.e. hikers, equestrians, and mountain bicyclists. The expansion lands slated for addition to the preserve under the Sonoran Desert Conservation Concept Plan will help protect these Master Plan-listed recreational trail corridors and assist with the siting of the Arizona Trail.

Colossal Cave Mountain Park

Background -- The 1,895-acre Colossal Cave Mountain Park was formally established in 1992, and is the most recent of the three mountain parks in the Pima County Mountain Park and Natural Preserve System. The park, located at the picturesque southwestern corner of the Rincon Mountains approximately 1.5 miles north of the Cienega Creek Natural Preserve, is best known for the tourist attraction from which it draws its name.

However, this underappreciated natural park has considerably more than just its cave to offer. The park's scenic values are exceptional, and its variety of features include 2.5 miles of trails open to hikers and equestrians, picnic and camp sites, a public stable, and a lush segment of the Posta Quemada Wash. The park will also host a future segment of the Arizona Trail.

Pima County has had a presence at Colossal Cave since 1944, when it leased 495 acres that included the cave from the Arizona State Land Department for the purpose of establishing a public park. The local appreciation of Colossal Cave, however, date back to the late 1870s, when local residents of the Old Pueblo began making treks from town to explore the "Arizona Catacombs." In 1922, Tucsonan Frank Schmidt filed two mining claims on the cave property. Mr. Schmidt began leading tours into the then-unimproved Cave in 1923, and this fascinating natural feature has been one of Pima County's leading attractions ever since.

From 1934 to 1938, the CCC constructed the park's headquarters buildings and built walkways and handrails inside the cave. In 1956, Pima County leased the entirety of the park to Joe Maierhauser, who operated it continuously until 1992. The creation of Colossal Cave Mountain Park began in 1989, when Pima County acquired 470 acres of property, including the La Posta Quemada Ranch headquarters, from an Ohio investment consortium for \$2,500,000.

An additional 116.4 acres were purchased in 1989 from Green Fields School. In late 1991, Pima County purchased the original 495 acres of lease lands from the State Land Department along with an additional 718.61 acres of State Trust Land, which set the stage for the creation of the mountain park in 1992.

According to the Colossal Cave Mountain Park Master Plan Background Report, Pima County had three principal reasons for establishing the mountain park: "First, that the Park establish a contiguous link to the Coronado National Forest and Saguaro National Park. Second, that the park provide recreational opportunities and natural resource experiences to the population of the Tucson Basin. And third, that the Park preserve the ecological, historical, archeological and recreational value of the land from the pressures of regional growth and development in the area." (Colossal Cave Mountain Park Master Plan Background Report).

Since 1992, Colossal Cave Mountain Park has been administered by the Pima County Parklands Foundation under the supervision of the Pima County Parks and Recreation



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Colossal Cave Mountain Park

Department. Joe Maierhauser, who has been active at the cave since 1956, manages the mountain park for the Parklands Foundation.

The Sonoran Desert Conservation Concept Plan recognizes the outstanding natural resource values that exist within this park and its important role in the regional open space network, and has proposed that the existing 1,896 acre park be expanded by approximately 4,814 acres. The expansion of the park is intended to accomplish four principal goals:

- Protecting key segments of the southern and southwestern slopes of the Rincon Mountains, including the adjacent Pistol Hill, and the presently unimpacted viewshed they comprise;
- Establishing a linkage between the park and the Coronado National Forest in accordance with the original intent of the creation of the mountain park, which will entail the acquisition of several key parcels of private property;
- Establishment of a linkage between the mountain park and the county's Cienega Creek Natural Preserve, which will create an important biological corridor between the preserve and the Santa Catalina District of the Coronado National Forest, and provide an crucial link in the regional open space network.
- Protecting significant upland and riparian Sonoran Desert habitat, including additional segments of the Agua Verde Creek and Posta Quemada Wash.

Of the 4,814 acres in the proposed expansion area for the park, 3,319 acres is State Trust Land, 1,477 acres is private property, and 18 acres is federally-owned. If Pima County is able to acquire expansion lands as proposed, the park would encompass a total of 6,710 acres.

In addition to the expansion of Colossal Cave Mountain Park proposed in the Sonoran Desert Conservation Concept Plan, a complementary proposal has been made by the Rincon Institute that would entail the further expansion of Colossal Cave Mountain Park north and west into the Rincon Valley and east along the southern boundary of the Coronado National Forest.

The Institute's proposal suggests the addition of approximately 14,160 acres to the expansion area suggested by the Sonoran Desert Conservation Concept Plan. It would include a large parcel of Arizona State Trust Land located between the southern boundary of the Rincon Mountain District Expansion Area of Saguaro National Park and Colossal Cave Mountain Park, as well as State Trust Lands east of the park and south of the Coronado National Forest encompassing a key segment of the Agua Verde Creek.

The benefits to be derived from the Institute's proposed expansion include the protection of large tracts of scenic, unspoiled desert with excellent quality habitat, the facilitation of a direct link between Colossal Cave Mountain Park and Saguaro National Park, and the protection of two important segments of the Rincon Creek and Agua Verde Creek. The enhanced expansion

area would also provide a protected corridor for the Rincon Valley segment of the 780-mile, cross-state Arizona Trail, which passes through both Saguaro National Park and Colossal Cave Mountain Park.

In 1997, work began on master plan for Colossal Cave Mountain Park. A working group was formed, and completed a comprehensive Master Plan Background Report in March of 1998. The information included in the Background Report will help guide the development and management of the park for many years to come.

Colossal Cave Mountain Park and its proposed expansion areas are located within the proposed Las Cienegas National Conservation Area, the concept for which grew out of ideas first proposed in the late 1980s. The current proposal is much more extensive than previous iterations of the concept, and Pima County is hopeful that this designation will bring funding that can be used to expand Colossal Cave Mountain Park and the Cienega Creek Natural Preserve, as well as the principal focus of the NCA project, the BLM's Empire-Cienega Resource Conservation Area.

Existing Conditions -- The character of Colossal Cave Mountain Park's setting remains essentially rural, but the surrounding area is poised for significant change. While the park is not beginning to feel the effects of encroachment like the northern reach of the Cienega Creek Natural Preserve, development is occurring just a few short miles to the west down Colossal Cave Road, and a new access road and several homesites have been cleared on the northern boundary of the park on a parcel of private property included within the park's proposed expansion boundary. Add to these factors the approved and pending subdivision and specific plans that will completely change the character of the Rincon Valley--Rocking K Ranch, Coyote Creek, Mountain Creek Ranch, Antler Crest, Vail Valley Ranch and others--and it is clear that the park and the rural area that surrounds it will soon be entering a major transition period.

The mounting development pressure in the region argues for an effective and balanced land conservation strategy.

Park Concept -- The concept for Colossal Cave Mountain Park essentially mirrors that of Tucson Mountain Park, but on a much smaller scale. The proposed expansion of the land component of the park would protect and preserve a large quantity of natural open space, while the original core of the park will more closely resemble the parts of Tucson Mountain Park that are home to the Arizona-Sonora Desert Museum and Old Tucson. Colossal Cave's rough equivalents to those features are Colossal Cave and the Posta Quemada Ranch.

An expansion of the Colossal Cave compound is not anticipated, but its Depression-era CCC-constructed buildings will be restored using funds from the historic preservation component of the 1997 Open Space Bond Program. However, additional development is slated for the Posta Quemada Ranch compound, which will receive a new parking area, and several small park structures, including living quarters for park staff, a tack room, a woodworking shop, and more. Like Tucson Mountain Park, Colossal Cave Mountain Park offers low-intensity

recreational trail opportunities for hikers, equestrians and bicyclists, as well as picnicking and camping sites. A segment of the Arizona Trail that serves all three user groups will pass through the park on its way to the Mexican border.

Natural Resources -- As might be expected from a park that features a natural cave, the geology of Colossal Cave Mountain Park is extraordinary, and is undoubtedly its most significant characteristic. According to experts who have conducted studies on the site, the park's geology is uncommonly diverse, and represents a "mosaic" array of 20 different geologic units. The park is regarded as one of the few sites in the region where "...visitors can view, in close proximity to one another, rock units representing the entire span of geologic time in southern Arizona, as well as evidence of the physical changes that accompanied geologic events." The proposed expansion of the park will help protect additional outstanding unimpacted examples of this geologic diversity, further contributing to the significance of the park. (Colossal Cave Mountain Park Master Plan Background Report).

Colossal Cave Mountain Park is also notable for its wide range of vegetative communities. This exceptional diversity can be attributed to its variety of rock and soil types (21 soil types occur within the park's planning area), as well as to the fact that the park is located in a transition area between the Chihuahuan and Sonoran deserts, and includes some of the characteristics of both regions. The park's higher than average rainfall also contributes to this diversity.

Six vegetative communities have been identified within the park's planning area, including the Creosote Bush, Palo Verde-Saguaro, Chihuahuan Desertscrub, Semidesert Grassland, Deciduous Riparian Forest, and Evergreen Woodland associations. These plant communities are generally in very good natural condition, although several exotic species can be found within the park. Park staff is aware of the existence of the exotics and the measures necessary for their control.

Special status wildlife species that are known to occur in the park include the desert tortoise, the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, the California leaf-nosed bat, the western red bat, and Townsend's big-eared bat. No special status plant species have been identified in the park, though nine crestate saguaros are found in the park.

The uncommon diversity of the park's plant communities in turn fosters considerable wildlife diversity. For instance, the small, hearty woodland riparian area on the La Posta Quemada Ranch provides habitat for a wildlife community unto itself, and the Chihuahuan and Sonoran habitats support species of their own.

Three general habitat types can be found within the park:

- (1) habitat associated with cave features;
- (2) upland habitat, and
- (3) riparian habitat.

The latter two are also found on the proposed expansion lands within the planning boundary. The species that inhabit the park range from predatory mammals such as ringtail cats and mountain lions to at least 11 species of bats. The park is especially diverse in bird and reptile species, at least partly owing to the lush riparian habitat in the Posta Quemada Wash and along the nearby Agua Verde Creek.

Cultural Resources -- Colossal Cave and the area surrounding it, including the suggested expansion lands, have considerable archeological and historical significance. The lands, with natural springs and riparian corridors, have long attracted the interest of humans and were inhabited for an extended period. To date, 13 prehistoric sites have been identified in vicinity of the park and the adjacent Pistol Hill area. The area in and around the park has also been hub of human activity since the mid-1800s. In 1857, the first stagecoach line passed through the area, and by the 1870s, the Southern Pacific Mail and Transportation Company was operating a stagecoach stop on what is today a part of the Posta Quemada Ranch. In 1879, rancher Solomon Lick discovered what is now Colossal Cave while searching for stray cows, and initiated local interest in this unique feature that continues today.

In 1923, the first tours of the unimproved cave began, led by Frank Schmidt. In 1934, the CCC established a camp at the park on the adjoining Posta Quemada Ranch, and started work on a variety of park features. By the time the CCC camp closed in 1938, CCC workers had constructed pathways, handrails and lighting inside Colossal Cave, adobe camp structures on the Posta Quemada Ranch, roads, campgrounds, ramadas, and stone walls in the park, as well as the park's headquarters buildings. These outstanding features of the Depression Era and the overwhelming historical value of the park led to its inclusion in the National Register of Historic Places in 1992. Including the 13 prehistoric archeological sites in and around the park, a total of 27 cultural resources sites have been recognized by the Arizona State Museum.

Recreation Potential -- Colossal Cave Mountain Park presently offers a wide range of passive recreation opportunities, including picnicking, birdwatching, hiking, horseback riding and camping. The park's 2.5-mile internal trail system is presently open to hikers and equestrians, although this trail use pattern will broaden to include mountain bicyclists when the park's segment of the shared-use Arizona Trail has been implemented. Eight trails listed on the Eastern Pima County Trail System Master Plan pass through the park, its proposed Sonoran Desert Conservation Plan expansion area, or the vicinity of both. These trails include:

- Trail #55 - Cienega Creek
- Trail #58 - Agua Verde Creek
- Trail #61 - Posta Quemada Canyon
- Trail #64 - Colossal Cave Road
- Trail #67 - Old Spanish Trail
- Trail #68 - Pistol Hill Road
- Trail #72 - X-9 Ranch Road
- Trail #246 - Coyote Wash

In addition to the Master Plan-listed trails, the park will also host a segment of the 780-mile, cross-state Arizona Trail, which is not presently listed on the Trails Master Plan because its ultimate route is still being determined. Field work to identify an alignment for the Arizona Trail through the park began in the spring of 1999, and a route should be fully identified by September, 1999. Two trailhead staging areas will provide access to the Arizona Trail in the vicinity of the park as well as the park's internal trail system. One of the trailheads will be located in the vicinity of the Posta Quemada Ranch, and the other will be located north of the park along Pistol Hill Road.

Linkages to Other Protected Natural Areas -- Two principal linkages to other protected natural areas have been identified through the park's master planning process and the development of the Sonoran Desert Conservation Concept Plan -- the linkage east to the Coronado National Forest, and the linkage south to the Cienega Creek Natural Preserve.

Connecting Colossal Cave Mountain Park to the Santa Catalina Ranger District of the Coronado National Forest has been an imperative of the managers of the park and Pima County staff for many years.

Securing this linkage will require several parcels of private property, and while the will to acquire the land has always been present, the money to do so has not. The 1997 Open Space Bond Program did not include funding to facilitate the purchase of these parcels; however, efforts to identify other sources of funding are underway, and will be tapped if an opportunity arises.

Just as important as the linkage to the Coronado National Forest is the park's linkage to the Cienega Creek Natural Preserve. As noted elsewhere in this staff report, this link is part of a series of connections that could create an unbroken chain joining the Santa Catalina Ranger District of the Coronado National Forest and Colossal Cave Mountain Park with the Cienega Creek Natural Preserve, the Davidson Canyon Natural Preserve, the proposed Santa Rita Mountain Park, and the Nogales Ranger District of the Coronado National Forest.

If the Cienega Creek Natural Preserve is expanded to the south as proposed, the park would also be linked to the BLM's Empire-Cienega Resource Conservation Area. Achieving these linkages would be a major success that would benefit each natural area and the regional open space network considerably.

Another significant linkage that has been proposed as an adjunct to the planning process for the Sonoran Desert Conservation Plan is the connection proposed by the Rincon Institute between Saguaro National Park's Rincon Mountain District Expansion Area and Colossal Cave Mountain Park. As noted, this proposal entails the addition of a large quantity of State Trust Land in the Rincon Valley to the park, as well as the acquisition of a segment of the Agua Verde Creek, and would facilitate the creation of an important biological corridor that, like the other linkages noted in this section, would benefit all of the open space preserves in the area.



John Dell

Colossal Cave Mountain Park

Opportunities for Protection

Cienega Creek expansion

The proposed 7,293 acre expansion to Cienega Creek would bring it to a total of 11,398 acres. Several purposes are filled by the expansion of the preserve. Primarily, the expansion would allow perennial stream flow to continue through the preserve, shielding additional riparian habitat, and further protecting a valuable resource. The expansion would also enhance flood control ability.

Linkages to Other Protected Natural Areas -- The implementation of the Sonoran Desert Conservation Plan could facilitate the linkage of the Cienega Creek Natural Preserve to several other public land jurisdictions in the region. Linkages would allow the creation of protected biological corridors that will help assure the viability of the natural resources contained within the Preserve and the protected open space that surrounds it. These linkages include:

- ▶ (1) Davidson Canyon and Santa Rita Mountain Park. The Cienega Creek Natural Preserve already includes the northernmost mile of Davidson Canyon, and the expansion of the preserve would add land to both sides of the existing holding. This expansion would connect with the proposed Davidson Canyon Natural Preserve and provide a broader (one mile wide) link between the Cienega and Davidson Canyon. The 10-mile long proposed Davidson Canyon Preserve connects with the county's proposed Santa Rita Mountain Park and the Nogales Ranger District of the Coronado National Forest at its southern end, thus linking the Santa Rita Mountains with the Cienega Creek Natural Preserve.
- ▶ (2) Colossal Cave Mountain Park. The Sonoran Desert Conservation Concept Plan also proposes to expand the preserve northward to establish a linkage with Colossal Cave Mountain Park. This linkage is a natural because both units are owned by Pima County, and efforts are currently underway to establish part of this linkage by acquiring the Agua Verde Creek Corridor (Open Space Bond Project #RW-12). The proposed link between the park and the preserve would create a protected corridor 1.5 miles in width, which would allow wildlife to move between the southern foothills of the Rincon Mountains and the creek. If Colossal Cave Mountain Park is connected with the Coronado National Forest, then a protected corridor could be established between the forest and the Cienega Creek Natural Preserve. Then, if the Davidson Canyon Natural Preserve and its connections are established, an effective linkage between the Santa Rita and the Rincon Mountains -- and the two districts of the forest -- will have been created.
- ▶ (3) Empire-Cienega Resource Conservation Area. Linking the southern end of the Cienega Creek Preserve to the northern part of the BLM's 31,884-acre Empire-Cienega Resource Conservation Area (RCA) may be the most eagerly anticipated of these three proposed connections, because many in the community have hoped to achieve this goal

since the Empire-Cienega RCA was created in 1988. This link entails the acquisition of approximately 4 additional miles of the Cienega Creek corridor south of Interstate 10 from the Arizona State Land Department, and would facilitate the establishment of a continuous body of protected open space from northern Santa Cruz County to the Rincon Mountains in Pima County. The project, which is located within the proposed Las Cienegas National Conservation Area, would secure a much-desired permanent connection between the wildlife populations on the RCA and within the Cienega Creek Preserve.

Implementation -- Implementation of the Cienega Creek Natural Preserve began in 1986 when the unit was formally established by the Pima County Board of Supervisors. In 1993, the landscape architecture and planning firm of McGann and Associates was hired by Pima County to develop a Management Plan for the preserve. The plan was completed in 1994, and may be updated as part of the Sonoran Desert Conservation Plan.

The importance of the preserve in the County's regional open space network led to the inclusion of funding in the 1997 Open Space Bond Program to fill existing gaps in the unit and facilitate its expansion. The Open Space Bond earmarked a total of \$1.4 million for the Preserve, which is scheduled to become available after FY2003/04. Also included in the Open Space Bond Program was \$1.2 million to acquire the Agua Verde Creek corridor between Colossal Cave Mountain Park and the Cienega Creek Natural Preserve.

Negotiations to purchase some of the Agua Verde Creek property included in the bond program have been underway since 1998, and are nearing fruition.

Colossal Cave Mountain Park Expansion

The Sonoran Desert Concept Plan has proposed that the 1,896 acre park be expanded to over 6,710 acres. Four principal goals would be achieved by this expansion:

- Protection of key segments of southern and southwestern slopes of the Rincon Mountains, including Pistol Hill;
- Establishment of a linkage between the park and the Coronado National Forest;
- Establishment of a linkage between the park and Cienega Creek NP, which will create an important biological corridor between the preserve and Coronado National Forest, providing a crucial link in the open space network;
- Protection of significant upland and riparian Sonoran Desert habitat, including additional segments of the Agua Verde creek and Posta Quemada Wash.

The most significant characteristic of the park is the park's geology, which includes 20 different geologic units. In the vicinity of the park, private and state lands are rapidly being developed by lot-splitting. This puts limestone areas containing needlespine pineapple cactus and two agaves that are critical food sources for the endangered lesser long-nosed bat and other nectar feeding bats at risk. Special status species found in the park include the Sonoran desert tortoise, American peregrine falcon, the lesser long-nosed bat, the western red bat, the Mexican long-tongued bat, the California leaf-nosed bat, and the Townsend's big-eared bat. A considerable number of crestate saguaros are found in the park.

Vegetative communities that can be found are exceptional diverse due to the variety of rock and soil types, higher than average rainfall, and is also the fact that the park is located in a transition zone between the Sonoran and Chihuahuan Deserts.

The expansion of the park would protect some of the tributary flows of the Rincon Creek as well as segments of the Agua Verde Creek.

The 1997 Open Space Bond Project has 1.2 million available for the acquisition of Agua Verde Creek. This acquisition would link Cienega Creek Natural Preserve with Colossal Cave, and protect and enhance a riparian corridor.

Davidson Canyon Natural Preserve

Approximately 6,191 acres of State and private land would encompass a preserve along 10 miles of Davidson Canyon upstream from Cienega Creek. This would provide a critical link between the Cienega Creek Natural Preserve and the Santa Rita Mountains by protecting a significant riparian corridor. Not protecting this area would result in the loss or degradation of a regionally significant biological corridor and an important hydrologic component. The existing I-10 overpass provides a wildlife crossing at an adequate distance above the canyon to mitigate the noise, vibration, and other impacts from the highway. Potential development impacts to private land immediately south of I-10 could impair this location as a viable corridor connection and may be incompatible with the preserve status.

Conservation of Davidson Canyon will protect a significant riparian corridor with natural springs and regular stream flow in certain locations, even during dry periods. From a regional perspective, the proposed Davidson Canyon Preserve is the principal connection between the two districts of the national forest, as well as a possible linkage through Colossal Cave Mountain Park to the Rincon Mountain District Expansion Area of Saguaro National Park.

Background -- Davidson Canyon is a broad, deep and impressive natural wash corridor approximately 12 miles long that contains high-quality riparian habitat and is extraordinarily picturesque. The canyon, situated a short distance east of the Sonoita Highway and south of Cienega Creek, connects the Cienega Creek Natural Preserve with the Nogales Ranger District of the Coronado National Forest in the Santa Rita Mountains. The first 1.5 miles of the canyon is located north of I-10, and the remainder is south. The canyon parallels the Sonoita Highway for four miles near its southern end, crosses under the highway in Section 15 of T17S, R16E, and ultimately enters the National Forest. The northernmost mile of Davidson Canyon is presently within the boundaries of the Cienega Creek Natural Preserve. The proposed Davidson Canyon Natural Preserve, a 6,191-acre unit, and would encompass the roughly 10 miles or so of the canyon not presently protected by Pima County or any other land management agency.

More than half of the land within the proposed Davidson Canyon Natural Preserve--approximately 3,343 acres--is State Trust Land controlled by the Arizona State Land Department. The other principal land type in the preserve is 2,845 acres of private property, which includes both large and small parcels. A small amount of federal property, less than 3 acres, is also included. As noted, Pima County already owns the northernmost mile of the canyon, which is located within the Cienega Creek Natural Preserve.

Davidson Canyon is located in an region that has been ranched since the 1870s, and ranching still continues on the State Trust Lands that compose and/or surround much of the canyon.

The preserve's significance as a corridor between protected natural areas is difficult to overstate; no other linkage proposed in the Sonoran Desert Conservation Concept Plan would connect as many existing or proposed mountain parks, preserves, and biologically significant resource lands.

The canyon's hydrologic characteristics are also important. Davidson Canyon collects drainage from the northeastern slopes of the Santa Rita Mountains and the northern and western faces of the Empire Mountains, and this runoff ultimately flows into Cienega Creek and through the Tucson Basin. Protecting the canyon in its natural form will maintain its important flood control capacity, as well as its natural recharge capabilities.

The Davidson Canyon Natural Preserve would also play a major role in protecting the scenic State Highway 83 corridor, which it parallels for a considerable distance. The conservation of the properties within the southern four miles of the preserve would protect and enhance what is universally regarded as one of southern Arizona's most picturesque drives.

Davidson Canyon's unspoiled rural location belies its exposure to compromising influences. In 1995, a large mining company proposed the development of a major mine along the canyon that would have involved blasting out large segments of adjacent land in search of the area's mineral value. The proposal was halted by litigation from a local rancher, who challenged the renewal of the firm's State Trust Lands mineral lease. However, interest in mining sections of the canyon continues to exist, and this fact provides additional motivation for its timely protection.

Existing Conditions -- The area surrounding Davidson Canyon looks rural, but appearances can be deceiving. This area is actually entering a transition phase, and large-scale development has been proposed for vacant private land very close to the proposed preserve. A tentative plat for the Mountain View Estates subdivision has been submitted for county review that proposes to build up to 382 homes just 1 mile east of the preserve's western boundary. The subdivision is planned for the east side of the Interstate 10-Sonoita Highway intersection, and will straddle I-10. Another large subdivision has been proposed for the west side of the Sonoita Highway immediately south of I-10. Both of these projects, which are located six miles east of the existing Rita Ranch development and undoubtedly be followed by other similar projects. When viewed in context with the previously-approved Vail Valley Ranch subdivision a few miles to the north, and existing subdivisions one mile west of the Sonoita Highway-Sahuarita Road intersection, a distinctive regional pattern begins to emerge. The land around the proposed Davidson Canyon Natural Preserve may be open space for now, but significant change is just around the corner.

Preserve Concept -- The preliminary concept for the Davidson Canyon Natural Preserve is for a protected natural area with controlled access consistent with the Cienega Creek Natural Preserve model. While its resources are not regarded to be as sensitive as those encompassed by the Cienega Creek preserve, Davidson Canyon is nonetheless of considerable significance biologically because of its function as an important biological corridor.

There may be a small number of recreational trails sited outside of the canyon proper (most of the trails already exist), some interpretive signage, a staging area in an appropriate location, and a shade structure or two. Signage and structures would reflect the traditional character of the area -- primitive and rustic.



John Dell

Davidson Canyon

Several proposed trails listed on the Eastern Pima County Trail System Master Plan, as well as a possible alignment for the Arizona Trail, pass through the proposed preserve. All of these trails are designated for non-motorized shared use (hikers, equestrians and mountain bicyclists), except for the Davidson Canyon Trail, which occurs in the bottom of the canyon and is proposed to only permit hikers and equestrians.

Existing roadways are capable of providing sufficient access to the preserve. A segment of the Old Sonoita Highway 1.5 miles long passes through the preserve along its western edge, and could provide access to a public staging area if such a facility proved desirable. The new Sonoita Highway also passes in immediate proximity of the preserve. An existing primitive trailhead situated along Marsh Station Road within the segment of the Cienega Creek Preserve that encompasses the lower mile of Davidson Canyon is presently used to access the canyon. This existing Cienega trailhead, coupled with an additional trailhead just east of the Old Sonoita Highway in Section 19 of T17S, R17E, would provide sufficient access to the proposed preserve.

Natural Resources -- The Davidson Canyon Natural Preserve encompasses both riparian and Sonoran Desert upland habitat, and its plant associations include the Velvet Mesquite-Mixed Scrub Association, Velvet Mesquite Association, Burroweed-Mesquite Association and the Creosote Association. The canyon's riparian habitat and spring-fed stream flows are its most significant and valuable features. Like the Cienega Creek corridor, the canyon's interior boasts an exceptional variety of plant and animal species, including velvet mesquite, whitethorn and catclaw acacia, cottonwood trees, seepwillow, saltbush, desert hackberry, graythorn, prickly pear, sacaton and deergrass. Upland plant species include the mesquite, palo verde, creosote, barrel cactus, ocotillo, yucca, and potentially the Pima Pineapple cactus, a listed endangered species. Wildlife species likely to be found within Davidson Canyon include endangered leopard frogs, fish such as the long-finned dace and potentially the endangered Gila topminnow, waterbirds, Mexican garter snakes, coyote, gray fox, skunk, collared peccary, bobcat, mule deer, and several varieties of bats, including the Mexican long-tongued bat. The Canyon's scenic values are another of its outstanding natural resources. The canyon's depth and breadth can be surprising, and certain sections of its rocky slopes are as visually appealing as the natural features in Cienega Creek's Three Bridges area. Other natural features of Davidson Canyon of importance--and great benefit -- to Pima County are the canyon's flood control and natural recharge capabilities.

Recreation Potential -- Davidson Canyon presently experiences only a small amount of recreational use. The area provides scenic hiking and horseback riding opportunities, but is not easily accessible south of I-10 and is not well known. The use of the short (1.5-mile) segment of Davidson Canyon north of Interstate 10 comes most often from visitors to the Cienega Creek Natural Preserve. An existing paved trailhead parking area along Marsh Station Road a short distance south of Cienega's Three Bridges site provides hiker and equestrian access into the north end of the canyon.

The majority of the visitation that occurs in the area south of I-10 probably comes in the form of a few explorers in motorized vehicles, who can use a utility corridor that runs south of I-10 to gain access to the vicinity of the canyon from the Sonoita Highway. A pair of primitive, little-used dirt access roads that can be reached from the south side of I-10 also provide access to the area. Two major utility corridors traverse the canyon, as do at least two ranch roads, all of which are used by visitors to the area to cross the canyon corridor. In addition to motorized users, a small quantity of equestrians and bicyclists use the existing primitive jeep roads on both sides of the canyon for recreational purposes, and hikers and equestrians occasionally use the bed of the wash.

Six trails listed on the Eastern Pima County Trail System Master Plan pass through the preserve. As previously mentioned, the Davidson Canyon Trail is proposed for use by hikers and equestrians. The following proposed trails support a non-motorized shared-use pattern:

- Trail #56 - Davidson Canyon
- Trail #278 - Gas Pipeline
- Trail #279 - Cienega-Area Powerline
- Trail #248 - Davidson Loop
- Trail #244 - Andrada Ranch Link
- Trail #267 - Twin Tanks

In addition to the trails presently proposed in the Eastern Pima County Trail System Master Plan, a segment of the Arizona Trail may also be sited within the preserve corridor. Two options are presently being considered for the Arizona Trail segment between Colossal Cave Mountain Park and the existing end of the trail at Oak Tree Canyon within the Nogales Ranger District of the Coronado National Forest. One option would have the trail skirt the Cienega Creek Natural Preserve and ultimately connect with the northern extreme of the BLM's Empire-Cienega Resource Conservation Area about 6 miles south of Interstate 10. The other option would route the trail along the west side of Davidson Canyon, through the county's proposed Santa Rita Mountain Park, and into the adjacent Coronado National Forest. Both alignments have considerable potential, and field work is now being conducted to determine which is the most suitable.

As noted, sufficient public access to the preserve can be provided by existing roadways. The best public access configuration would appear to be a combination of the existing Davidson trailhead within the Cienega Creek Natural Preserve and a new staging area just off the Old Sonoita Highway in Section 19 of T17S, R17E, approximately 1.25 miles south of the Sahaurita Road alignment. The potential new trailhead facility would be roughly 4.25 miles south of the existing trailhead, and could be sited immediately adjacent to the intersection of two Master Plan-listed trails with Davidson Canyon. Both of the Master Plan listed-trails are east-west trending alignments; the trail that connects to the canyon from the west leads into the proposed Santa Rita Mountain Park, and the trail that intersects the canyon from the east leads into the heart of the proposed Las Cienegas National Conservation Area.

Linkages to Other Protected Natural Areas -- One the two best features of the Davidson Canyon Natural Preserve is the terrific opportunity it presents to secure a perpetual biological linkage between the Santa Rita Mountains and the Cienega Creek Preserve. As previously noted, the canyon will play the principal role in the effort to create a chain of protected open space that includes the 262,000-acre Santa Catalina Ranger District of the Coronado National Forest and its 38,590-acre Rincon Wilderness, Colossal Cave Mountain Park, the Cienega Creek Natural Preserve, Santa Rita Mountain Park, and the 370,000-acre Nogales Ranger District of the Coronado National Forest and its 25,260-acre Mount Wrightson Wilderness. Additional linkages from Colossal Cave Mountain Park across the Rincon Valley to Saguaro National Park, the extension of the Cienega Creek Natural Preserve to the Empire-Cienega Resource Conservation Area, and the proposed Las Cienegas National Conservation Area further illustrate the dramatic potential of this proposed network.

The 12 mile-long canyon is an excellent wildlife corridor: long, relatively deep, and wide. The significant depth of the canyon at the location where it is crossed by Interstate 10 (1.5 miles south of its confluence with Cienega Creek) is a valuable feature, because it places the roadway a considerable distance from the creek bed, reducing the impact of the noise and activity produced by this high-volume roadway. The crossing is far superior to the I-10 crossing of Cienega Creek, which is relatively close to the bed of the creek, and much more intimidating to animal movement because of the proximity of the traffic and the vibrating deck of the bridge.

Santa Rita Mountain Park

Background--The proposed Santa Rita Mountain Park would encompass 10,703 acres of State Trust Lands (8,876 acres) and 1,826 acres of private land. The park is situated in the foothills of the Santa Rita Mountains south of Sahuarita Road and west of Davidson Canyon, adjacent to the proposed preserve. The location of the park is in a rural area that has begun the transition from a rural environment to urban fringe. The community of Corona de Tucson anchors the development in the area, and the park is bordered on its western side by a wildcat subdivision with more than 125 parcels, and by a large platted subdivision along its northern boundary. In addition, several new subdivisions are in the planning stages in the immediate vicinity. Preliminary plats for two large subdivisions are located west and east of I-10 and Sonoita Highway intersection, both of which would be within approximately two miles of the proposed park, and would have substantial impacts on the Sonoita Highway scenic corridor. Homes have already been built on the 1,826 acres of private property within the proposed boundary of the park, and others are likely to follow.

The proposed park was included as a component of the Mountain Parks, Reserves, and Biologically Significant Resource Lands for several reasons.

- The creation of the mountain park would protect the scenic northeastern slopes of the Santa Rita Mountains, an important viewshed that can be seen from the majority of the Tucson basin. The northern foothills of the Santa Ritas have already been impacted by residential development and mining activity, and the foothills region within the park represents a rapidly diminishing opportunity to protect the area's superb scenic values.
- The park would contribute to the protection of the visual integrity of the Highway 83 corridor, which is a State Scenic Route, and one of the most picturesque and enjoyable drives in southern Arizona.
- The park would help protect a segment of the range's northern watershed, which flows into Davidson Canyon and ultimately through the Tucson Basin. The dense vegetation that lines the drainages that feed Davidson Canyon have outstanding wildlife habitat values, and are located on State Trust Land that would be protected by the creation of the park.
- The park would assure public access into the northern reaches of the Coronado National Forest, as well as provide for a variety of low-impact recreational opportunities on its existing jeep roads and trails.
- Santa Rita Mountain Park may host a segment of the 780-mile, cross state Arizona Trail, which would link to the park's existing internal trail system. The park may also have moderating effects on the impacts of the proposed ASARCO Rosemont Mine.

Existing Conditions--The proposed Santa Rita Mountain Park encompasses the rolling foothills and lower slopes of the northeastern part of the Santa Rita mountain range. Existing resources within the proposed mountain park are in good condition. The State Trust Lands are grazed by private ranching interests. The park site is dotted with a number of mine shafts, as well as several drill holes and quarries. The elevations range from a low of 3,700 feet to a high point of 4,675 feet. The dominant vegetation in this community is semi-desert grassland that includes a variety of grasses, including grama grasses at higher elevations. Lehmann's lovegrass, an invasive exotic species, has infiltrated the park and continues to propagate.

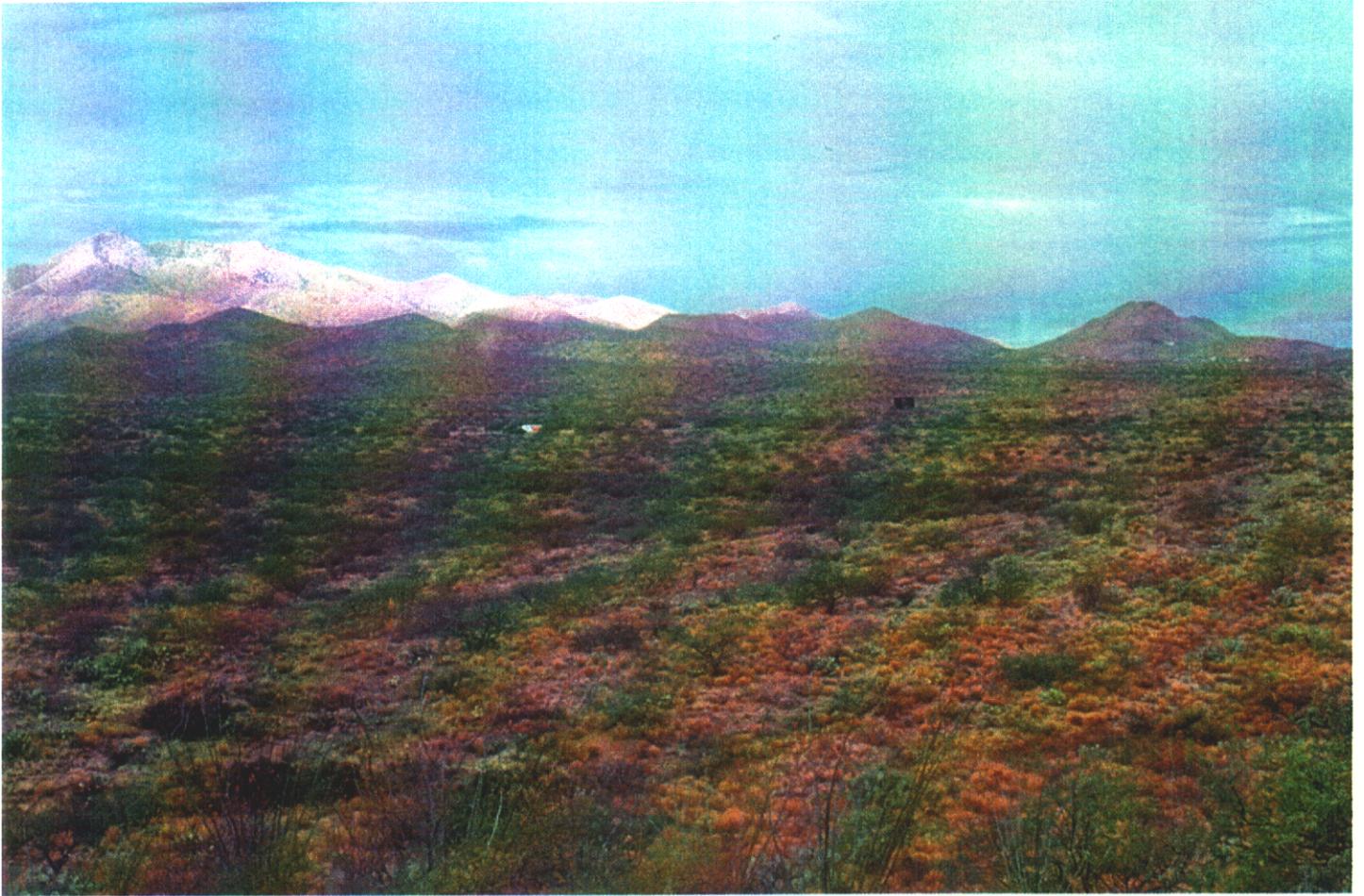
Natural Resources--The Santa Rita mountains have a tremendous diversity of wildlife that inhabits the range. In addition to the usual desert species such as mule deer, white-tail deer, javelina, quail, and cottontails, the area is also home to the Mexican opossum, the coatimundi, and mountain lions. A large variety of birds can be found in the area, including hummingbirds, several kinds of hawks, Golden eagles, and the tropical kingbird. Reptiles include several kinds of rattlesnakes, frogs, such as the lowland leopard frog, the western barking frog, Gila monster, and the Sonoran desert tortoise. A large variety of bats are found in the area, which features the Mexican long-tongued bat, the Pale Townsend's big-eared bat, the California leaf-nosed bat, the Ghost-faced bat, and the western red bat. Endangered species that the area may host include the cactus ferruginous pygmy owl, the jaguarundi, the lesser long-nosed bat, the Pima pineapple cactus, and the Gila topminnow.

Park Concept -- The preliminary concept for Santa Rita Mountain Park is similar to the concepts for the other new mountain parks proposed in the Sonoran Desert Conservation Concept Plan, and suggests a primitive unit with only a small amount of development. Park features could include trails, a central trailhead access staging area, several peripheral trailhead sites spaced around the park's perimeter, and a few rustic shade structures at various locations in the park that will offer a place to rest, picnic, or conduct an educational program.

Additional facilities that may be considered include restrooms, a water source, and a visitor contact station at the park's main access point, which will probably be located along Sahaurita Road. Pima County's goal to provide access into its new mountain parks only from the outer perimeter for resource protection reasons will be easy to achieve in this case, since the most logical location for the park's principal access is a matter of feet from Sahaurita Road.

Because the park is located in an area historically and currently used by ranchers, Pima County could work with these ranchers to protect their use of the land and to preserve traditional uses that are consistent with resource conservation. The mine shafts, drill holes and quarries that exist on the site could be mitigated for public safety, but probably will not be sealed to protect bat habitat.

As with the other mountain parks and natural preserves proposed in the Sonoran Desert Conservation Concept Plan, the exact configuration of the park will not be determined until completion of the Sonoran Desert Conservation planning process.



John Dell

Santa Rita Mountain Park

Recreation Potential -- The area is presently lightly used for recreational purposes, partially because of its distance from urban Tucson and partially because it is not well-known. The proposed mountain contains the following existing primitive roads and trails, some of which are listed on the Eastern Pima County Trail System Master Plan:

- Trail #70 - Sahuarita Road
- Trail #256 - Mt. Fagan East Loop
- Trail #257 - Mt. Fagan West Loop
- Trail #244 - Andrada Ranch Link
- Trail #267 - Twin Tanks Trail
- Trail #271 - State Highway 83
- Trail #275 - Old Sonoita Highway

In addition, a segment of the Arizona Trail may be ultimately sited through the proposed Santa Rita Mountain Park. This possible alignment would travel along the western side of the proposed Davidson Canyon Natural Preserve and enter the park near the Highway 83-Sahuarita Road intersection.

The trail would pass through the park along its eastern side and eventually enter the National Forest, where it would then continue south to connect with the existing Arizona Trail alignment at Oak Tree Canyon.

Other recreational activities that would complement the park's resource protection mission include birdwatching, fishing, hunting (per the regulations of the Arizona Game and Fish Department), and possibly a small quantity of dispersed camping at carefully-selected sites.

Linkages to Other Protected Natural Areas--One of the most significant features of the proposed Santa Rita Mountain Park is the role it could play as a link in the regional open space system and the connections it will provide. The park backs up to the Nogales Ranger District of the Coronado National Forest, and would help protect the northeastern foothills of the Santa Ritas, which were not included in the forest when its boundaries were drawn. The park would link Davidson Canyon to the Coronado National Forest, and protect key tributaries that flow into the canyon.

From a regional view point, the park serves as a link in a major corridor that connects the Nogales Ranger District of the forest to Davidson Canyon, the Cienega Creek Natural Preserve, Colossal Cave Mountain Park, and the Santa Catalina Ranger District of the Coronado National Forest. If the Colossal Cave expansion is successful, the corridor would also link to Saguaro National Park. The park and its linkage to Davidson Canyon would enhance the purpose of the proposed Las Cienegas National Conservation Area.

Without protection, the edge of urbanization would come within close proximity of the Cienega Creek watershed and result in habitat loss, alteration, fragmentation, and increased groundwater pumping.

Empire Mountain Park

A Pima County Mountain Park encompassing 11,720 acres of the Empire Mountain range was first proposed 15 years ago. The Tucson Field Office of the U.S. Bureau of Land Management is already active in the Empire Mountains area and is committed to acquiring additional land in the range to complement its existing holdings. The area south of the Empirita Ranch is being analyzed and planned for in the content of the Resource Management Plan for the Empire-Cienega Resource Conservation Area.

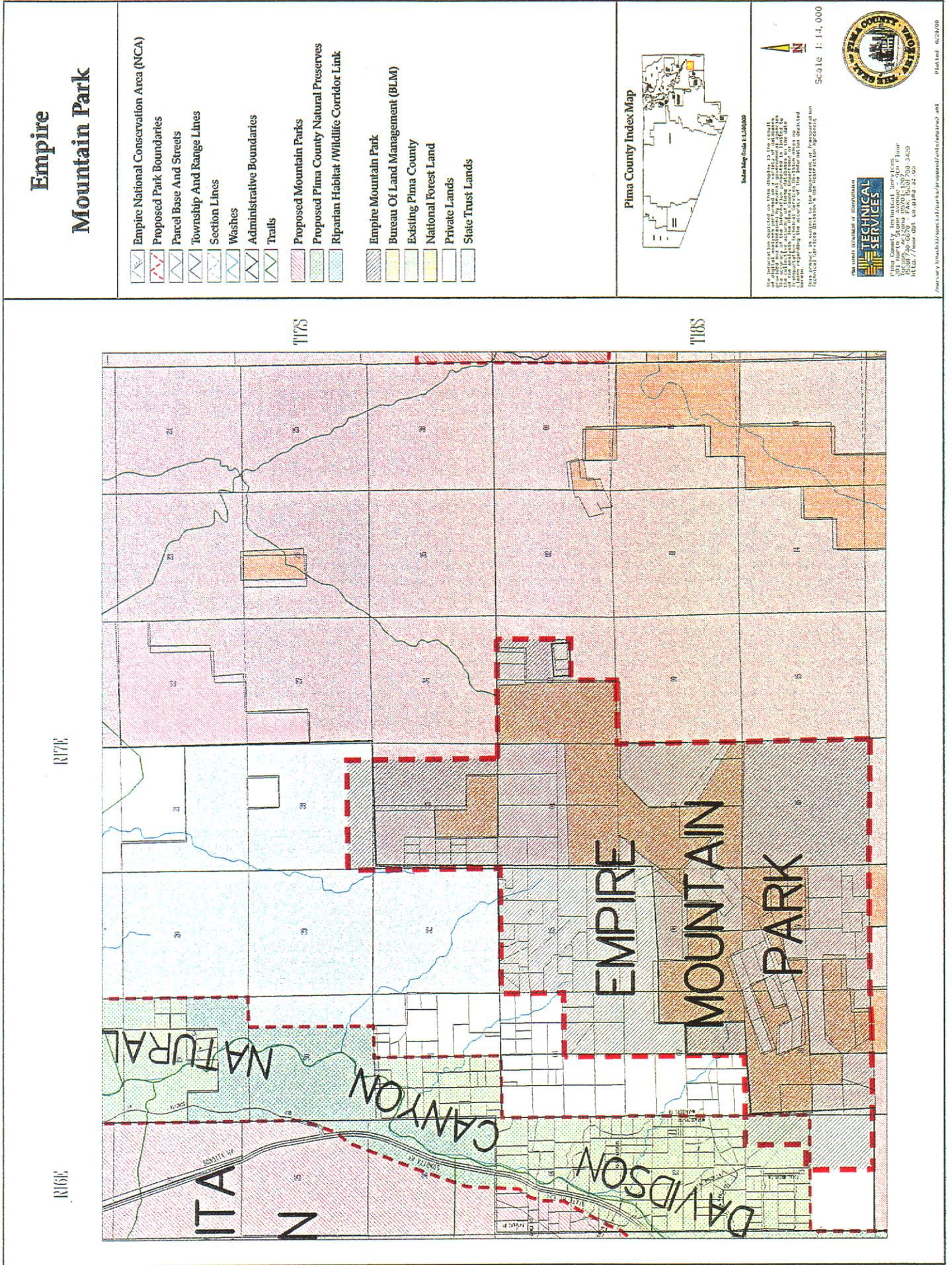
Las Cienegas National Conservation Area (NCA)

The creation of Las Cienegas NCA has been proposed by a bill introduced to Congress in September 1999. The NCA would encompass over 200,000 acres and include the Empire-Cienega Resource Conservation Area, Cienega Creek Natural Preserve, Colossal Cave Mountain Park, State Lands, other BLM land, and private lands. The NCA would provide a connecting corridor of land between the Catalina and Rincon Mountains, the Cienega and Rincon Creek watersheds, the Santa Rita Mountains, and National Forest lands in southern Arizona. The NCA would not transfer land out of private ownership or restrict private property rights. Grazing and recreation activities would continue in appropriate areas. Hunting would also continue.

Habitats protected by the NCA would include cienega marshlands, cottonwood-willow riparian woodlands, juniper-oak woodlands, sacaton grasslands, mesquite bosques, and semi-desert highland grasslands. Wildlife species protected include native fish such as the Gila topminnow, the endangered lesser long-nosed bat and other bat species, southwestern willow flycatcher, yellow-billed cuckoo, leopard frogs, and many other important wildlife species. The NCA would also protect the watershed, groundwater reserve, and perennial and intermittent flows by limiting activities at areas of surface flows, and minimizing groundwater pumping.

The incorporation of the NCA is driven by the desire to prevent urbanization of the Cienega Creek watershed. Biological stressors associated with urbanization include habitat removal, alteration and fragmentation, increased groundwater pumping and depleted water resources, competition by invasive species, and human use overuse.

Figure 18



Applicable Planning Documents

The following planning documents contain information pertaining to the Cienega Creek Natural Preserve and/or the area surrounding the park:

- Colossal Cave Master Plan Background Report (1998)
- 1997 Open Space Bond Program
- Eastern Pima County Trail System Master Plan (1996)
- Cienega Creek Management Plan (1994)
- Pima County Comprehensive Plan (1992)
- The Findings of the Pima County Open Space Committee - A Report to the Pima County Board of Supervisors (1988)

The following planning documents contain information pertaining to Colossal Cave Mountain Park and/or the area surrounding the park:

- Colossal Cave Mountain Park Master Plan Background Report (1998)
- Rincon Valley Subregional Trails Plan (1998)
- Eastern Pima County Trail System Master Plan (1996)
- Cienega Creek Natural Preserve Management Plan (1994)
- Pima County Comprehensive Plan (1992)
- The Findings of the Pima County Open Space Committee - A Report to the Pima County Board of Supervisors (1988)
- Coronado National Forest Land and Resource Management Plan (1986)

The following planning documents contain information pertaining to the proposed Davidson Canyon Natural Preserve and/or the area surrounding the preserve:

- Eastern Pima County Trail System Master Plan (1996)
- Cienega Creek Natural Preserve Management Plan
- Pima County Comprehensive Plan (1992)
- Coronado National Forest Land and Resource Management Plan (1986)

The following planning documents contain information pertaining to the proposed Santa Rita Mountain Park and/or the area surrounding the park:

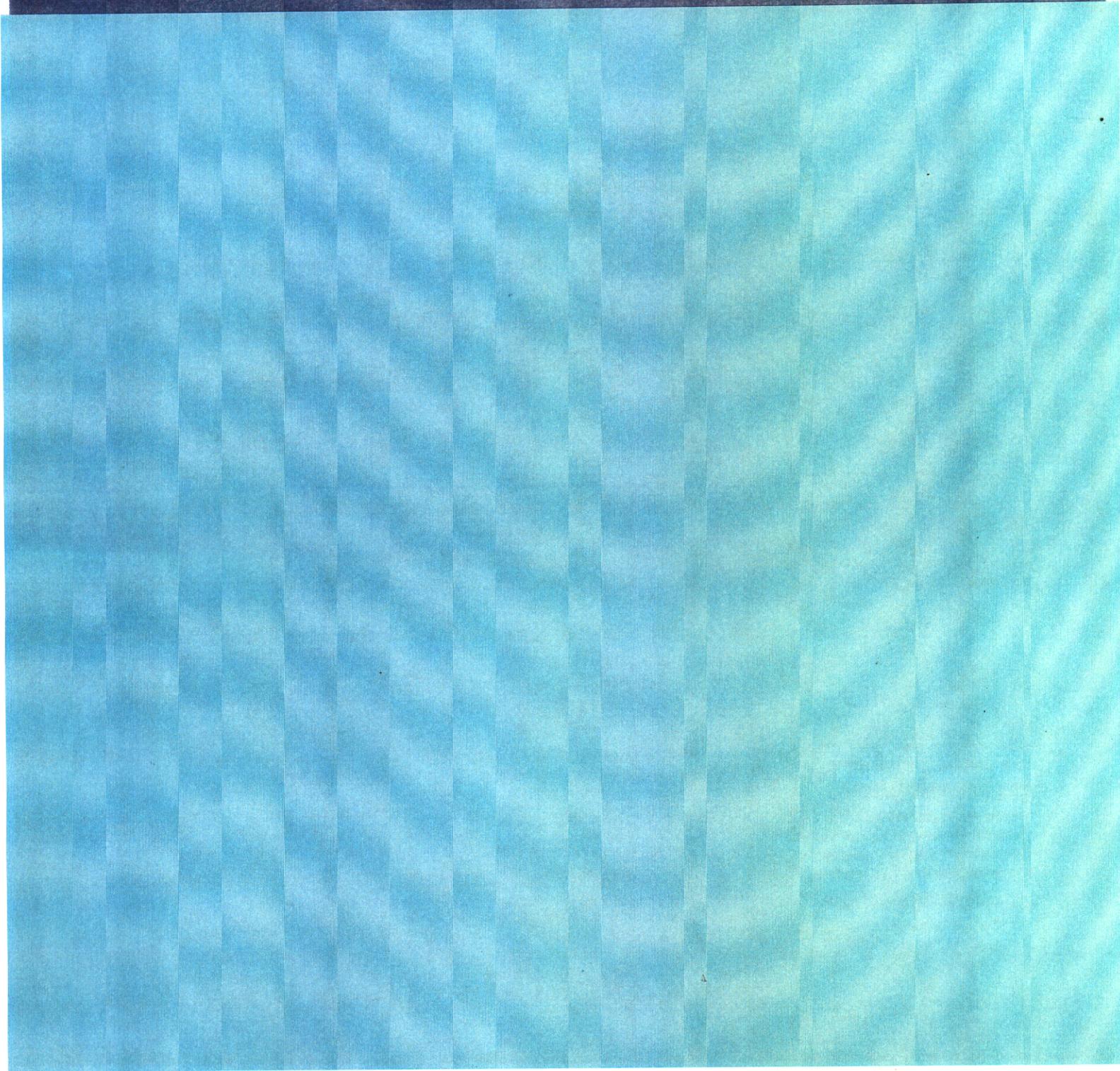
- Eastern Pima County Trail System Master Plan (1996)
- Pima County Comprehensive Plan (1992)
- Coronado National Forest Land and Resource Management Plan (1986)
- Cienega Creek Management Plan (1994)
- Cienega-Rincon Subarea Resource Report (2000)

Mountain Parks, Reserves and Biologically Significant Resource Lands

UPPER SANTA CRUZ SUBAREA

Sonoran Desert Conservation Plan

August 2000



Introduction

The Upper Santa Cruz subarea extends north from the Pima/Santa Cruz County line to Martinez Hill, near the northern boundary of the San Xavier District of the Tohono O'odham Nation (see Figure 20). The subarea consists of the valley formed by the Santa Cruz River, the Santa Rita Mountains to the east, and the Sierrita Mountains on the west. The communities of Green Valley, Continental, and the Town of Sahuarita are within the subarea.

The Santa Cruz River and its floodplain was a focus of prehistoric Native American settlement and agriculture, a travel corridor for Spanish Colonial exploration and mission settlement, and the location of Spanish and Mexican period land grants. Historically, the area has been used for mining, ranching and farming.

The subarea remains an important travel route, linking Mexico with the United States along Interstate-19. The valley remains largely rural, with large expanses of open space, comprised of ranches and a limited amount of public reserves. However, the river corridor is rapidly urbanizing, especially in Green Valley and Sahuarita.

Although much of the valley floor is taken up with a growing urbanized corridor along I-19 and in the Town of Sahuarita, ranching continues to be an important part of the economy and land management in areas closer to the east and west mountain ranges. In addition to private ranches, the 51,984 acre Santa Rita Experimental Range is operated by the University of Arizona for the purpose of studying range ecology and management techniques. Increasing urbanization pressures on ranchers to sell off their properties results in lot-splitting which may cause the loss of the biological resources by habitat fragmentation and increased groundwater pumping to serve a growing population.

Mining has made a significant impact on the natural environment within the subarea. ASARCO operates six open pit copper mines at their 20,000 acre Mission Complex, while nearby Cyprus Climax has three open pit mines. Although copper mining is projected to decrease, new techniques to extract the ore has extended the viability of mining in this subarea. Other areas, particularly within the Santa Rita Mountains are also being explored for their mining potential.

GAP Status of the Upper Santa Cruz Subarea

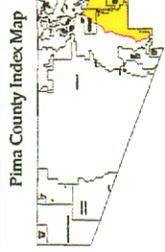
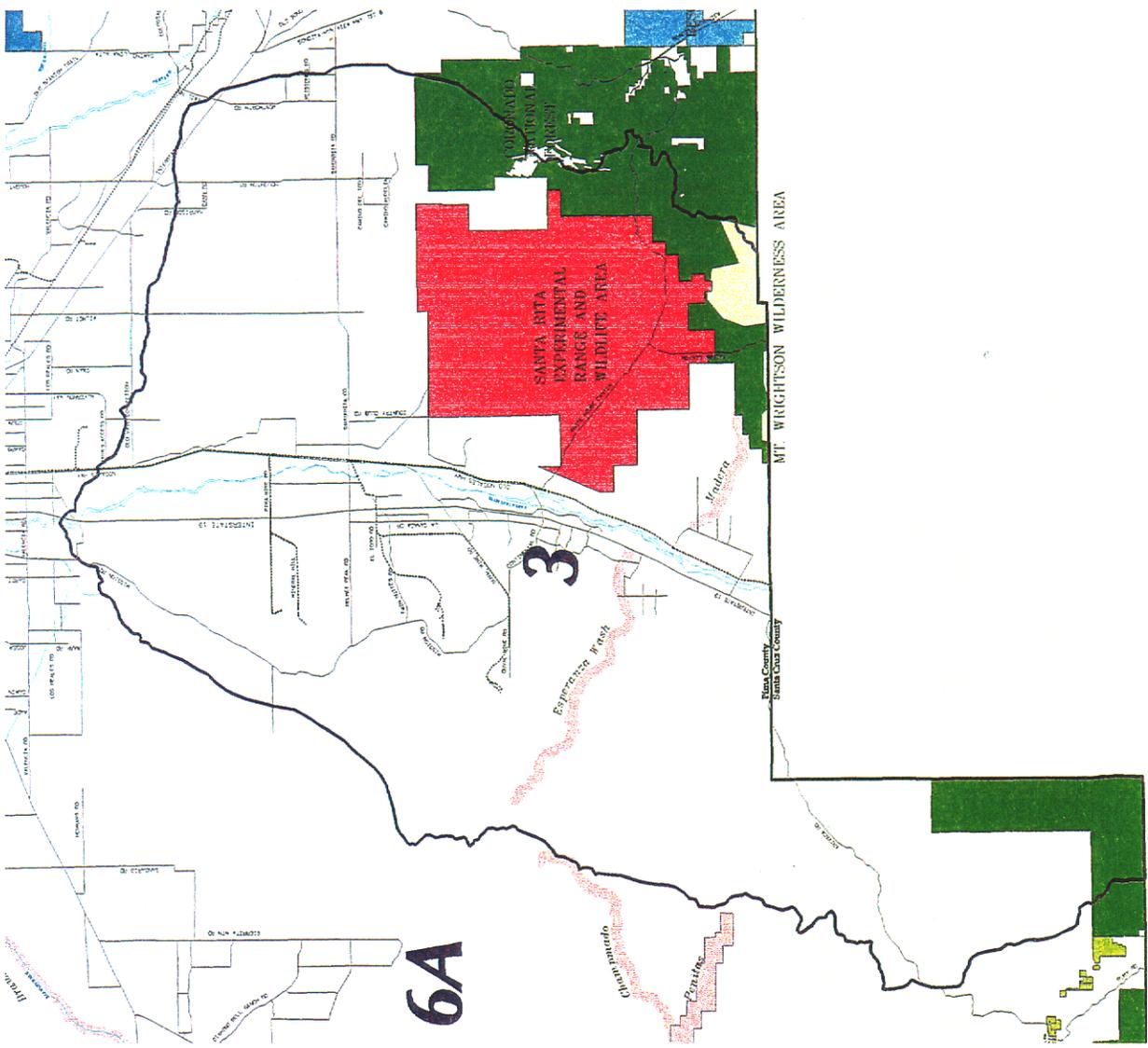
The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 9).

Figure 20

Upper Santa Cruz

SDCP PLANNING AREA 3

- Major Streets
- Major Washes
- Sub-Area Boundary
- Coronado National Forest
- Saguaro National Park East
- Cienega Creek Natural Preserve
- Empire-Cienega RCA
- Santa Rita Experimental Range
- Mt. Wrightson Wilderness Area
- Buenos Aires National Wildlife Refuge
- Wildlife Corridor Links



Scale Map Grid 31.200000



SCALE 1:50,000

The information contained on this map is the property of Pima County, Arizona. It is provided for informational purposes only. The user assumes all responsibility for the use of this information. The information is not to be used for any purpose other than that for which it was prepared. The information is not to be used for any purpose other than that for which it was prepared. The information is not to be used for any purpose other than that for which it was prepared.



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Planning Area 3

The Upper Santa Cruz Subarea has 92,660 acres of protected land, including lands in the Coronado National Forest, Mt. Wrightson Wilderness Area, and the Santa Rita Experimental Range (see Table 9). Reserved land totals 21 percent of the subarea. Land outside of existing reserves (unreserved Status 4 lands), including private, state, or other land total 357,025 acres.

The addition of 500 potential reserve acres would total 93,160 acres of protected land, or 21 percent of Subarea 3 in Status 3b or higher. The remaining 79 percent is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the multi-species habitat conservation plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 10 lists the priority vulnerable species.

Vulnerable Biological Features

Habitats most at risk in Subarea 3 are the mixed riparian and xeroriparian woodlands associated with the Santa Cruz River and its tributaries, palo verde mixed scrub associations in uplands, and areas of semi-desert grasslands. Habitats supporting the Pima pineapple cactus and the western yellow-billed cuckoo are at risk from urbanization. Table 10 lists priority streams and springs found within the subarea.

Potential Stressors

Primary stressors to biological resources include habitat loss, alteration and degradation; habitat fragmentation; human use and overuse; a decline in ground water levels; and competition by invasive species. The majority of the subarea is in land status 4a and 3b, with substantial areas of urban and other intensive uses.

Existing Stressors

Activities contributing to stress are groundwater pumping for mines, agriculture, and urban uses; mining; historic overgrazing; loss of native vegetation to agriculture; conversion of agricultural lands to urbanized uses; rapid urbanization of the I-19 corridor; and lot splitting in rural areas along the Sahuarita Road corridor and in the Arivaca area.

Growth by lot-splitting has become prevalent along Sahuarita Road and Arivaca Road. If residential growth and groundwater pumping continues in this area, the water table may decline and vegetation supported by the shallow groundwater could be lost. Increased

Table 9: Existing and Potential Reserves of Upper Santa Cruz Subarea 3

Upper Santa Cruz Subarea 3		GAP Status					
		Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Existing Reserves	Acreage						
Coronado National Forest	37,071					x	
Mt. Wrightson Wilderness Area	3,605	x					
Santa Rita Experimental Range	51,984					x	
Potential Reserve Expansions*							
Canoa Ranch	?					x	
Total Acres of Existing and Potential Protected Land	92,660 +						
Total Acres of the Upper Santa Cruz Subarea	449,685						

*Until further planning is done, the GAP Status of potential reserves cannot be known. It is assumed the level of protection will be Status 3b or higher.

Table 10: Upper Santa Cruz Priority Vulnerable Species, Streams and Springs

Priority Vulnerable Species	Priority Streams	Springs
<p><i>Choeronycteris mexicana</i> Mexican long-tongued bat</p> <p><i>Sorex arizonae</i> Arizona shrew</p> <p><i>Lasiurus blossevillii</i> Western red bat</p> <p><i>Leptonycteris curasoae</i> Lesser long-nosed bat</p> <p><i>Macrotis californicus</i> California leaf-nosed bat</p> <p><i>Peromyscus merriami</i> Merriam's mouse</p> <p><i>Plecotus townsendii</i> Pale Townsend's big-eared bat</p> <p><i>Aimophila carpalis</i> Rufous-winged sparrow</p> <p><i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo</p> <p><i>Empidonax traillii extimus</i> Southwestern willow flycatcher</p> <p><i>Pipilo aberti</i> Abert's towhee</p> <p><i>Vireo belli</i> Bell's vireo</p> <p><i>Buteo swainsoni</i> Swainson's hawk</p> <p><i>Glaucidium brasilianum cactorum</i> Cactus ferruginous pygmy-owl</p> <p><i>Terrapene ornata luteola</i> Desert box turtle</p> <p><i>Cnemidophorus burti stictogrammus</i> Giant spotted whiptail</p> <p><i>Rana yavapaiensis</i> Lowland leopard frog</p> <p><i>Rana chiricahuensis</i> Chiricahua leopard frog</p> <p><i>Sonorella sp.</i> Talus snail</p> <p><i>Coryphantha scheeri robustispina</i> Pima pineapple cactus</p> <p><i>Dalea tentaculoides</i> Gentry indigo bush</p> <p><i>Tumamoca macdougallii</i> Tumamoc globeberry</p>	<p>Florida Canyon</p> <p>Franco Wash</p> <p>Madera Canyon</p>	<p>25 spring locations</p> <p>18 on U.S. Forest Service land</p> <p>1 private</p> <p>2 on State land</p> <p>4 on U.S. Bureau of Land Management land</p>

development may result in channelized washes, with downstream flooding and upstream erosion and channel cutting as a likely outcome. The potential for erosion and watershed degradation will compound the impacts of habitat loss and fragmentation that is associated with urbanization of rural areas.

Groundwater pumping to support the mines, agriculture, and urban uses have contributed to the decreasing groundwater levels. The potential development of a lake in Sahuarita is an additional threat to groundwater.

Increasing development pressures have also resulted in the sale of pecan groves. This is a concern because of the presence of many bird species found in the groves, particularly the yellow-billed cuckoo, a species pending USFWS review for listing as endangered.

Mineral extraction in this area, and the potential for mineral resources in the Santa Rita Mountains, establishes the possibility of continued and possibly expanded mining activities. Effects on biological resources from mineral extraction include habitat loss and fragmentation, potential watershed contamination, and intensive groundwater pumping to support mine operations. Affected habitats could represent heavily forested areas at higher elevations, riparian canyons, oak woodlands, and grasslands.

Ranching

The Upper Santa Cruz Valley was historically one of the most significant ranching valleys in eastern Pima County. Ranching continues in the Upper Santa Cruz Valley, but is discontinuous from east to west as a consequence of development trends along I-19,. Today, ranching is located in the upland areas on slopes and bajadas of the surrounding mountain ranges.

Many ranches operating today consist of private and State Trust leased land. A handful of ranches also include leases of federal properties. Considering the present leases, a total of 4,315 animals may be grazed in the Upper Santa Cruz Subarea.

Some 7,359 acres in this subarea are devoted to agricultural use, with 5,000 acres included in the remaining pecan orchards located near Green Valley.

Cultural and Historical Resources

The initial occupation of the Upper Santa Cruz Valley occurred in perhaps 5,000 B.C., while Paleoindian use of the valley is possible as early as 10,000 B.C. Prehistoric sites are predominantly Hohokam in origin, but earlier Archaic Period sites also exist. Late Archaic and the Hohokam cultures up to 1450 A.D. most likely utilized the reliable water source along the Santa Cruz.

Father Kino's arrival in southern Arizona in 1691 was a landmark event that brought significant changes in social and economic life as well as religious beliefs. He established the well known

San Xavier del Bac mission in 1700 to serve the Tucson area. Later, in 1775, the expedition of Juan Bautista de Anza traveled and camped along the Santa Cruz as they made their way from Sonora, Mexico north towards the San Francisco Bay in California.

After Mexican independence from Spain in 1821, many land grants were filed in southern Arizona to encourage settlement by farmers and ranchers. Today, these original land grants represent the very earliest attempts to establish cattle ranching by civilians outside of the mission settlements. Origins of the historic Canoa Ranch date from this period of history.

Recreational Resources

The majority of recreation within the Upper Santa Cruz Subarea occurs within the Santa Rita Mountains. Recreation and other Forest uses are administered by the Coronado National Forest and include camping, day use activities and numerous existing trail opportunities.

In terms of trail use outside the Coronado National Forest, the Eastern Pima County Trail System Master Plan identifies many proposed trails within this subarea. One of particular note is the Juan Bautista de Anza National Historic Trail. The path of this proposed trail generally follows the west bank of the Santa Cruz River corridor. The 220 year old trail commemorates the Anza Expedition of 1775-1776 and is one of 11 National Historic Trails in the United States, and the only National Historic Trail in Arizona.

The Santa Cruz River corridor is also a proposed trail a proposed trail in the Eastern Pima County Trail System Master Plan. A 50 mile multi-use trail is planned from Santa Cruz County north to Pinal County. The trail is a planned linear park corridor with full access for a variety of trail uses.

Table 11: Upper Santa Cruz Public Use Policies

Managing Entity	Reserve Name	Public Use Policies													Comments				
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Plinking	Shooting Range	Fishing		Swimming	Dogs On Leash	Rock Climbing/Rappelling	
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	N	N	R	NA	R	R	R	Consult Appropriate Agency
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
University of Arizona	Santa Rita Experimental Range	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	NA	NA	N	NA	
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
 R = Restrictions
 P = Permit Required
 N=No
 NA=Not Applicable

This chart contains the most accurate information available at the time of printing. For current information regarding reserve policies, please contact the reserve management.

Table 12: Upper Santa Cruz Resource Policies

Managing Entity	Reserve Name	Resource Management Policies														Comments						
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog	
Varies	Wilderness Areas	R	N	P	N	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	
U.S. Forest Service	Unreserved Coronado National Forest	P	Y	Y	Y	P	P	P	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
University of Arizona	Santa Rita Experimental Range	P	P			P	N	P	N	Y	N	N	N	N	Y	Y	Y	Y	N	Y	Y	
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	

Y=Yes
 N=No
 R = Restrictions NA=Not Applicable
 P = Permit Required

Existing Reserves

Santa Rita Experimental Range

Background²--The Santa Rita Experimental Range (SRER) was established in 1903 to protect the native rangeland from grazing and to conduct research on associated livestock production. The range is characterized by small areas of steep, stony foothills and a few isolated buttes, but the dominating landscape feature are the long, gently sloping alluvial fans. Elevations range from 2,900 feet to about 5,200 feet in the southwestern part. Average rainfall increases with elevation, from 10 inches at 2,900 feet to almost 20 inches at 4,300 feet.

Management of the SRER is the responsibility of the College of Agriculture, University of Arizona. Originally owned by the U.S. Bureau of Land Management and managed by the U.S. Forest Service, the transfer of the land to the Arizona State Land Department was authorized by Congress in 1988. The Arizona legislature prescribed the SRER would be used exclusively for ecological and rangeland research, and would be managed by the U of A. Currently, the U of A holds a 10 year lease from the State Land department that expires in 2004.

Natural Resources--Vegetation at the SRER varies with soil, rainfall, and elevation differences. Annual vegetation is most abundant in areas with a moderate to low density of perennial grasses and in areas where native grasses persist over the invasive Lehmann's lovegrass. Many small dry washes and gullies provide micro-habitats where cool and warm-season annuals propagate.

Since the early 1900's, major vegetation changes have occurred. Where shrub-free grassland once dominated, velvet mesquite is now the dominant overstory species. Lehmann's lovegrass, an exotic invasive deliberately planted throughout 1954 through 1975, is now the dominant grass species throughout 40 percent of the range.

A diverse array of wildlife is found in the SRER, including important game species such as mule and white-tailed deer, collared peccary, Gambel's quail, white-winged dove, and other species such as ringtail cats, badger, gray fox, and bobcat. Many species of birds are also found on the range including the Botteri's and rufous-winged sparrows, the great horned owl, and the western kingbird. The Gila monster, two species of rattlesnake, and a variety of other reptiles are also found on the range.

Research--The purpose of the SRER is to develop methods that can be used to manage semiarid rangelands to insure long-term productivity. Benefits derived from the rangelands include livestock products, wood, water, wildlife, flood control benefits, and open space for recreation.

² Information on the background and natural resources of the SRER derived from: Medina, Alvin L. 1996. *The Santa Rita Experimental Range: Annotated Bibliography (1903-1988)*. General Technical Report RM-GTR-276. Rocky Mountain Forest and Range Experiment Station.



Gale Bundrick

Santa Rita Experimental Range

Research at the SRER involves the study of ecology and physiology of desert grassland plants and wildlife, brush control, plant introduction and reseeding, runoff and erosion control, range livestock nutrition and behavior, livestock/wildlife interactions, remote sensing, and many other topics of research.

Linkages to Other Protected Areas--The SRER shares its southeast border with the Coronado National Forest, Nogales Ranger District. The SRER is facing increasing development pressures as evidenced by subdivisions and lot-splitting to the north and west of the Range. The linkage to the Coronado Forest becomes increasingly important as development increases along the SRER north and west boundaries.



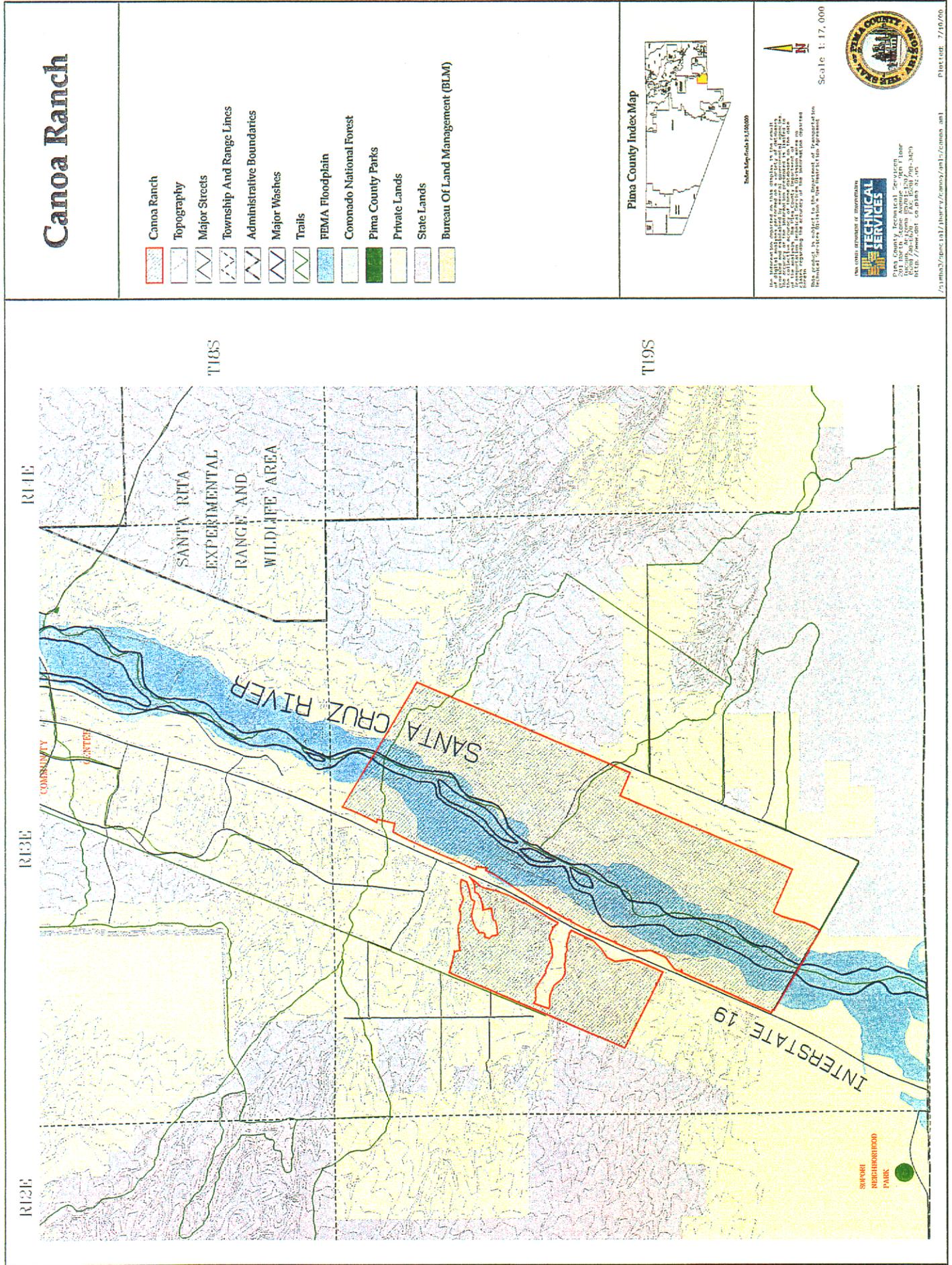
**Madera Canyon, Santa Rita Mountains,
Coronado National Forest**

Opportunities for Protection

Canoa Ranch

The 1997 Open Space Bond Program provides \$2,000,000 to acquire approximately 500 acres of property on this historic ranch (Figure 23). Conservation efforts are a matter of on-going discussion.

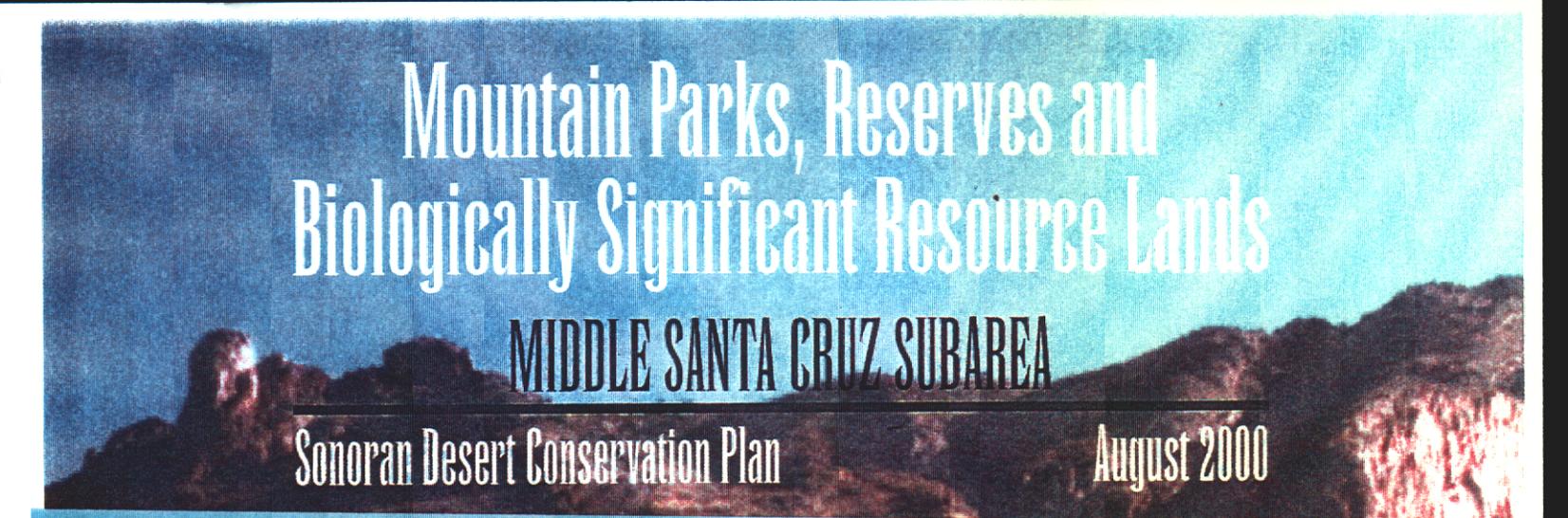
Figure 23



Applicable Planning Documents

The following documents contain information pertaining to the proposed Canoa Ranch acquisition:

- 1997 Open Space Bond Program
- Pima County Comprehensive Plan (1992)
- Eastern Pima County Trail System Master Plan (1996)
- Resources of the Upper Santa Cruz Subarea (2000)



Mountain Parks, Reserves and Biologically Significant Resource Lands

MIDDLE SANTA CRUZ SUBAREA

Sonoran Desert Conservation Plan

August 2000

Introduction

The Middle Santa Cruz subarea encompasses most of the Tucson Basin and its internal watersheds; namely, the Santa Cruz River, Rillito River, Tanque Verde Creek, Pantano Wash and Rincon Creek (see Figure 24). The basin is bounded by the Tucson Mountains to the west, the Catalina Mountains on the north, the Rincon Mountains to the east and the Santa Rita Mountains to the south.

The Santa Cruz River flows north through the Tucson Basin from Santa Cruz County and Mexico. Historically, the river was the focal reason for early settlement within the basin. However, early farming of the area quickly depleted the surface water affecting the riparian growth once abundantly found along the riverbanks.

The landscape character varies throughout the subarea but is dominated by urbanized land uses. The population of Tucson has grown significantly over the years and has extended the urban boundary outward into previous undeveloped desert lands. Much of the Tucson Basin has been developed, resulting in removal of native vegetation that was vital to wildlife, including important riparian and xeroriparian habitats. Within the urban core, remaining natural areas continue to exist as independent ecologically isolated islands; however, their ability to function as a part of the larger ecosystem will greatly depend on maintaining linkage with the existing and proposed mountain parks and reserves that surround the basin.

In the past, most landscaping associated with development utilized non-native, high water use plants. Many of these introduced non-native plants are invasive and have spread into washes and natural areas competing with native species. This competition, in many cases, has resulted in lost or altered habitat creating long term effects on the subarea ecosystem.

Recently, there has been a growing concern about the use of non-native plant species and their overall effect. Pima County, the City of Tucson and the Town of Oro Valley have all implemented ordinances requiring developers to use plant species that are compatible with native habitats found within the basin. These ordinances are critical to the long term protection and preservation of our watersheds, riparian habitat and wildlife.

The Tucson Basin is faced with the dilemma of community growth and managing multiple resources to support that growth while trying to maintain a quality of life that's suitable for all species. The success of the Sonoran Desert Conservation Plan will play a major role resolving some of these more pressing issues.

The Middle Santa Cruz subarea has reserved land bordering its eastern and western boundaries. These reserves include the Tucson Mountain Park, the Saguaro National Park, Coronado National Forest, the Roy P. Drachman Agua Caliente Park, and several designated Wilderness areas (refer to Table 13 for acreages and managing entities). Potential reserve expansions include several target areas from the 1997 Open Space Acquisition Master Plan (see Table 13 for acreages).

GAP Status of the Middle Santa Cruz Subarea

The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 13).

The Middle Santa Cruz Subarea has 131,561 acres of reserves, including lands managed by Pima County Parks and Recreation, U.S. Forest Service, and U.S. National Park Service (see Table 13). Reserved land totals 36 percent of the subarea. Lands outside of reserves (unreserved Status 4 lands), including private, state, or other land have a total of 230,291 acres. The addition of 2,690 potential reserve acres would total 134,206 acres of protected land, or 37 percent of Subarea 4 in Status 3b or higher. The remaining 63 percent is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the Multi-species Habitat Conservation Plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team, which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 14 lists the priority vulnerable species.

Vulnerable Biological Features

Habitats most at risk in Subarea 4 are areas of shallow groundwater, stream reaches with perennial flows, stands of mixed riparian and xeroriparian woodlands associated with the Santa Cruz River and its tributaries, and palo verde mixed scrub associations in uplands. Aquatic restoration projects, are or will be at risk from competition and predation by non-native and invasive species. Table 14 lists priority streams and springs found in this subarea.

Potential Stressors

Primary biological stressors include habitat loss, alteration and degradation; habitat fragmentation; human use and overuse; a decline in ground water levels; decline in stream surface flows; competition and predation by invasive species; and disease. Much of this subarea is dominated by the Tucson urbanized area.

Table 13

Existing Reserves of the Middle Santa Cruz

Land Manager	Existing Reserves	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Pima County	Tucson Mountain Park	6,466			x			
	Roy P. Drachman Aqua Caliente Park	101				x		
The Nature Conservancy	The Nature Conservancy	68		x				
U.S. National Park Service	Saguaro National Park (Tucson Mnt. District) Wilderness	796	x					
	Saguaro National Park (Tucson Mnt. District)	698		x				
	Saguaro National Park (Rincon District)	4,557		x				
	Saguaro National Park (Rincon District) Wilderness	22,133	x					
U.S. Forest Service	Rincon Mountain Wilderness	4,893	x					
	Coronado National Forest	49,299					x	
	Pusch Ridge Wilderness Area	42,550		x				
Total Acres of Existing Reserves		131,561						
Total Acres of the Middle Santa Cruz subarea		361,852						

Potential Reserve Expansions of the Middle Santa Cruz

Land Manager*	Potential Reserve Expansions**	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Pima County	Tucson Mountain Park General	600					x	
	Tucson Mountain Park Painted Hills	400					x	
	Tumamoc Hill	320					x	
	TMP: Robles Pass	400					x	
	Sabino Canyon	150					x	
	Agua Caliente Creek	300					x	
	Tanque Verde Creek	460					x	
	Mt. Lemmon Highway Base	60					x	
Total Acres of Existing and Potential Reserves		134,251						
Total Acres of the Middle Santa Cruz Subarea		361,852						

*Managing entities may change with the acquisition of land

** Until further planning is done, the GAP status of potential reserves cannot be known. It is assumed the level of protection will be Status 3b or higher.

Table 14: Middle Santa Cruz Priority Vulnerable Species, Streams, and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Sabino Canyon	46 spring locations
<i>Idionycteris phyllotis</i> Allen's big-eared bat	Tanque Verde Creek	13 privately owned
<i>Lasiurus blossevillii</i> Western red bat	Romero Canyon	26 on U.S. Forest Service land
<i>Leptonycteris curasoae</i> Lesser long-nosed bat	Bear Canyon	5 owned by U.S. National Park Service
<i>Macrotis californicus</i> California leaf-nosed bat	Agua Caliente Canyon	1 owned by The Nature Conservancy
<i>Peromyscus merriami</i> Merriam's mouse	Ventana Canyon	1 owned by Pima County
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat	Pantano Wash	
<i>Aimophila carpalis</i> Rufous-winged sparrow	Rillito Creek	
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	Molino Canyon	
<i>Athene cunicularia</i> Burrowing owl	Santa Cruz River	
<i>Pipilo aberti</i> Abert's towhee		
<i>Vireo belli</i> Bell's vireo		
<i>Buteo swainsoni</i> Swainson's hawk		
<i>Glaucidium brasilianum cactorum</i> Cactus ferruginous pygmy-owl		
<i>Terrapene ornata luteola</i> Desert box turtle		
<i>Cnemidophorus burti stictogrammus</i> Giant spotted whiptail		
<i>Sonora semiannulata</i> Ground snake		
<i>Thamnophis eques megalops</i> Mexican garter snake		
<i>Rana yavapaiensis</i> Lowland leopard frog		
<i>Gila intermedia</i> Gila chub		
<i>Sonorella sp.</i> Talus snail		
<i>Coryphantha scheeri robustispina</i> Pima pineapple cactus		
<i>Tumamoca macdougalii</i> Tumamoc globeberry		

Existing Stressors

Activities contributing to biological stress are aquifer overdraft due to pumping for urban use and agriculture, urbanization of the Tucson Basin, wildcat subdivision in outlying areas, construction of roadways and utility corridors, wash channelization, diversion of stream flows, aggregate mining of watercourses, and increasing recreational use of open space areas. Ground water pumping in areas of remaining shallow water are a primary concern, especially in Tanque Verde and Sabino Creek watershed.

Overuse of public lands has resulted in habitat loss and degradation. Careless recreational use results in numerous wildcat roads and trails used by off-road vehicles. Public lands throughout this subarea have increasing problems with invasive species, roadkill, and wildlife disturbance.

Ranching

The entire Santa Cruz Valley, including the Tucson area, was historically one of the most significant ranching valleys in southern Arizona. The river and its floodplain were a focus of Native American settlement and agriculture, the historic corridor of Spanish Colonial exploration and mission settlement and the location of Spanish and Mexican period land grants. These factors established some of the first ranches in southern Arizona.

In the Tucson Basin, the mission settlements of San Xavier and San Agustin del Tucson were the principal areas where cattle ranching began with the introduction of cattle by Father Kino in the late 1690s. Kino brought cattle in large numbers to his Arizona missions. The cattle attracted Indian attacks limiting the cattle ranching and human settlement to areas around the immediate vicinity of the missions near the Santa Cruz River.

By the time the presidios at Tubac and Tucson were established in the mid 1700's cattle herds were already well-established in southern Arizona and basic to the subsistence of both Spanish colonists and their Indian allies, and the Apache took advantage of the cattle for their own needs through raiding.

The mission lands were nationalized in 1834, and largely abandoned to the Pima Indians until the American period. Apache warfare was such that by the 1840s, most Mexican ranches were abandoned and the few remaining settlers were huddled about the presidio at Tucson. Cattle ranching as an industry ended and the few remaining animals were left to the wild. In the 1850's wild cattle were exterminated from southern Arizona due to their continuous slaughter by Apaches. As a result, cattle died out from the landscape.

Due to continued growth and development and the urbanized nature of the Tucson Basin and its development trends along Interstate 10 and 19 corridors, ranching barely continues in the Middle Santa Cruz Valley. Those areas where ranching does exist are discontinuous and limited to portions of the Coronado National Forest and in the far Southeastern portion of the valley at the eastern edge of the City limits. Environmentally, the remaining ranch land tends

to be located in the upland areas near Redington Pass in the Santa Catalina Mountains and in lower elevation areas characterized by creosote-bursage and desert scrub vegetation.

Cultural and Historic Resources

Archaeological investigations indicate that people have occupied southern Arizona for at least 11,000 years. Three major prehistoric archaeological time periods, Paleoindian, Archaic, and Hohokam are recognized in the Middle Santa Cruz region. Prehistoric sites were predominantly Hohokam sites (ca. A.D. 700-1450), but some sites dating to the earlier Archaic Period (ca. 5000-1000 B.C.) are also present.

Late Archaic sites have recently been found to represent habitation in the Tucson Basin in areas along the Santa Cruz River with reliable water. Given the water reliability in Tucson, it is possible that the urban area has seen nearly continuous occupation for the last 3,000 years, if not longer. Increasing reliance on agriculture and the beginnings of ceramic technology mark the transition to what archaeologists have termed the Hohokam sequence of occupation.

The Hohokam were a sedentary agricultural society who constructed houses built in shallow pits and later as above ground pueblo-like structures of rock and adobe. Agriculture intensification is evidenced by the use of the irrigable floodplain, as well as the use of upland areas where dry farming and cultivation of agave became increasingly common. By the Late Classic period, many of the villages were abandoned, and populations aggregated into a smaller number of large integrated pueblo communities typically enclosed by a compound wall. While the decline of the Hohokam are not fully understood, stresses may have environmental limits to food production, increased population pressure, conflict from changes in political and trade alliances, and perhaps social and religious issues. By the end of the Classic period in A.D. 1950, the great cultural traditions of the Southwest, the Hohokam, Anasazi, and Mogollon, ended and populations dispersed.

Following the demise of the Hohokam, the periods that followed are not well documented or understood. The archaeological record suggests population groups that followed were sparse and small in size to allow for easier mobility. By the time the Spanish arrived in the 1690s, these people were identified linguistically as northern Pimans. Settlements were dispersed into small groups living along river courses pursuing an agricultural economy supplemented by hunting and gathering. Despite these considerable changes, the Pima and Tohono O'odham consider the Hohokam their ancestors, as do some of the Hopi clans.

The first Spanish explorers came to southern Arizona in the 1690's. Father Kino brought significant changes in social and economic life as well as religious beliefs. Within the Santa Cruz Valley, he established a mission at Tumacocori and a northernmost mission called San Xavier del Bac that served the Tucson area.

With growing unrest among the Piman mission communities and increased pressure from Apache raiding, the Spanish military assumed power over the Santa Cruz Valley communities. In 1775, when the Apaches focused their raiding on mission villages, the Tubac presidio was relocated to Tucson, and the mission villages were "reduced" to Bac and Tucson.

Recreational Resources

Recreation demand within the Middle Santa Cruz Subarea is met by urban parks as well as by the public land that surround the basin. The Tucson Mountain Park, Coronado National Forest, and Saguaro National Park all receive increasing use with some seasonal variability. Hiking trails are found within all these areas and frequently follow watercourses into upper elevations. Certain areas, such as Sabino Canyon, Mt. Lemmon, Redington Pass and Agua Caliente Park are used intensively and have issues with indiscriminate and irresponsible use.

Agua Caliente Park located on the far east side of Tucson, and is unique to the area. The park offers established picnic areas, a walking trail, and great wildlife viewing opportunities. There is no hunting or fishing allowed.

Tucson Mountain Park accommodates camping within the Gilbert Ray Campground, hiking, biking and equestrian use on designated trails, birding, and scenic viewing opportunities. Archery hunting is permitted in accordance with Game and Fish regulations.

Human over-use in and around public lands frequently results in the introduction and spread of non-native and invasive plant and animal species. The presence of introduced species, including dogs and other domestic animals, is an ongoing problem attributed to the increased public use and continual encroachment from urban development.

Existing Policies

Tucson Mountain Park--Tucson Mountain Park (TMP) is the oldest park administered by the Pima County Parks and Recreation Department, and many of the policies that now apply to other parks were originally established for TMP under Arizona Administrative Code: Title 12 Chapter 12. As duly authorized by State Statute, the Pima County Parks and Recreation Commission has the authority under ARS 11-931 to establish policies applicable to all Pima County Parks. The following codes are applicable to Tucson Mountain Park:

- 12-12-01 Domestic Animals
- 12-12-02 Intoxicants
- 12-12-03 User Fees
- 12-12-04 Use and Occupancy of County Parks
- 12-12-05 Violation and Penalty

Agua Caliente Park--The Agua Caliente Park is open for public use from 7:00 a.m. until sunset, 365 days per year. The park has limited parking and does not accept reservations. The ponds within the park are open for birding and other wildlife viewing opportunities. Fishing, wading and swimming are strictly prohibited within Agua Caliente Park. All wildlife and fish within the park are protected; hunting, collecting and fishing is strictly prohibited. In addition, State and Federal law, as well as park ordinance, strictly protects all historic and prehistoric sites within the park.

For a complete listing of Pima County Reserve Policies, please refer to Tables 15 and 16.

Table 15: Middle Santa Cruz Public Use Policies

Managing Entity	Reserve Name	Public Use Policies													Comments			
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Plinking	Shooting Range	Fishing		Swimming	Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	N	N	R	NA	R	R	Consult Appropriate Agency
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
U.S. Bureau of Land Management	Unreserved BLM	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	
U.S. National Park Service	Saguaro National Park (excluding wilderness area)	Y	N	R	R	R	R	R	R	N	N	N	N	N	NA	R	Y	Fee Area, Backcountry permit required for camping in E. Unit
Pima County	Tucson Mountain Park	Y	Y	Y	Y	N	N	R	N	N	Y	Y	NA	NA	N	N	N	
Pima County	Roy P. Drachman - Agua Caliente Park	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	NA	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Table 16: Middle Santa Cruz Resource Policies

Managing Entity	Reserve Name	Resource Management Policies														Comments					
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.
Varies	Wilderness Areas	R	N	P	N	Y	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y
U.S. Forest Service	Unreserved Coronado National Forest	P	Y	Y	Y	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
U.S. Bureau of Land Management	Unreserved BLM	P	Y	Y	Y	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
National Park Service	Saguaro National Park (excluding wilderness area)	N	N	N	N	N	N	P	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
Pima County	Tucson Mountain Park	N	Y	P	P	N	N	P	Y	Y	N	Y	N	N	Y	Y	Y	N	Y	Y	Y
Pima County	Roy P. Drachman - Agua Caliente Park	N	P	P	P	N	N	P	Y	Y	N	Y	N	N	N	N	Y	N	Y	Y	Y
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Existing Reserves

Tucson Mountain Park

The Tucson Mountain Park (TMP) is an 18,422 acres reserve (Figure 25) located on the western side of the Tucson basin, and is bounded on its northern side by the 24,034 acre Saguaro National Park (Tucson Mountain District). The eastern face of TMP ties into the Middle Santa Cruz Subarea, providing a vital reserve for a number of wildlife species that travel in and out of the city peripheries. The western boundary of TMP is bordered by development and is isolated from inner city reserves and biologically significant lands.

Natural Resources--At the time of its creation in 1929, Tucson Mountain Park was a rural preserve. Today, the once-rural character of the land surrounding the park is virtually a memory. The beauty of the Tucson Mountains, and the appeal of being located on the edge of a permanently-protected natural area, have attracted residential development of all kinds, as well as commercial development such as golf courses and the Starr Pass Resort. In addition, a new 160-room resort and conference center has been proposed for construction near the corner of Gates Pass Road and Camino de Oeste.

Urbanization is in the process of surrounding the park, and this, coupled with a dramatic rise in the value of adjacent undeveloped land, has limited the expansion options for the park. The Sonoran Desert Conservation Concept Plan recognizes the fundamental importance of Tucson Mountain Park in the County's overall resource conservation strategy, and seeks to maintain its existing viability as a natural preserve and to enhance its functionality wherever possible. Toward that end, the acquisition of approximately 3,615 acres of high-resource adjacent open lands has been discussed in the interest of accomplishing the following specific goals:

- Preservation of significant wildlife habitat, particularly natural washes;
- Establishment of perpetually-protected biological linkages between the park and nearby tracts of natural open space, including Greasewood Park, Tumamoc Hill, and the Santa Cruz River corridor. These linkages will reduce the likelihood that Tucson Mountain Park will become an isolated "biological island" surrounded by development, facilitate natural wildlife movement, and help assure the health of the wildlife populations in the Tucson Mountains;
- Protection of noteworthy scenic resources on the periphery of the park, including landmark peaks, ridges and other "signature" features such as the Twin Peaks along Anklam Road and Gates Pass Scenic Corridor;
- Assurance of adequate public access to the park, both to make this regional county park available to the citizens of Pima County, and also to disperse use throughout the park as much as possible in order to lessen cumulative user impacts on natural resources; and
- Preservation of cultural resources.

The achievement of these goals will be aided by two important sources of funding: the 1997 Open Space Bond Program, and the Starr Pass Environmental Enhancement Fund. The 1997 Open Space Bond Program provided a total of \$6.65 million to facilitate the purchase of valuable open space adjacent to the park.

These funds include \$3 million to acquire parcels along Gates Pass Road, at the western end 36th Street, in the Twin Hills area, and adjacent to Tucson Unified School District's Camp Cooper; \$1.8 million for parcels in the Painted Hills area between Anklam and Speedway, and \$1.75 million for parcels in the Robles Pass area south of the Ajo Highway. An additional \$500,000 was provided to acquire up to 125 acres at the northern end of the Tucson Mountains near Continental Ranch to protect valuable archeological resources -- including the *Los Morteros* site and scenic resources.

The other principal source of funding, the Starr Pass Environmental Enhancement Fund, was created to help mitigate the impacts of the Starr Pass resort on Tucson Mountain Park. The Fund, derived from a sales tax increment collected at the resort, is expected to provide a total of approximately \$18.6 million in revenues over a 20-year period to benefit Tucson Mountain Park. The Starr Pass funds will be used to acquire open space parcels adjacent to the park and facilitate the creation of biological corridors.

In addition, an Arizona Preserve Initiative (API) application is being prepared to facilitate the conservation reclassification and eventual acquisition of two parcels of State Trust Land adjacent to the park -- a 60 acre parcel immediately north of Trails End Road in Section 2 of T14S, R12E, and a 40 parcel just south of the Ajo Highway in Section 33 of T14S, R13E. The application is expected to be completed in August, 1999 and will be submitted to the State Land Department.

Tucson Mountains Biological Corridor. Another significant component of the Sonoran Desert Conservation Concept Plan's suggestion to protect and enhance Tucson Mountain Park is the creation of the Tucson Mountains Biological Corridor. The corridor is series of adjacent parcels of natural open space and desert washes intended to link Tucson Mountain Park with other significant protected open lands in the Tucson Mountains area -- including Greasewood Park, Tumamoc Hill, and, ultimately, the Santa Cruz River. The Biological Corridor has four major components: the connection from the Trails End Road vicinity to Greasewood Park; the linkage from the Starr Pass area to Tumamoc Hill; the link between Robles Pass and the Santa Cruz River, and the connection of the Roger, Trails End, Camino de Oeste, Anklam and Enchanted Hills washes, which flow out of Tucson Mountain Park, to the Santa Cruz River. The development of the corridor is presently underway, and is discussed in detail in the Linkages section of this report. A map depicting the Tucson Mountains Biological Corridor can be found on the next page.

Existing Condition -- At the time of its creation in 1929, Tucson Mountain Park was truly a rural natural resource preserve. Tucson's population at that time was just over 30,000, and the "urban core" of the Old Pueblo was a considerable distance from the park. Seventy years later, Tucson is a very different place. The population of metropolitan area is nearly 800,000,



John Dell

Gates Pass, Tucson Mountain Park

and Tucson Mountain Park is now virtually surrounded by urbanization. Park visitation has increased significantly over the years, and an estimated 1.2 million vehicles pass through the park every year. An increasing number are commuter vehicles, while others, including large commercial transports such as tour buses, are on their way to attractions like the Arizona-Sonora Desert Museum, Old Tucson, or Saguaro National Park's Red Hills Visitor Center.

Almost every conceivable type of residential development can be found in the immediate proximity of the park, from the million-dollar estates in the Trails End area to the manufactured homes in Tucson Estates. Commercial development also dots the periphery of the park, and includes the Starr Pass Golf Course and its planned resort, the strip malls lining Kinney Road, and the fast food and convenience stores along the Ajo Highway. In addition, a 160-room resort and conference center has been proposed for the corner of Gates Pass Road and Camino de Oeste just a few hundred feet from the park, and another golf course will eventually be constructed immediately adjacent to the park's southern boundary along Sarasota Road.

Today the park is threatened by a proposal to run a large, high-voltage power line west of the park and through the Wildlife Mitigation Corridor.

It is clear that the pattern of increasing urbanization in the vicinity of the park will persist in the future. The east side of the Tucson Mountains remains a very popular area, and with a variety of residential and commercial projects in various stages of development, will undoubtedly continue to expand. Several new residential projects are under construction on the south side of the park along Kinney Road, and the large-scale Tucson Mountain Ranch project is expected to get under way in this area soon. In addition, the lands north and west of Tucson Mountain Park and Saguaro National Park West are also poised to grow at a significant rate as the populations of the Avra Valley and town of Marana continue to swell.

History--For the most part, the resources within the Tucson Mountain Park have been managed well and protected from the impacts of growth related stresses. Over the years, the park has had to deal with numerous changes. During the 1950's, a campaign to continue mineral extraction within the park was defeated, with the creation of the Tucson Mountain District of Saguaro National Park as an outcome. In 1970's, the micro towers and their supporting utility lines were an issue. The fight against the installment of these radio towers in the Tucson Mountains was eventually lost in court. The overhead utility lines and towers are highly visible within the park. During the late 1970's, the U.S. Bureau of Reclamation and Tucson Water proposed to store water from the Central Arizona Project within a surface lake in the park. This proposed lake was one of the most controversial and highly contested issues to date.

Vegetation-- The Sonoran Desert Conservation Plan provides an unparalleled opportunity to protect the Tucson Mountains and their valuable resources. The vegetation of the Tucson Mountains is described as having characteristics of Subtropical Desertland, Creosote Bush, Creosote-Bursage, Palo-Verde-Saguaro, and Jojoba Mixed Scrub. Ironwood trees are also found within TMP. Whatever the plant species association, the Tucson Mountains provide diverse habitats that need to be protected by the Sonoran Desert Conservation Plan.

No federally listed threatened or endangered plant species have been positively identified to date within the Tucson Mountain Park, but several uncommon species, including night-blooming cereus and Tumamoc globeberry, are known to occur. Large stands of saguaro can be seen throughout the park, with the highest population near Brown Mountain. The western part of the park does not have as high a percentage of saguaros as that of the eastern part, according to former Natural Resource Park Superintendent, Gale Bundrick. The giant saguaro has historically provided a staple for many of the Native Americans as well as a food supplement for numerous wildlife species. The regeneration of saguaro cacti, as seen throughout much of the Tucson Mountains, is a positive sign of a healthy Sonoran Desert Ecosystem. It is important that preservation efforts continue in order to protect this resource.

Wildlife--A number of the larger mammals such as the mule deer, mountain lion, javalina, coyote and bobcat are found within the park. These more mobile species depend on movement corridors in order to maintain a diversified gene pool. Without the ability to move in and out the Tucson Mountain Park, these animals may eventually succumb to the weaknesses of inner breeding. Ultimately, the Sonoran Desert Conservation Plan can play an important role in helping to secure the biological movement corridors and a healthy wildlife population.

Archery hunting is permitted within Tucson Mountain Park under the purview of the Arizona State Game and Fish Commission. Archery hunting is believed by many to be a compatible recreational use and viable management tool. However, over the last decade, more and more conflicts have arisen between hunters and other park users.

In addition to hunting, The Arizona Game and Fish Commission has legal jurisdiction over all wildlife on State Lands. Counties are sub-entities of the State; therefore, all wildlife species within the Pima County reserves fall under state authority. Resource management at the local level does not always coincide with state regulations. For example, the collection and removal of certain reptiles is permissible pursuant to the Arizona Game and Fish Commission Order Number 43, but not under the management restrictions of the Pima County Parks and Recreation Department. This conflict is not easily resolved due to complexity of local issues versus the much larger State of Arizona.

Cultural Resources--The Tucson Mountains contain a variety of cultural resources, including historic structures and prehistoric archaeological sites. Very little of the park has been professionally surveyed for cultural resources; however, the Depression-era complex of facilities designed for Tucson Mountain Park has been determined eligible for listing on the National Register of Historic Places.

The Civilian Conservation Corps (CCC) of the mid-1930's was responsible for some of the more noticeable improvements within Tucson Mountain Park; many erosion control devices were built during this period. As previously mentioned, a systematic recording of all cultural resources is a worthy endeavor yet to be realized. It is of utmost importance that our heritage be preserved and maintained for future generations. Preservation is accomplishable through public awareness, protection and acquisition.

Historic mining sites can be found throughout portions of the entire park; however, the vast majority of the sites are located in the western half of the park within the Avra Valley subarea. Many of the more dangerous mine shafts were sealed off in the early seventies as a safety precaution. The Pima County Sheriff's "Bomb Squad" assisted the Park and Recreation Department with sealing the adits to prevent wildlife and park visitors from the danger of falling into these old mines. The sealing of mine shafts is no longer practiced due to the loss of valuable habitat this resource provides for a number of bat and small rodent species. Instead of demolition, gates and special designed barriers are installed to protect accidental entry while permitting use by cave-dwelling species.

Ranching--Prior to 1974 State Lease Lands existed within the Tucson Mountains. With the successful passing of a community bond program that same year, the Pima County Parks and Recreation Department acquired the last remnants of State Land and grazing was discontinued. However, the Board of Supervisors did grant permission to Mrs. Lovelace, a former leaseholder of the State, to continue grazing a maximum of 25 goats until they could be sold. The practice continue for a few months until a migratory mountain lion, believed to be from the Baboquivari Mountains, killed most of her remaining herd within one week period.

Recreation--Tucson Mountain Park has over 1 million visitors per year who come for its commercial attractions (Old Tucson and Arizona-Sonora Desert Museum) as well as its multiple recreation resources. The park has a 150-space campground where both primitive and improved sites are available. The campground generates revenue for the park's operation through its daily fee system. Aside from the commercial operations, Gilbert Ray Campground generates more revenue for Tucson Mountain Park than any other recreation use.

Two shooting ranges offer both the gun and archery enthusiast an opportunity to practice their skills. The 100-yard shooting range, located near the Kinney Road entrance to the park, is open on weekends for both rifle and pistol use. Shotguns and automatic weapons are not permitted on this range. Like that of the campground, revenue generated from the use of these two ranges help to offset the annual cost of maintaining this 18,000-acre public reserve.

Twenty-six miles of trail are found within Tucson Mountain Park. Most of the trails are currently open to multiple-use (hiking, biking and horseback riding). The park has yet to master plan its trails system. A number of trails currently being used for multiple-use are not suited for this type of high impact use. A plan to inventory all trails and develop a management plan for their use is planned for the fiscal year 2000-2001. Voters in the 1997 bond election approved a number of new trailheads. Those planned within this subarea are the Camino De Oeste, Starr Pass and 36th Street entrances to the park's trail system. In addition, two new trailhead-parking areas will be built by developers as part of projects they are planning along the Kinney Road entrance to the park.

Roy P. Drachman-Agua Caliente Park

Roy P. Drachman-Agua Caliente Park is a 101-acre facility (Figure 27). The Park was acquired by Pima County with public support and a significant donation from Roy P. Drachman in 1984. The park was open to the public in January, 1985.

Nestled in northeast Tucson, the park provides visitors a unique recreational experience with dramatic views of the Santa Catalina Mountains. The Agua Caliente perennial spring supports three ponds with diverse vegetation and wildlife. The spring makes this park unique in the Tucson Basin, and it has a long history of settlement.

Vegetation within the developed portion of the park is a mix of introduced and native species that includes mature mesquite trees, palm trees, oleanders and eucalyptus trees. Improvements made to the park in 1997 allowed for the planting of additional trees and shrubs which were incorporated into the established vegetation. Undeveloped buffer areas within the park support native vegetation and grasses, allowing a corridor for wildlife.

The Agua Caliente Spring is a source of perennial water. This feature, along with associated riparian plant communities, attracts many vertebrate species. Wildlife found in the park include mule deer, javelina, grey fox, raccoons, bobcat, ring-tail cat, skunk, and reptiles. Many species of birds are found in the park including raptors and migratory species. Fish are found in all three spring-fed ponds. The fish species include large mouth bass, blue gill, tilapia, grass carp, mosquito fish, koi, and goldfish. Sonoran mud turtles, and several other species of non-native turtles are also found in the park.

History--Near the end of the Archaic Period, the beginnings of agriculture and settlement of established communities are found in the Tucson Basin. The Hohokam established distinctive settlement patterns about this time. While the early phases of the Hohokam are not well represented in the Agua Caliente region, a later site was found around A.D. 1150. The Whiptail Site was established at this time, and the area around Agua Caliente experienced intensive occupation for the next 150 years. After this time, little is known about the happenings in the Agua Caliente region until the late 1800's.

The Agua Caliente Springs were used as an encampment by soldiers before and after the Gadsen Purchase (1853), and up until the time of the ranching days of the early 1870's. In 1873, John D. Fuller established a cattle ranch and orchard at Agua Caliente. The first structure built on the site was an one room adobe ranch house. In the 1880's, Fuller developed the area into a health resort and built additional buildings, although little trace of the development remains.

The property was then purchased in the early 1920's by Willard White, who planned to build a large resort with a lake, pool, golf course, tennis courts, and a two-story hotel with accompanying bungalows. There is no physical evidence at the park that this plan was actually carried through.

In 1935, Gibson De Kalb Hazard purchased and operated the property as a working ranch, raising cattle, alfalfa, and fruit. This property continued to be used as such until it was purchased by the Filiatrault family in 1951. The main house was expanded and 5 smaller ponds were established, making the total 7. Small bridges connecting the ponds were installed.

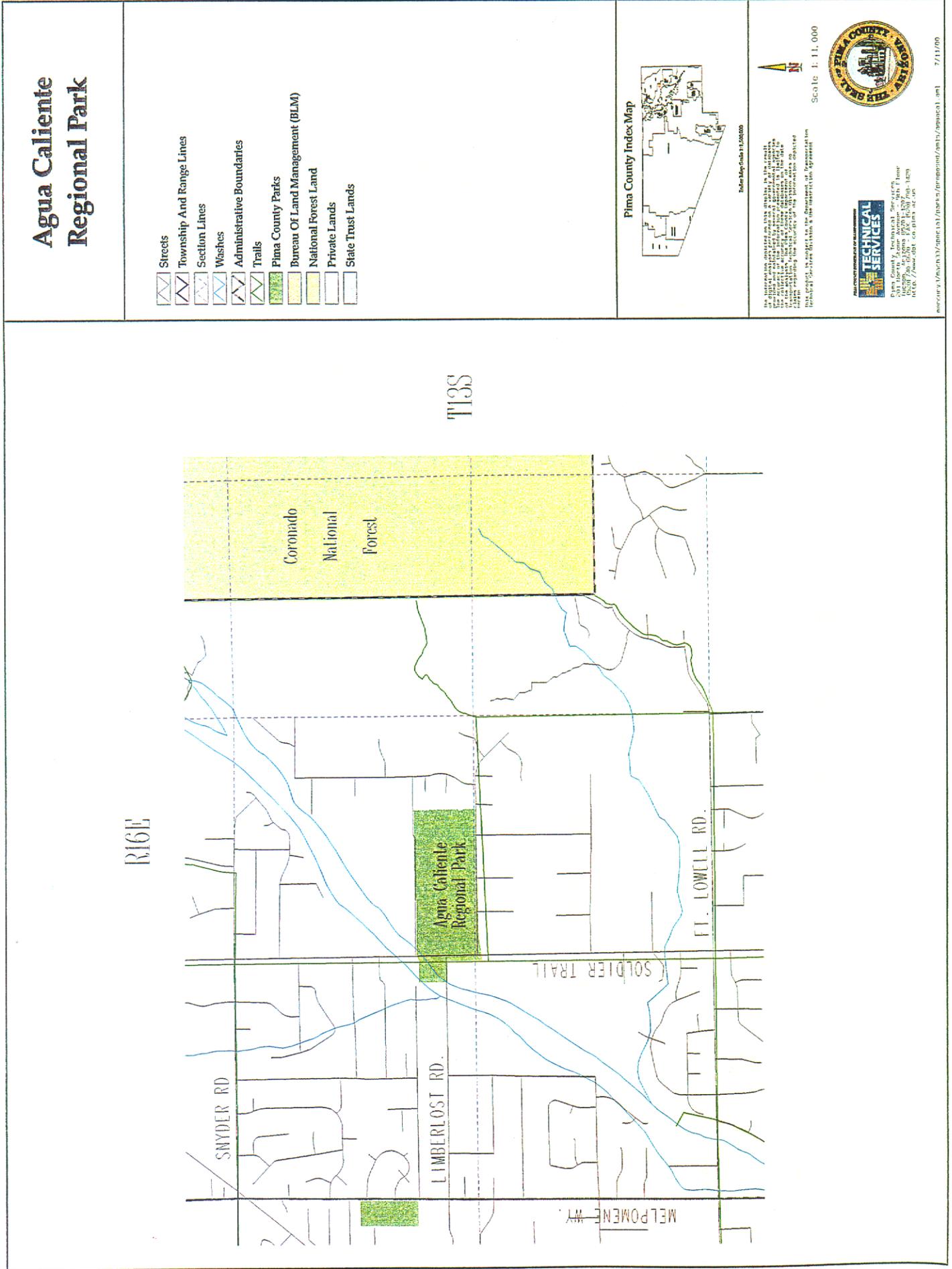
In 1959, the property changed hands again, and was sold to the Myriad Research and Development Company. Although there were plans to build a 15 million dollar lakeside community with over 300 homes, the development never materialized. In 1984, Roy Drachman donated \$200,000 towards the purchase of Agua Caliente by Pima County Parks and Recreation. The park opened to the public in 1989.

Potential as a Native Fishery--The ponds and streams have existing habitat for several species of rare and endangered native fish and amphibians. The removal of existing non-native species of fish and amphibians is needed, as well as some minor habitat modifications.

If management changes in existing ponds and streams are not possible or not recommended, other options may exist. There are several ponds no longer connected to the spring or other ponds. These old ponds could once again be allowed to fill with water and used exclusively as a native fishery. This could provide the public with a great opportunity to see the native fish of Arizona. The main difficulty would be the exclusion of non-native fish from the native fishery ponds.

The 1989 Agua Caliente Master Plan includes plans to create a pond and stream system designed for, and stocked with, native fish. The native fish waterway would serve as a preserve and breeding fishery for rare, threatened, and endangered species of native fish. In any case, the Arizona Game and Fish Department would have to fully support and direct the introductions of native fish.

Figure 27



Opportunities for Protection

The Open Space Acquisition Master Plan and Staff Report (January 2000) has identified the following parcels of land for open space acquisition.

- SD-1--Tucson Mountain Park-General: 600 acres have been identified as critical areas that harbors significant resource values, is within cactus ferruginous pygmy owl critical habitat, and is experiencing significant development pressures. The areas are Gates Pass, Twin Hills, 36th Street and Camp Cooper. Because of its importance, acquisitions have been proposed under SD-1. Bond funding was approved for \$3 million dollars, with additional funding available through the Starr Pass Environmental Enhancement Fund. The Board of Supervisor's have also approved a combined API application, which would affect SD-3 TMP-Robles Pass. There is no current estimated acquisition cost for the API application, one-half of which could be funded through a Growing Smarter grant.
- SD-2--Tucson Mountain Park-Painted Hills: The Painted Hills area is experiencing extremely rapid development. Three properties have been identified for priority acquisitions. These properties have been selected to retain scenic value and protect wildlife corridors to the Santa Cruz River. Because of their development potential, these properties have a high price tag (\$4.7 million), exceeding the bond funding of \$1.8 million. These properties are separated from TMP by a considerable distance and would remain separated by Anklam Road. The high cost and fragmentation reduce the properties value when measured by the goal of expanding and consolidating the Park and creating links to biological corridors. Staff analysis has recommended a property in SD-1 as a more suitable acquisition.
- SD-3--Tucson Mountain Park-Robles Pass: The three parcels, totaling 746 acres, are along the Ajo Highway immediately south of Tucson Mountain Park. The area has been identified for acquisition to protect a key scenic gateway into the Tucson metropolitan area. This property can also help preserve significant wildlife habitat and a wildlife migration corridor in a rapidly growing area, and provide additional trails-based recreation opportunities for southside residents. The protection of this property would help provide a link to the Pima County-administered Manzanita Park to Tucson Mountain Park. Significant development is underway in the area, with a large quantity of manufactured houses. Combined, the three parcels have zoning that will allow up to 496 lots. The bond authorization has a funding of \$1.75 million. The market value of the properties is \$4.1 million. Negotiations with the property owners are underway.
- SD-10--Tumamoc Hill: The SD-10 has a bond funding of \$1.4 million for the land acquisition of 320 acres east of Greasewood, buffering the University of Arizona's Tumamoc Hill research site. The U of A has secured approval of an API application, redesignating the state land for conservation purposes and effecting its Tumamoc Hill research site. Pima County has submitted an application to utilize SD-10 to acquire the API designated site.



Gale Bundrick

**Tumamoc Hill,
Tucson Mountain Park**

- SD-9--Mt. Lemmon Highway Base: Three parcels of land were identified for acquisition in this area. These parcels would preserve one of this area's few remaining undisturbed parcels; protect part of the scenic viewshed of the Catalina Mountains, and provide a buffer for the Pusch Ridge Wilderness, a sensitive natural resource area that possesses exceptional habitat and scenic values. Authorized bond funding is \$500,000 for the purchase of 60 acres.
- RW-11--Aqua Caliente Creek: Three parcels totaling 150 acres are proposed for acquisition along the upper reach of Agua Caliente Creek, abutting the Coronado National Forest boundary. The acquisitions relate to the protection of Agua Caliente and La Milagrosa Canyons, two valuable and scenic riparian corridors. Agua Caliente Creek, which emanates from Agua Caliente Canyon and eventually drains into Tanque Verde Creek, is the most significant drainage in the northeast segment of the Tucson Basin. Both watercourses have been identified as areas of shallow groundwater. Available bond funding is \$1.2 million.
- Rw-16--Sabino Canyon: This target acquisition area includes approximately 450 acres near Sabino Canyon. It extends from Snyder Road to the Forest boundary. The acquisition would protect the confluence of Sabino and Bear Creek and the associated riparian and upland habitat, as well as buffer the effects of development on Sabino Canyon. If not protected by some method, the area could accommodate over 90 homes under current zoning.
- RW-17--Tanque Verde Creek: Two parcels totaling 460 acres along the Tanque Verde Creek have been identified for protection. The properties contain high quality riparian vegetation and are perhaps the most densely vegetated undeveloped parcels remaining along Tanque Verde Creek. Due to zoning regulations and multiple land use restrictions, the Open Space Acquisition Review Committee recommends acquisitions not be pursued and encourages a conservation easement program for all of Tanque Verde Creek.

While the parcels identified for Open Space Acquisition are small, they will preserve areas of undisturbed habitat in a growing urban setting, provide buffer zones and habitat corridors to larger reserves, and provide appreciable viewshed values.

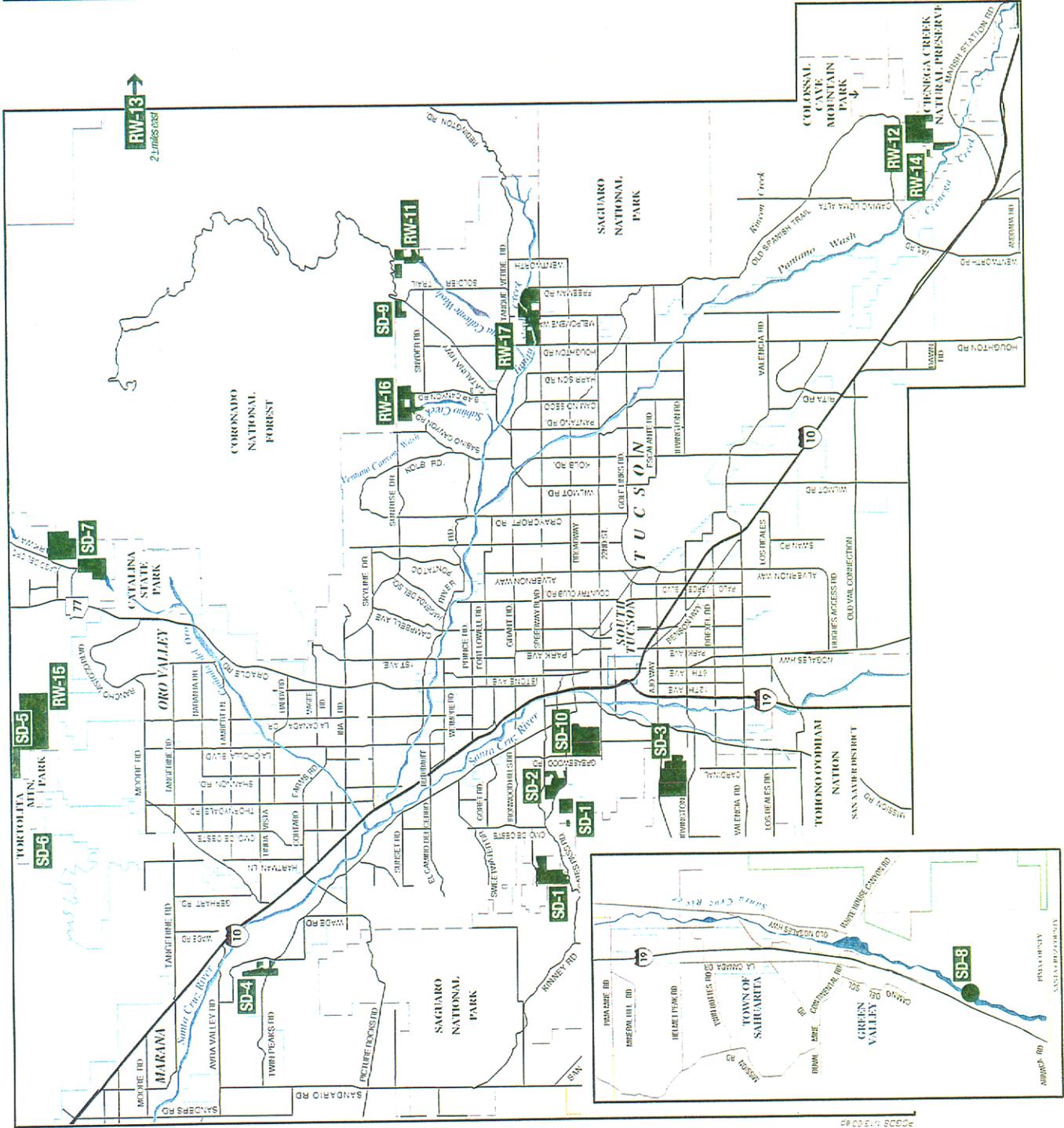
Figure 29

Open Space Bond Program: Target Acquisition Areas

- SD-1. Tucson Mountain Park - General
- SD-2. Tucson Mountain Park - Painted Hills
- SD-3. Tucson Mountain Park - Hobbes Pass
- SD-4. Tucson Mountain Park - Los Morteros
- SD-5. Tortolita Mountain Park
- SD-6. Tortolita Ironwood Forest
- SD-7. Catalina State Park Expansion
- SD-8. Canoa Ranch
- SD-9. Mt. Lemmon Highway Base
- SD-10. Tumamoc Hill
- SD-11. Tortolita Shooting Range (not shown on map)
- RW-11. Agua Caliente Creek
- RW-12. Agua Verde Creek
- RW-13. Bingham Glenega
- RW-14. Glenega Creek
- RW-15. Upper Honeybee Canyon
- RW-16. Sabino Canyon
- RW-17. Tanque Verde Creek

NOTE: SD-11 On hold due to Pygmy Owl studies

OPEN SPACE BOND PROGRAM:
TARGET ACQUISITION AREAS

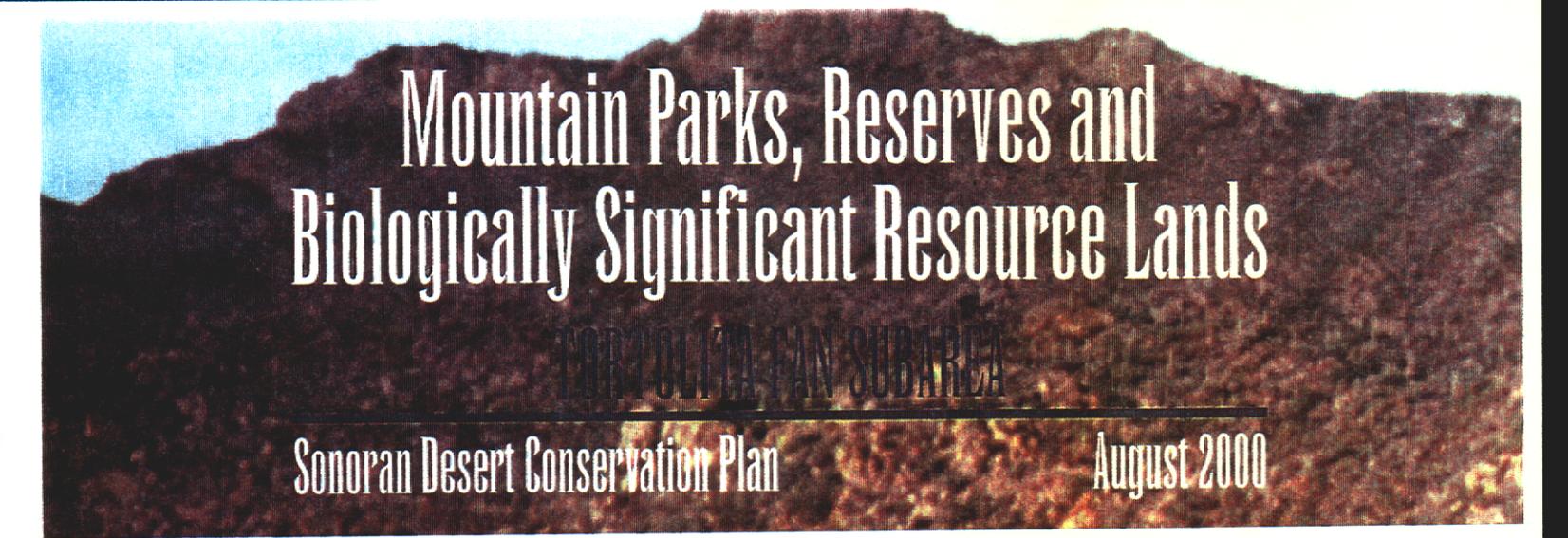


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Applicable Planning Documents

The following planning document contain information pertaining to the proposed Tucson Mountain Expansions and/or the area surrounding the park.

- Eastern Pima County Trail System Master Plan (1992)
- Pima County Comprehensive Plan (1992)
- Open Space Bond Acquisition Master Plan (2000)



Mountain Parks, Reserves and Biologically Significant Resource Lands

PORTUOLA, SAN SUBAREA

Sonoran Desert Conservation Plan

August 2000

Introduction

The Tortolita Fan Subarea has changed dramatically over the past twenty years. Once an area of rural homesites separated by large tracts of undisturbed and undeveloped land, the Tortolita Fan is now a landscape of numerous subdivisions, master-planned communities and commercial developments. To the east lies the Town of Oro Valley and its massive Rancho Vistoso development. To the northeast, straddling Oracle Road, is the Town of Catalina which is anticipated to see large-scale development in the coming decades. The community of Saddlebrooke already exists in this area. Marana, and the expanding corridor between Tucson and Casa Grande, form the western boundary of this subarea. Development in this subarea occurs in areas of significant environmental resource value, including high-density ironwood forest and critical habitat of the cactus ferruginous pygmy owl.

In an area with so many governing jurisdictions, habitat fragmentation and loss due to inconsistent protection policies is an unfortunate reality the Sonoran Desert Conservation Plan is trying to overcome. As significant State land holdings in this subarea are converted to urban uses, comprehensive and regional planning efforts will help to ensure development goals are balanced with environmental conservation.

Many significant washes and riparian areas flow from the Tortolita Mountains and terminate downstream in the major washes of the Tucson Basin. In addition to the direct impacts from development, the associated groundwater pumping to support this growth significantly deteriorates vegetation, particularly in the riparian habitat areas, that support the highest diversity of wildlife species.

The Tortolita Fan Subarea has had intensive archaeological survey and site excavation, making it the best known of all the subareas. Based on this record, it is evident humans have occupied the area for many thousands of years with a peak occupation period between A.D. 200 and A.D. 1300. In addition to its prehistoric resources, this subarea has several places of historic interest including occupied historic communities, National Register of Historic Places properties and two historic trails.

The Sonoran Desert Conservation Plan proposes expansion of the Tortolita Mountain Park from its existing 3,445 acres to a much larger reserve of more than 40,000 acres. In addition, the proposed 3,441 acre Tortolita East Biological Corridor consisting almost entirely of State Trust Land will link the proposed Tortolita Mountain Park with Catalina State Park and protect key segments of significant wash corridors. Catalina State Park is also proposed to expand by an additional 2,320 acres thereby sharing a larger border with lands managed by the Coronado National Forest. Figure 30 shows the Tortolita Fan subarea in relation to existing reserves.

Figure 30

Tortolita Fan

SDCP PLANNING AREA 5

-  Major Streets
-  Major Washes
-  Sub-Area Boundary
-  PWS Pygmy Owl Critical Habitat Units
-  Coronado National Forest
-  Pusch Ridge Wilderness Area
-  Butterfly RNA
-  Catalina State Park
-  Saguaro National Park West
-  Saguaro National Park West Wilderness Area
-  Santa Catalina RNA
-  Tortolita Mountain Park
-  Ironwood forest National Monument
-  Wildlife Corridor Links

Pima County Index Map



Index Map Scale: 1:250,000

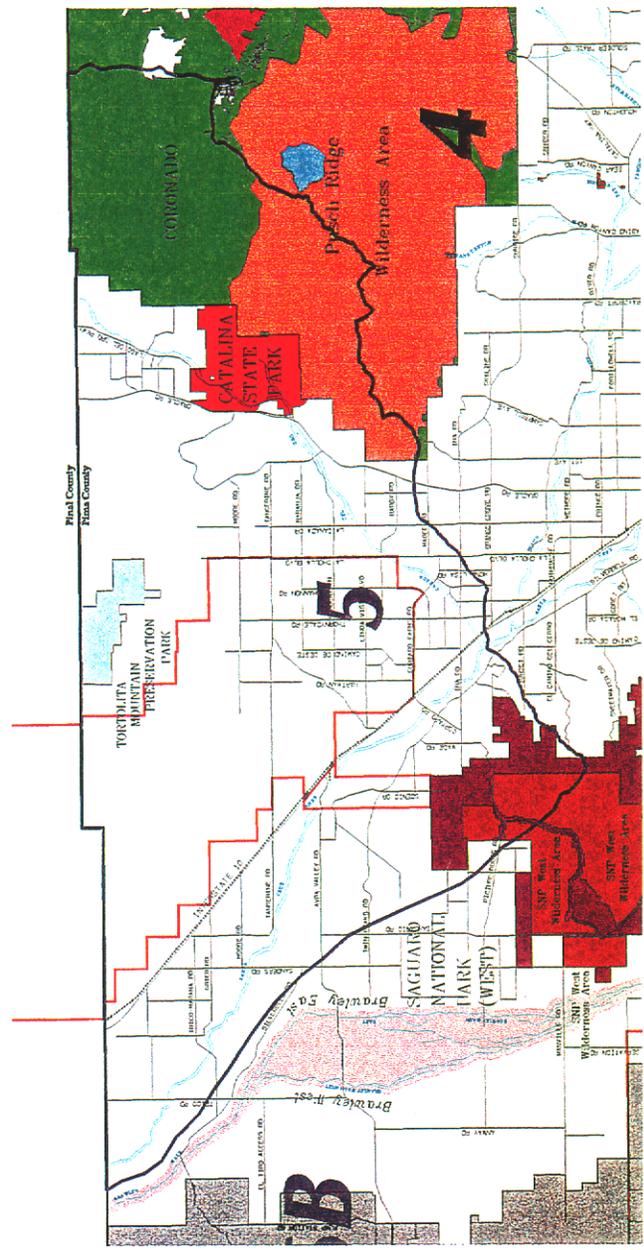


Scale: 1:100,000



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Approved by Pima County Board of Supervisors on 12/15/2010



GAP Status of the Tortolita Fan Subarea

The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 17).

The Tortolita Fan Subarea has 54,934 acres of reserved land, including lands managed by the U.S. Forest Service, U.S. National Park Service, Arizona State Parks, and Pima County (see Table 17). Reserved lands totals 27 percent of the subarea. Land outside of existing reserves, (unreserved Status 4 lands), including private, state, or other land have a total of 148,592 acres.

The addition of 40,102 potential reserve acres would total 95,036 acres of protected land, or 47 percent of Subarea 5 in Status 3b or higher. The remaining 53 percent is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the Multi-species Habitat Conservation Plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 18 lists the priority vulnerable species.

Vulnerable Biological Features

Habitats most at risk include Critical Habitat for the cactus ferruginous pygmy-owl, the remaining ironwood forests, riparian and xeroriparian areas, stream segments with perennial flows, and areas of shallow groundwater. Table 18 lists priority streams and springs found in this subarea.

Potential Stressors

Potential stressors in this area are derived from threats associated with development. Once an area of rural homesites, the Tortolita Fan area now has numerous subdivisions, lot-split areas, master-planned communities, and commercial developments.

Table 17

Existing Reserves of the Tortolita Fan

Land Manager	Existing Reserves	Total Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
U.S. Forest Service	Coronado National Forest	23,554					x	
	Pusch Ridge Wilderness Area	14,363		x				
U.S. National Park Service	Saguaro National Park west	5,516		x				
	Saguaro National Park West Wilderness Area	2,985	x					
Pima County	Tortolita Mountain Park	3,001			x			
Arizona State Parks Board	Catalina State Park	5,515			x			
	Total Acres of Existing Reserves	54,934						
	Total Acres of the Tortolita Fan subarea	203,546						

Potential Reserve Expansions in the Tortolita Fan

Land Manager*	Potential Reserve Expansions **	Total Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Arizona State Parks Board	Catalina State Park expansion	2,320					x	
Pima County	Tortolita Mountain Park expansion	37,782					x	
	Total Acres of Existing and Potential Reserves	95,036						
	Total Acres of the Tortolita Fan Subarea	203,546						

*Managing entities may change with the acquisition of land

**Until further planning is done, the GAP status of potential reserves cannot be known. It is assumed the level of protection will be Status 3b or higher.

Table 18: Tortolita Fan Priority Vulnerable Species, Streams, and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Santa Cruz River	15 spring locations All 15 on U.S. Forest Service land
<i>Lasiurus blossevillii</i> Western red bat	Canada del Oro Lemmon Creek	
<i>Leptonycteris curasoae</i> Lesser long-nosed bat	Wild Burro Canyon Palisade Canyon Creek	
<i>Macrotis californicus</i> California leaf-nosed bat	Sutherland Wash	
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat		
<i>Aimophila carpalis</i> Rufous-winged sparrow		
<i>Athene cunicularia</i> Burrowing owl		
<i>Pipilo aberti</i> Abert's towhee		
<i>Vireo belli</i> Bell's vireo		
<i>Buteo swainsoni</i> Swainson's hawk		
<i>Glaucidium brasilianum</i> <i>cactorum</i> Cactus ferruginous pygmy-owl		
<i>Sonora semiannulata</i> Ground snake		
<i>Chionactis occipitalis klauberi</i> Tucson shovel-nosed snake		
<i>Sonorella sp.</i> Talus snail		
<i>Tumamoca macdougalii</i> Tumamoc globeberry		

Town of Marana

Threats to the biological resources in Marana include habitat loss and fragmentation, conversion of agricultural land to higher intensity uses, and the associated decline in groundwater levels.

Town of Oro Valley

The Town of Oro Valley has experienced a tremendous growth in population. Much of the development has been and continues to be built out within the constraints of master planned communities. The town has strict standards and ordinances for hillside development, native plant preservation, and riparian protection. Primary threats to Oro Valley include habitat loss, habitat fragmentation and groundwater pumping to support the growing population. A large amount of groundwater is also used in Oro Valley to water golf courses.

Community of Catalina

Similar to other communities of this subarea, Catalina is experiencing significant growth in population. The predominant form of residential development is lot-splitting and wildcat subdivision. Threats in this area include encroachment on floodplains and destroyed riparian areas, significant habitat loss, fragmentation, and the introduction of exotic species.

Existing Stressors

Activities contributing to biological stress are mostly attributed to the effects of urbanization, including the roadways and infrastructure to support development. During the last 20 years, this area has experienced rapid population growth and forecasts for the next 20 predict a three to four-fold increase. Much of the planned development is in the cactus ferruginous pygmy-owl Critical Habitat, areas with ironwood forests and relatively dense saguaros, palo verdes, and mesquite bosques. Channelization of small intermittent watercourses has resulted in loss of vegetation and habitat in upland and riparian areas. Modification of watercourses, with the loss of xeroriparian and upland vegetation can transform an area of rich biodiversity into one of low biodiversity.

The rapid growth in population has led to increased groundwater pumping. Stress on biological resources due to declining groundwater tables include deterioration of vegetation, particularly riparian communities, which support the highest diversity of wildlife species.

The subarea is well developed and roads fragment much of the southern and western portions. Areas in the north and east portion of the subarea are relatively unfragmented.

Ranching

Ranching activity in the Tortolita Fan Subarea has been relatively limited since the modern settlement of the Tucson Basin began in the 19th century. Several factors account for this restricted level of activity. First, the grazing capacity of the Tortolita Fan is not profound; insufficient forage exists to support substantial quantities of livestock. Second, water is very

scarce in the region. Permanent, reliable natural water sources are virtually non-existent in the Tortolita Fan subarea. Finally, pioneer ranchers faced a serious threat from Apache raiders for several decades in the mid-1800s, making ranching in the area as perilous to personal safety as it was commercially difficult.

Despite the extremely challenging conditions the area presents, the Tortolita Fan has a long--if not entirely successful--ranching history. The first ranch in the region was established in 1844 by Francisco Romero and his wife Victoriana in the Canada del Oro Valley. The ranch was abandoned in 1870 after Romero lost his entire inventory of livestock in a single year. The ranch was revived in 1889 by one of Romero's sons, who expanded the ranch to a total area of almost 5,000 acres. Other pioneer ranches include Frank Treat's "Terrible Cattle Company," which was established in the Tortolita Mountains around 1870, the Steam Pump Ranch, which was organized by George Pusch and John Zellweger in 1874, and William Henry Sutherland's ranch, which began its operations in the shadow of the Catalina Mountains near what is now the Sutherland Wash in 1893.

Today, nine ranches are active within the Tortolita Fan subarea, including several in and around the Tortolita Mountains. These ranches include the U Circle, BKW, Catalina South, Rail X, Vaquero, Wong, Smyth, Post, and Twin Peaks operations. Their activities take place on a variety of land types, including private, State Trust, BLM and Forest Service property. All of the ranches but the U Circle Ranch lease State Trust Land, the predominant land type in the region's ranching operations. The U Circle Ranch is situated entirely on U.S. Forest Service lands.

The outlook for ranching is not particularly optimistic in the subarea. Advancing urbanization, particularly in the Marana and Oro Valley areas, threatens the viability of several of the ranches. Some of those most exposed are the ranches located around the Tortolita Mountains, such as the Rail X Ranch. The eastern side of the Tortolitas--particularly the portion in southern Pinal County--and the Oracle Road corridor between Catalina and Oracle are poised for tremendous growth, and this accelerating pattern of urbanization will undoubtedly affect the future functionality of these ranches. The best hope for their continuation will likely come from local government-led conservation efforts. Pima County has filed Arizona Preserve Initiative (API) applications covering almost 26,000 acres of State Trust Land in the Tortolita Fan, and additional acreage is expected to be added in the near future.

Grassroots environmental organizations and the Sonoran Desert Conservation planning team have identified even more Trust lands for protection, including lands capable of providing a biological linkage between the Tortolitas and the Marana area. The intent of Pima County is to allow ranching to continue on the lands included in the API applications, and the formation of partnerships between ranchers and conservationists in the interest of resource protection is a near-term goal.

Cultural and Historical Resources

Cultural resources abound in the Tortolita Fan Subarea. Archeological research in the subarea began in the early 1900s, but only a small number of investigations took place prior to the 1960s. These investigations include those undertaken by Jesse Walter Fewkes in 1908, Ellsworth Huntington in 1910, and Frank Midvale of the Gila Pueblo Foundation in 1929.

Archeological analysis of the subarea intensified in the 1960s and has continued at a significant level since that time. The most influential of these efforts was the Northern Tucson Basis Survey, a major study initiated by the Arizona State Museum in 1980. From 1980 to 1983, the Museum intensively surveyed an area more than 100 square miles in size that reached from the Canada del Oro area north to the Tortolita Mountains, and west to the Santa Cruz River corridor. Several hundred sites ranging in age from the Archaic Period to the Hohokam sequence were identified and recorded as a result of the project. Much of the research that has occurred in the time since the Northern Tucson Basis survey was conducted can be traced directly to its groundbreaking findings. Today, more than 35% of the subarea has been formally surveyed, which makes the Tortolita Fan one of the most intensively examined of all of Pima County's subareas.

The subarea's most impressive archeological sites include Los Morteros and the Marana Platform Mound community. Los Morteros is a large Hohokam village site located at the northern end of the Tucson Mountains that contains a ball court, trash mounds, and hundreds of pit house features located in an area approximately one and a half miles long and a quarter mile wide. The village, which was occupied continuously from 850 A.D. until 1300 A.D., has contributed a great deal to the knowledge base of the Hohokam culture in this period. The Marana Platform Mound village is a 350-acre area located east of the I-10 corridor on the Tortolita alluvial fan, and encompasses or is linked in some manner to literally dozens of significant archeological sites in the surrounding area. According to local archeologists, many questions about the native culture of the Tortolita Fan Subarea have yet to be answered, and securing this knowledge will require that the lands where sites exist be kept intact and protected through in-place preservation.

Historic features also exist in significant numbers in the Tortolita Fan Subarea, and include the historic communities of Marana, Rillito and Catalina, two sites listed on the National Register of Historic Places--the Sutherland Wash Historic District, which encompasses a total of 28 archeological sites, and the Sutherland Wash Rock Art District, a 35-acre site with 12 rock art features--and two historic trails--the Juan Bautista de Anza National Historic Trail, and the Butterfield Stage Line.

The biggest threat to the Tortolita Fan Subarea's invaluable cultural resources is the inexorable push of urban growth, which includes formal platted subdivisions, "wildcat" subdivisions, and the development of individual homesites. The greatest pressures are within the communities of Marana and Oro Valley, but development activity exists throughout this region, including

unincorporated Pima County. Protecting cultural resources as the community continues to grow and prosper will be one of our greatest conservation challenges.

Extensive detailed information regarding the archeological and historic resources of the Tortolita Fan Tortolita can be found in the Sonoran Desert Conservation Plan's *Resources of the Tortolita Subarea* report released by Pima County in May of 2000.

Recreational Resources

The Tortolita Fan Subarea is home to a wide range of outstanding recreational resources that provide opportunities for a broad spectrum of users.

The northern edge of the Tucson Mountain District of Saguaro National Park is within the subarea, and this 24,000-acre jurisdiction offers approximately 50 miles of recreational trails open to hikers and equestrians.

Pima County's Tortolita Mountain Park, located at the northern extreme of the subarea, is presently 3,001 acres in size, but will eventually expand to more than 40,000 acres. Once sufficient land is acquired, the park will eventually feature a trail system open to a non-motorized use pattern--i.e. hikers, mountain bicyclists and equestrians. The park is also likely to feature several trailhead facilities and a public campground or two.

The 5,511-acre Catalina State Park is located on the eastern edge of the subarea, and is one of the most popular outdoor recreational destinations in the region. The park's 14 miles of trails are open to hikers, horseback riders and mountain bikers, and features an extensive equestrian center. The park is also a popular birdwatching site.

The northwestern extreme of the Santa Catalina Ranger District of the Coronado National Forest is also located within the subarea, and this 262,000-acre preserve feature 212 miles of forest roads and 195 miles of trails that are open to hiker, mountain bikers, equestrians and off-highway vehicle (OHV) users (OHV use is allowed in certain designated areas). The park's 56,933-acre Pusch Ridge Wilderness is accessible to hikers and equestrians. Opportunities for backcountry camping are also available in the district.

A considerable quantity of State Trust Land managed by the Arizona State Land Department exists in the area as well. Thousands of acres of Trust Lands surround the Tortolita Mountains alone, and Pima County presently has almost 26,000 acres of Trust property included in its two existing Arizona Preserve Initiative (API) applications for Tortolita Mountain Park. Large amounts of Trust Lands can also be found adjoining the western boundary of the Santa Catalina Ranger District of the Coronado National Forest, next to the northern boundary of Catalina State Park, within the jurisdiction of the Town of Marana, and adjacent to the Tucson Mountain District of Saguaro National Park. Lots of high-quality recreational trails used by hikers, equestrians and mountain bicyclists exist on these Trust Lands--including the well-known 50-Year Trail that begins in Catalina State Park--and these trails are used by large

numbers of local residents. Trail users can legally access Trust Lands for recreational purposes with an annual State Lands Recreation Permit, which is available from the Arizona State Land Department for \$15.

Oro Valley, Marana and Pima County also maintain urban parks in the subarea, some of which contain tracts of natural open space. In addition to a wide variety of typical urban park active recreation features, Pima County's 505-acre Arthur Pack Regional Park includes 265 acres of unspoiled desert with habitat significant enough to attract the endangered cactus ferruginous pygmy-owl. The park is noteworthy for its large quantities of ironwood trees and saguaro cacti.

More than three dozen recreational trails listed on the *Eastern Pima County Trail System Master Plan* cross or are located within the subarea. In addition to the recreational opportunities they provide, these trails serve as critical links in the metro area's interconnected regional trail system. The most significant of these trails include the Santa Cruz River corridor and its developing linear park system, the Juan Bautista de Anza National Historic Trail, which follows the west bank of the Santa Cruz River, the Central Arizona Project Trail, which when complete will link Tucson Mountain Park with Tortolita Mountain Park, and the Canada del Oro Wash, along which another linear park is presently being established.

Another key element of the regional trail system are the trail access points that provide access into Pima County's public lands jurisdictions. Several key access points are located within the subarea, including the Wild Burro Canyon, Cochie, Vulture Peak, Oro Valley and Crow Wash access points into Tortolita Mountain Park, the Scenic Drive access point into Saguaro National Park, and several gates into both Catalina State Park and Santa Catalina Ranger District of the Coronado National Forest. These access points are of critical importance, because they allow the public to enter their public lands and enjoy the trails that existing within these jurisdictions.

The recreational opportunities of the Tortolita Fan Subarea also include hunting. Arizona Game and Fish Units 37A and 33 are located in the subarea, and offer large game hunting of javelina, mule deer, and white-tailed deer, and small game hunting of cottontail rabbit, dove, quail, and tree squirrel. The principal hunting areas in the subarea are the Tortolita Mountains and the surrounding area, and the Western Catalina Mountains. Additional information about hunting in this subarea is available on the Arizona Game and Fish Department's official website.

Existing Policies

Tortolita Mountain Park-- At the present, the Tortolita Mountain Park is an undeveloped park. Until development occurs, the park will be managed as open space lands under the jurisdiction of Pima County Parks and Recreation Department. The following policies exist for the mountain park:

- Tortolita Mountain Park falls under the authority of the Pima County Parks and Recreation Commission as Authorized under A.R.S.11-93

- Until properly posted, the Park shall be open to the public 24 hours per day. However, this does not allow access across State Lease Land without the appropriate permit. Please contact the State Land Department for information on access permits.
- All State and Federal laws shall apply at all times.
- Until properly fenced and posted, the park shall be subject to "open range status" which permits cattle to legally graze on the property.
- Hunting within Tortolita Mountain Park is subject to the hunting regulations as approved by the Arizona Game and Fish Commission under A.R.S. Title 17.

Arthur Pack Regional Park-- This park is a 505-acre urban park administered by the Pima County Parks and Recreation Department. Public Use Policies are subject to the approval of the Pima County Parks and Recreation Commission under Arizona Administrative Code Title 12, Chapter 12.

The general provisions for Arthur Pack Regional Park fall under the following sections:

- R12-12-01 Domestic Animals and pets in park and recreation areas.
- R12-12-02 Intoxicants and disturbing the peace in park and recreation areas.
- R12-12-04 Use and occupancy rules and regulations of public parks under the supervision and control of the Pima County Parks and Recreation Department.
- R12-12-05 Violations and penalties.

Arthur Pack Regional Golf Course is owned and administered by Pima County; however, the management and operation is under lease. The use and occupancy of the golf course is subject to the conditions of the lease as approved by the Pima County Parks and Recreation Commission and the Pima County Board of Supervisors.

For a full listing of all reserve policies within the Tortolita Fan Sub area, please refer to Tables 19 and 20 within this subarea report.

Table 19: Public Use Policies in the Tortolita Fan Subarea

Managing Entity	Reserve Name	Public Use Policies													Comments			
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archer Hunting	Off-Range Plinking	Shooting Range	Fishing		Swimming	Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	R	R	R	NA	R	R	R
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
U.S. Bureau of Land Management	Unreserved BLM	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
National Park Service	Saguaro National Park (excluding wilderness area)	Y	N	R	R	R	R	R	R	R	R	R	R	R	N	R	R	Y
Arizona State Parks Board	Catalina State Park	Y	Y	Y	Y	Y	R	R	R	R	R	R	R	R	NA	Y	Y	Fee Area, Backcountry permit required for camping in E. Unit
Pima County	Tortolita Mountain Park	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	NA	NA	Y	N	Fee Area Change Pending, Rec. Use permit to cross State Land
Pima County	Arthur Pack Regional Park	Y	R	N	R	N	N	R	R	N	N	N	N	N	NA	Y	N	
U.S. Forest Service	Santa Catalina Research Natural Area	Y	R	N	N	N	N	N	N	N	N	NA	NA	NA	NA			
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	NA	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes

R = Restrictions

P = Permit Required

N=No

NA=Not Applicable

Table 20: Resource Policies in the Tortolita Fan

Managing Entity	Reserve Name	Resource Management Policies														Comments						
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.	
Varies	Wilderness Areas	R	N	P	N	Y	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	
U.S. Forest Service	Unreserved Coronado National Forest	P	Y	Y	Y	P	P	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
U.S. Bureau of Land Management	Unreserved BLM	P	Y	Y	Y	P	P	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
National Park Service	Saguaro National Park (excluding wilderness area)	N	N	N	N	N	N	P	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	
Arizona State Parks Board	Catalina State Park	N	P	P	P	N	N	P	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	
Pima County	Tortolita Mountain Park	N	Y	P	P	Y	N	P	Y	N	N	N	N	N	Y	Y	Y	N	N	Y	Y	
Pima County	Arthur Pack Regional Park	N	P	P	P	N	N	P	Y	N	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	
U.S. Forest Service	Santa Catalina Research Natural Area	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	
State of Arizona	State Trust Land	P	Y	P	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Y=Yes

R = Restrictions

P = Permit Required

N=No

NA=Not Applicable

Existing Reserves

Arthur Pack Regional Park

Arthur Pack Regional Park is a 505-acre Pima County urban park located in Section 19 of T12S, R13E on the northwest side of the Tucson metro area in unincorporated Pima County. The park is bounded by Linda Vista Boulevard on the north, Thornydale Road on the east, the Camino de Oeste alignment on the West, and a section of Hardy Road on the south. The property was acquired from the U.S. Bureau of Land Management in the early 1970s through the R&PP (Recreation and Public Purpose) process.

The park covers the majority of Section 19, with the exception of the far northeast corner, which is occupied by the Mountain View High School complex, and the northwest corner, which is occupied by an undisturbed 60-acre tract of State Trust Land.

The park's facilities include an 18-hole public golf course with a pro shop and restaurant, football, baseball and soccer fields, a basketball court, reservable ramadas, a concessions building, and parking lots. A master plan for the park was produced in 1988 and amended in 1994.

Approximately 240 acres of the site are taken up by the golf course and other developed recreational facilities. The remainder of the site is natural desert open space, which is of remarkable diversity and high quality. A large quantity of ironwood trees and more than three dozen saguaro cactus can be found distributed throughout the site's undisturbed desert. Woodland areas occur along the park's major washes, particularly along the segment of the Hardy Wash that passes through the southernmost extent of the park. Dense thickets of natural growth occur along the park's smaller washes as well. The 1988 master planning process for the park noted that "The uniqueness and high quality of the on-site vegetation is sufficient to warrant the preservation of large areas of the park."

The superior quality of the park's natural vegetation provides excellent habitat for a variety of wildlife species. Mammals such as javelinas, kit foxes, gray foxes, coyotes, bobcats, and rabbits have frequented the property, as do an exceptional variety of birds. The endangered cactus ferruginous pygmy-owl has been identified on the site, and is attracted to the park's plentiful ironwoods and saguaros. Because the owl makes the park its home, the further development once planned for the park has been discontinued.

In contrast to the site's impressive natural resource characteristics, the park's cultural resources are scant. Planners developing the park's master plan in 1988 found that previous archeological surveys had identified no significant archeological sites in or around the park.

In addition to the protection of the park's remaining natural open space, county park planners and the environmental community have identified the 60-acre parcel of State Trust Land located at the northwest corner of the park for protection as well. The resource values on this

parcel, which contains segments of five significant washes, are similar to those on the Arthur Pack Park site. After the results of the next decennial census are posted, this parcel will be within range of the Arizona Preserve Initiative boundary, and an API application could be prepared and submitted to facilitate its preservation.

Additional Biologically Important Lands in the Tortolita Fan Subarea 5

Several other scattered parcels of Arizona State Trust Land located in the area between Arthur Pack Regional Park and the Tortolita Mountains have been identified for possible conservation. These properties contain outstanding natural resource values and are located within the "flyway" for the cactus ferruginous pygmy-owl. As such, they are considered essential to the recovery of the owl, and could be the subject of future Pima County Arizona Preserve Initiative applications. The parcels include:

- T11S, R13E - Trust Lands in Section 32
- T12S, R11E - Trust Lands in Sections 24 and 36
- T12S, R12E - Trust Lands in Sections 8, 16 and 17
- T12S, R13E - Trust Lands in Section 4, 5 and 19

Opportunities for Reserve Expansion

Catalina State Park Expansion

Background -- The 5,511-acre Catalina State Park is situated in the western foothills of the Catalina Mountains adjacent to the Town of Oro Valley between the Coronado National Forest and the Oracle Highway. The park was formally established on May 1, 1974 through the approval of House Bill 2280 by the Arizona Legislature, and is one of the Tucson Basin's most popular natural resource areas.

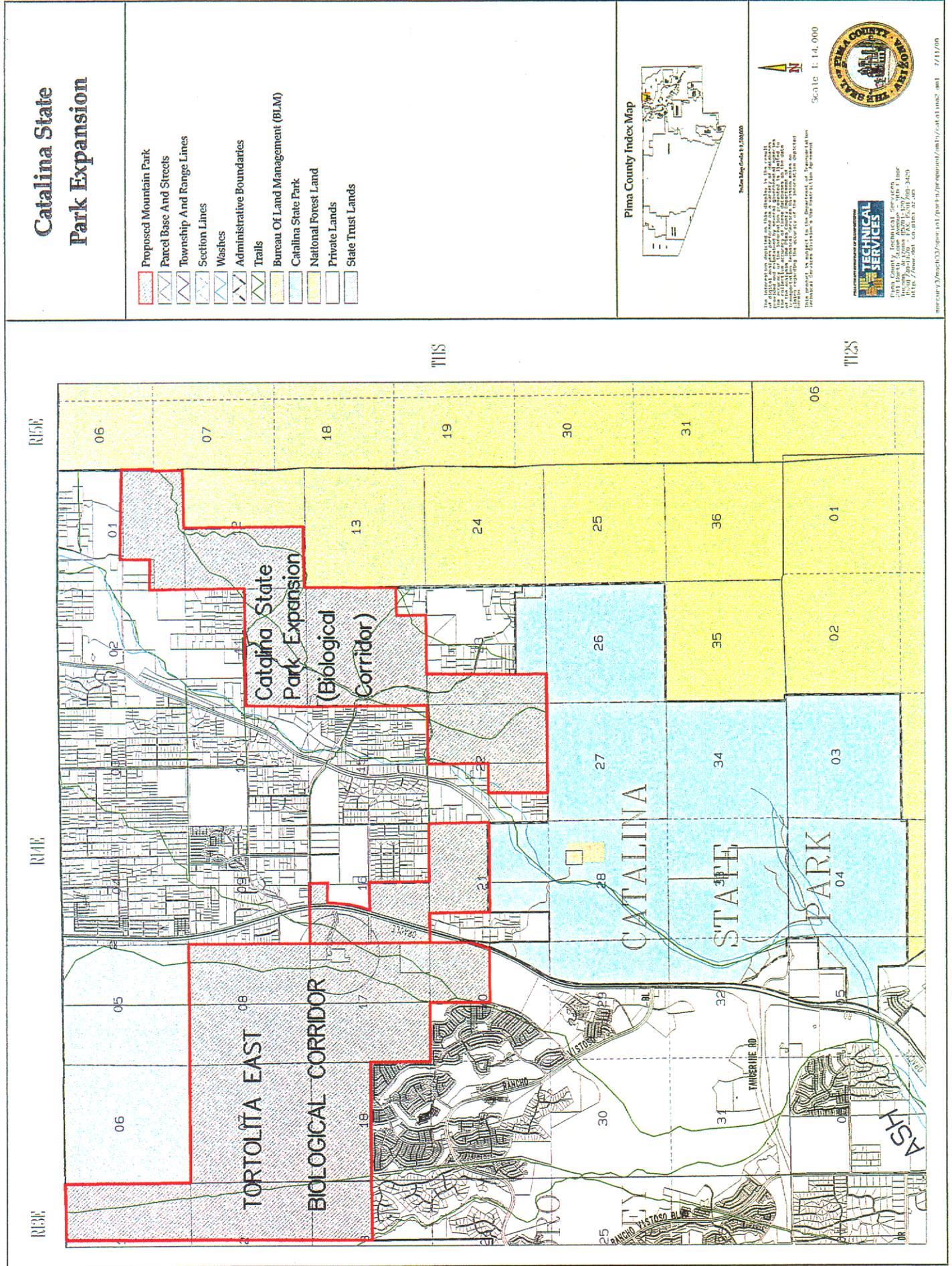
The park contains a wide variety of natural and cultural resources worthy of protection, including a large mesquite bosque and an important riparian ecosystem within the Canada del Oro Wash, which flows through the park. The lands encompassed by the boundaries of the park also insulate and protect the Pusch Ridge Wilderness, which is located immediately east of the park in the Santa Catalina Ranger District of the Coronado National Forest. Catalina State Park offers approximately 12 miles of recreational trail opportunities for hikers, equestrians and mountain bicyclists, and is a special favorite of horseback riders.

The Arizona State Parks Board owns a 19-acre parcel located at the entrance to the park along the Oracle Highway. The remaining lands within the park are owned by the U.S. Forest Service, and are a part of the Forest's Santa Catalina Ranger District. The property inside the park's boundaries is leased and managed as a state park unit by Arizona State Parks, under a long-term "Special Use Agreement" with the Forest Service. The current Special Use Agreement was executed in 1990, and will expire at the end of 2010. However, the expectation among all parties to the agreement is that the park is essentially a permanent fixture, and that the Special Use Agreement will be renewed at the appropriate time.

Due to its management by the State of Arizona, Catalina State Park is not a component of the Pima County Mountain Park and Natural Preserve System, but its key position and significance in the regional open space network led to its inclusion in both the 1997 Open Space Bond Program and the Sonoran Desert Conservation Plan. The 1997 Open Space Bond Program designated \$1 million of the program's \$27.9 million in open space acquisition funding to facilitate the northward expansion of the park. A total of 1,000 acres of State Trust Land located in sections 14 and 22 of T11S, R14E was identified for potential acquisition in the Truth in Bonding Ordinance (Pima County Ordinance 1997-35). The rationales for the acquisition of the property included helping protect the park's scenic values and wildlife habitat, facilitating the expansion the park's recreational trail system, and helping the area retain some of its rural character, which unfortunately is quickly eroding.

The Sonoran Desert Conservation Concept Plan took the expansion of Catalina State Park to the next level, and identified approximately 2,500 acres of property north of the park for possible protection (Figure 32). The central purpose of the proposed expansion is to facilitate the establishment of a biological corridor that would link the Coronado National Forest, the Sutherland Basin, and Catalina State Park to the Tortolita East Biological Corridor and the

Figure 32



Tortolita Mountains. The proposed biological corridor would allow the natural movement patterns of the wildlife in the area to continue, which would help protect the genetic health of these species by keeping them from being isolated in a fragmented habitat area.

The corridor would provide a long-sought and critical connection in Eastern Pima County's regional open space network, and provide a range of other valuable benefits, including the protection of scenic resources and riparian and upland wildlife habitat, the provision of additional trails-based recreational opportunities, and the protection of natural wash corridors, which would enhance local flood control and natural aquifer recharge. As noted, the majority of the property identified in the SDCP's Catalina State Park expansion area--more than 2,400 acres--is State Trust Land, and the V-shaped geographic arrangement of these Trust Lands is a near-ideal configuration for establishing the desired linkages. A 240 acre piece of private property located at the bottom of the 'v' compromises the layout of the corridor. It is anticipated that landowner cooperation for the pockets of private lands within the expansion area would make conservation purposes possible.

Because of the rapid pace of growth in the area and ever-increasing development pressure, Pima County moved to protect the undeveloped State Trust Lands in the expansion area north of the park through the preparation and submission of an Arizona Preserve Initiative application. The API application sought to have all of the Trust Lands north of the park--a total of 2,320 acres--reclassified for conservation purposes, which would protect it for up to 8 years while acquisition funding was being assembled. The preparation of the API application was approved by the Board of Supervisors on November 10, 1998, and was submitted to the State Land Department in April of 1999. The application was returned to Pima County in July of 1999 due to the fact that the town of Oro Valley, the jurisdiction upon which the API reclassification boundary for the area north of Catalina State Park is based, did not have a population of more than 10,000 at the time of the last decennial census as required in the API organic legislation. This reduced the reach of the API from three miles beyond the town boundary to one mile, despite the fact that Oro Valley is considerably larger than 10,000 and has been for many years, and rendered the expansion lands ineligible for reclassification. The three mile API boundary will not be applicable to the town of Oro Valley until the results of the decennial census, conducted in the year 2000, are posted. The State Land Department encouraged Pima County to resubmit the application at that time, which will probably be sometime in the year 2001. In the meantime, the lands will remain unprotected and available for sale to the development community.

The \$1 million in funding provided for the expansion of Catalina State Park (Project #SD-7) in the 1997 Open Space Bond Program will ultimately be used as the foundation for the acquisition of the Trust Lands in the suggested expansion area. Like the funds designated for the expansion of Tortolita Mountain Park, the Catalina State Park bond funds will be used to leverage matching grants from other sources to extend their purchasing power. Pima County plans to apply for a 50-50 matching grant from the state's recently-created "Growing Smarter" grant program, which will double the available funding from \$1 million to \$2 million. In 1998, Pima County Parks and Recreation Department planning staff approached Arizona State Parks

about the possibility of having the agency match the county's bond funds with monies it receives annually for land acquisition from the Arizona Heritage Fund. The proposal was received with interest, and staff is hopeful that an acquisition partnership will materialize. If State Parks matches Pima County on a 1-to-1 or 2-to-1 basis, and these funds are subsequently matched with a Growing Smarter grant, as much \$4 million to \$6 million could be generated to purchase the State Trust Lands.

Existing Conditions -- Like the adjacent Tortolita Mountains, the formerly rural lands surrounding Catalina State Park have been the subject of considerable growth over the past 15 years. The park is now virtually surrounded by urban development on three sides. Of the 15 total miles of park boundary, six abut the Coronado National Forest and its Pusch Ridge Wilderness. The remaining nine miles of boundary -- including one mile of the southern boundary, and the entirety of the western and northern boundaries -- are bordered by private properties and undeveloped Arizona State Trust Land, and are consequently exposed to the effects of urban encroachment.

In its 1991 Management Plan for Catalina State Park, Arizona State Parks predicted that "...within ten years, Catalina State Park will indeed be an urban park functioning within the context of metropolitan Tucson." Eight years later, this prediction is well on its way to proving out. State Parks planners also noted that urban encroachment around the park would undoubtedly have a variety of effects, "...dramatic increases in visitation and vehicular traffic, altered viewsheds, degradation of air quality, boundary [issues with] residential developments...and increased demands on park infrastructure, equipment and staff."

The 7,600 acre Rancho Vistoso master-planned community is located immediately west of Catalina State Park and is proposed to be expanded to the town of Oro Valley. The developer, Vistoso Partners, has recently acquired additional land and plans to expand the scope of the project. The growing village of Catalina, which has considered incorporation in the past, is located immediately north of the subject area. The Saddlebrooke development, a large retirement community, is located nearby in southern Pinal County, and additional large-scale development -- thought to be another retirement community -- may be slated for the proximity of Saddlebrooke as well. This profound and accelerating regional development pattern argues for fast action in order to preserve the State Trust Land proposed for the expansion of the park and the creation of its biological linkage to the Tortolita Mountains.

Park Concept -- According to the park's management plan, the purpose of Catalina State Park "...is to preserve vital natural resources and processes while providing recreational opportunities which promote interaction with the natural environment." Towards that end, State Parks has kept facility development to a minimum while providing recreational activities that are compatible with resource protection, such as hiking, birdwatching, horseback riding, mountain biking, camping, interpretive trail use, and environmental education and research activities. (Catalina State Park Management Plan.) The northern expansion of Catalina State Park proposed by the Sonoran Desert Conservation Concept Plan is compatible with the stated

mission of the park and its fundamental concept, including its recreation element, and would help protect, and hopefully enhance, the resources the park was created to preserve.

Natural Resources -- The natural resources contained within Catalina State Park's 5,000 acres are varied and unique. Its location at the base of the northwestern slopes of the Santa Catalina Mountains is one of the most breathtakingly scenic settings in Eastern Pima County, and the existence of the park helps to assure the protection of this dramatic viewshed, which has been significantly compromised just short distance to the south by the residential and commercial development on and along Pusch Ridge.

Sections of two major wash corridors--the Canada del Oro and the Sutherland washes--pass through the park, which protects the valuable riparian habitat within them. These washes and their tributaries support an extensive mesquite bosque. The Arizona Game and Fish Department has commented that "...the mesquite bosque vegetative community which occurs on the Canada del Oro, Sutherland Wash and associated tributaries is considered a critical wildlife habitat and a high-value riparian forest ecosystem" (Catalina State Park Management Plan). Other plant associations that occur within the park's riparian community include Arizona ash, cottonwood, sycamore, desert willow, oak, netleaf hackberry, Arizona walnut and Arizona cypress. Other major vegetation types found in the park include desert scrub, desert grassland, and foothill communities.

Many of these same qualities and characteristics are present on the park's northern expansion lands, which also encompass segments of the Canada del Oro and Sutherland washes. The gently-rolling hillsides and rocky ridges north of the park have outstanding scenic qualities, and all of the subject expansion Trust Lands contain excellent examples of natural Sonoran Desert habitat, including large and impressive stands of saguaro cactus.

The area's variety of vegetation types support a wide range of desert wildlife. Species typically found throughout Catalina State Park and on the park's proposed northern expansion lands include javelina, coyote, jackrabbit, cottontail, bobcat, skunk, squirrels, mule deer, and bats, as well as a multiplicity of snakes, lizards and birds. The park provides habitat for migratory neotropical birds and also wintering peregrine falcon. Desert bighorn sheep have been sighted in the park and on surrounding lands in the past, although their numbers have declined to a bare few in recent years, which is believed to be due to human encroachment into their habitat. The park's northern expansion lands contain habitat considered suitable for the endangered cactus ferruginous pygmy-owl. The Sonoran desert tortoise, a species of special concern, can be found within the habitat that exists in the area, and could conceivably be present on the expansion lands. Other special status wildlife that may exist on and around the subject expansion lands include the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, and the California leaf-tongued bat.

The State Trust Lands proposed for addition to Catalina State Park as a part of the Sonoran Desert Conservation Concept Plan are a part of the eastern viewshed of the Oracle Highway corridor, one of the most scenic drives in southern Arizona. This route is identified in the Pima

County Comprehensive Plan as one of the community's five principal "gateway" corridors, and derives a considerable portion of its beauty from these undisturbed Trust Lands at the foot of the Santa Catalina Mountains. The acquisition of the subject Trust Lands by Pima County and their addition to Catalina State Park will help protect this valuable scenic corridor and, as noted above, help preserve some of the area's dwindling rural character.

The subject park expansion lands are located within a geologically unusual "graben"--an area between two parallel faults filled with sedimentary deposits. According to local authorities, the graben makes this area a unique intermontane zone with noteworthy ecological characteristics. The park's expansion lands--particularly those nearest to the Sutherland Wash, experience unusual climatic conditions, and can receive up to twice the amount of rainfall received elsewhere in the Tucson basin.

Cultural Resources -- The lands presently within the boundaries of Catalina State Park are home to a wide range of valuable cultural resources. Investigations conducted by the Arizona State Museum and others have found tools, flakes and projectile points that are believed to date back to 5000 B.C. These investigations also suggest that the area was occupied by Hohokam Indians from about 300 B.C. to around 1500 A.D. Some 38 archeological sites have been located and recorded in the park, the most significant of which is the Romero Ruin or "Pueblo Viejo." The Romero Ruin is a classic Hohokam habitation site and historic ranch compound that covers approximately 30 acres, and features a stone compound wall, several rooms of stone masonry construction, rock and trash mounds, rock alignments that are believed to have been irrigation troughs, and two depressions that may have been used as ball courts.

Of the variety of cultural resource studies that have been conducted in the park to date, the most comprehensive was the 1987 study "Archeological Survey in Catalina State Park With A Focus on the Romero Ruin" by the Institute for American Research. The findings of the study led to the creation of the Sutherland Wash Archeological National Register District in 1988. The State Trust Lands north of the Catalina State Park identified for addition to the park through the planning process for the Sonoran Desert Conservation Concept Plan (and included in the Pima County's Catalina State Park API application) have not yet been systematically surveyed, but evidence of the occupation of these lands by Hohokam Indians can be found throughout the area. Additional sites are expected to be found along the Sutherland Wash and the nearby Canada del Oro Wash.

Recreation Potential -- Catalina State Park is a leading destination for recreational trail users, and as previously noted, offers approximately 12 miles of recreational trail opportunities for hikers, equestrians and mountain bicyclists. The park is a particular favorite of horseback riders because of suitability of its trails for equestrian use, and the park's extensive equestrian center, which features expansive horse rig parking, corrals, water and other amenities. The 8-mile long 50-Year Trail begins in the park, as do the Sutherland and Romero Canyon Trails, which provide hiking and equestrian access into the adjacent Pusch Ridge Wilderness Area. Catalina State Park is considered the "Gateway to the Pusch Ridge Wilderness." The park is also a



Gale Bundrick

Catalina State Park provides access to the Pusch Wilderness Area

highly-regarded birdwatching site. Catalina State Park presently serves as the principal natural open space park for the rapidly growing northwest region of the Tucson Basin, including parts of the City of Tucson, the Town of Oro Valley, and the unincorporated village of Catalina. Each of these communities is home to large numbers of outdoor enthusiasts--including hikers, equestrians, mountain bicyclists and birdwatchers.

The park's potential expansion area includes segments of eight trails listed on the Eastern Pima County Trail System Master Plan, including the 50-Year Trail (Trail #29), which crosses the expansion area via a Special Land Use Permit from the State Land Department, the Canada del Oro Wash (Trail #2), and the Sutherland Wash (Trail #35). The property is presently being used by hikers, equestrians and mountain bicyclists. Low-intensity recreational trail use of the type that is presently occurring use should complement the expansion area's principal purpose, which is to function as a biological corridor. The suggested expansion area property also offers excellent opportunities for environmental education and scientific research.

Linkages to Other Protected Natural Areas -- The preservation of a corridor of open land between the Tortolita Mountains and the Catalina Mountains capable of serving as a viable biological corridor has been a concern for many in the community for many years. This concern has increased in the 1990s, as the pattern of growth in the northwest region of the Tucson metro area hit a fever pitch.

The expansion of Catalina State Park as proposed in the Sonoran Desert Conservation Concept Plan will ultimately make this linkage possible, and assist the effort to preserve the integrity of the open lands in the northwest area and their resident wildfire populations.

Implementation -- The effort to implement the expansion of Catalina State Park and establish the much-anticipated biological linkage between the park, the forest and the Tortolita Mountains began on November 10, 1998, when the Pima County Board of Supervisors approved the preparation and submission of an Arizona Preserve Initiative application encompassing the 2,320 acres of State Trust Lands north of the park.

The API application sought the reclassification of these lands for conservation purposes, and if it had been accepted, would have allowed them to remain in their natural state for up to 8 years while funding was amassed by Pima County to acquire the property.

While the application, which was submitted in April of 1999, was ultimately not accepted for technical reasons, the Arizona State Land Department encouraged Pima County to pursue the reclassification of the property after the results of the next decennial (2000) census have become available.

Pima County staff will resubmit the application at the earliest opportunity. In the meantime, staff will ensure that Arizona State Land Department officials are aware of the community's commitment to the protection of these lands, and monitor the property to make sure it remains in excellent natural condition.

Tortolita Mountain Park Expansion

Tortolita Mountain Park was established in 1986, and is currently 3,001 acres in size. The Park is located northwest of the Tucson metropolitan area. The towns of Marana, Tortolita, and Oro Valley abut its southern edge, while Catalina is three miles to the east. The Tortolita Mountains are one of the oldest geological features in the Tucson area. The mountains contain a wide range of plant and wildlife species, including mountain lion, gray fox, mule deer, and a small herd of feral horses. The broad alluvial fan and plain located on the southwestern edge of the range is home to a large ancient forest of ironwood trees, prime habitat for the endangered cactus ferruginous pygmy owl.

Of the property located within the master plan's expansion area for the park, 57% is State Trust Land administered by the Arizona State Land Department, 21% is privately-owned property, 16% is presently owned by Pima County, and 6% is controlled by the U.S. Bureau of Land Management. The master planning process also included a survey of the park's natural and cultural resources, the identification of land conservation strategies, and the production of a development concept for the park. The Tortolita Mountain Park Master Plan was presented to the Pima County Board of Supervisors on April 15, 1997, and was adopted unanimously.

Tortolita Mountain Park will eventually serve as the principal natural open space park for the rapidly growing northwest region of the Tucson Basin, including the City of Tucson, the towns of Oro Valley, Casas Adobes, Tortolita and Marana, and the village of Catalina. Saddlebrooke, a large retirement community in southern Pinal County, will also be served by the park, as will residents in nearby segments of unincorporated Pima County. Each of these communities is home to considerable numbers of outdoor enthusiasts--including hikers, equestrians, mountain bicyclists and birdwatchers--all of whom will be able to use the park for recreation purposes.

In 1996, while the planning process for Tortolita Mountain Park was underway, the State proposed the creation of the Arizona Preserve Initiative. The purpose of this program was to allow select high-resource value State Trust Lands located in the vicinity of existing municipalities to be reclassified for conservation purposes, and also provided a rudimentary mechanism through which conservation-reclassified State Trust Lands could be leased or ultimately acquired. The Arizona Preserve Initiative (API) process was recognized by Pima County as a valuable tool in the effort to expand Tortolita Mountain Park in accordance with the park's master plan, and the development of an API reclassification application encompassing the State Trust Lands located within the park's first and second-priority expansion zones was initiated in 1997.

On May 20, 1997, an 8-question special bond election was held in Pima County, and county voters approved a \$36.3 million Open Space and Historic Preservation Bond Program that provided a total of \$27.9 million for open space acquisition. Of the \$27.9 million, \$7,000,000 was earmarked for the Tortolita Mountains area; \$3 million for Tortolita Mountain Park, \$3 million for the adjacent Tortolita Ironwoods/Alluvial Fan area, and \$1 million for the segment of Honeybee Canyon within the planning boundary of Tortolita Mountain Park. Open Space

Bond Program funds were used to acquire an 80-acre parcel in Section 17 of T11S, R13E for park access purposes in 1998, and the 200-acre Carpenter Ranch in Section 35 of T10S, R12E in May of 1999. The acquisition of a large quantity of State Trust Land will be the focus of future bond-funded land purchases. As noted, Pima County presently owns a total of 3,001 acres within the Board-adopted planning boundary of the park.

The potential footprint of the planned Tortolita Mountain Park began to change considerably in mid-1998 as a result of community discussions regarding the protection of critical habitat for the cactus ferruginous pygmy-owl and the planning process undertaken for the Sonoran Desert Conservation Plan. Additional valuable natural resource lands were identified around the park, and two important and sizable additions were proposed for the park's expansion boundary: the Tortolita East Biological Corridor, and the Tortolita Ironwoods/Alluvial Fan area. The Tortolita Mountain Park Master Plan identified an expansion boundary encompassing a total of 21,030 acres.

The Tortolita East Biological Corridor is a 3,441-acre addition consisting almost entirely of State Trust Land that would adjoin the eastern expansion boundary of the park and link it with the proposed northern expansion area of Catalina State Park. The purpose of the Tortolita East Biological Corridor is to allow the creation of a perpetually-protected connection between the Catalina and Tortolita Mountains that would facilitate natural wildlife movement, and also protect segments of two significant wash corridors--Big Wash and Twenty-Seven Wash.

The Tortolita Alluvial Fan/Ironwood Forest addition is a 14,000-acre area of natural open space located west and south of the park and is bounded by the Central Arizona Project canal on the west, the Pima/Pinal county line on the north, and the Tangerine Road corridor to the south (two sections of land extend south of the Tangerine Road). Like the Tortolita East Biological Corridor, the Tortolita Alluvial Fan/Ironwood Forest addition is composed almost entirely of the State Trust Land. The property encompasses an extensive alluvial fan and plain that is in excellent natural condition, as well as an extensive ancient forest of ironwood trees which contain valuable habitat for the pygmy-owl. The importance of these lands as potential pygmy-owl habitat was confirmed in December, 1998, when the U.S. Fish and Wildlife Service included a large portion of this area in the owl's proposed critical habitat designation. The purposes of this extensive addition to Tortolita Mountain Park are severalfold, and include the preservation of the rare Ironwood forest and its owl habitat; the protection the alluvial fan and its natural drainage pattern; the large quantity of cultural resources that exist in the area; the outstanding unspoiled western viewshed of the Tortolita Mountains that extends from the Pima-Pinal county line to the Dove Mountain development, and the area's strong recreation potential.

With the incorporation of these two proposed additions, the expansion boundary of Tortolita Mountain Park will encompass a total of 37,782 acres: 27,827 acres of State Trust Land, 2,204 acres of BLM land, 4,305 acres of private property, and 3,445.75 acres of existing county parklands. The extent of both of these additions to the current Board-adopted planning

boundary of Tortolita Mountain Park is depicted on the Tortolita Mountain Park map on following page (Figure 34).

In response to the approval of the Sonoran Desert Conservation Plan concept document by the Pima County Board of Supervisors in October of 1998, county staff revised the draft Tortolita Mountain Park Arizona Preserve Initiative application to include the Tortolita East Biological Corridor, and began work on a new application for the Tortolita Alluvial Fan/Ironwood Forest lands.

The addition of the 3,441 acres of Trust Land in the new Tortolita East Biological Corridor to the 6,118-acres of Trust Lands within the park's First and Second Priority expansion areas brought the total amount of Trust Lands requested for reclassification in the original Tortolita Mountain Park API application to 9,559 acres (it should be noted that approximately 1,600 acres of the Trust Lands in the Tortolita Mountain Park portion of this API application are located within Pinal County, and the concurrence of the Pinal County Board of Supervisors is required before these Trust Lands can be reclassified by the Arizona State Land Department).

In addition to the original Tortolita Mountain Park API, a new API application was prepared for the west side of the park for that included approximately 2,200 acres of State Trust Lands within the park's existing Planning Boundary that were identified in the 1997 Open Space Bond Program (Project #SD-6), as well as the 14,000 acres of Trust Lands in the Alluvial Fan/Ironwood Forest expansion areas identified in the Sonoran Desert Conservation Concept Plan, for a total of 16,185 acres. Submission of these and three other API applications were approved by the Pima County Board of Supervisors on November 10, 1998. Both Tortolita API applications were submitted in 1999.

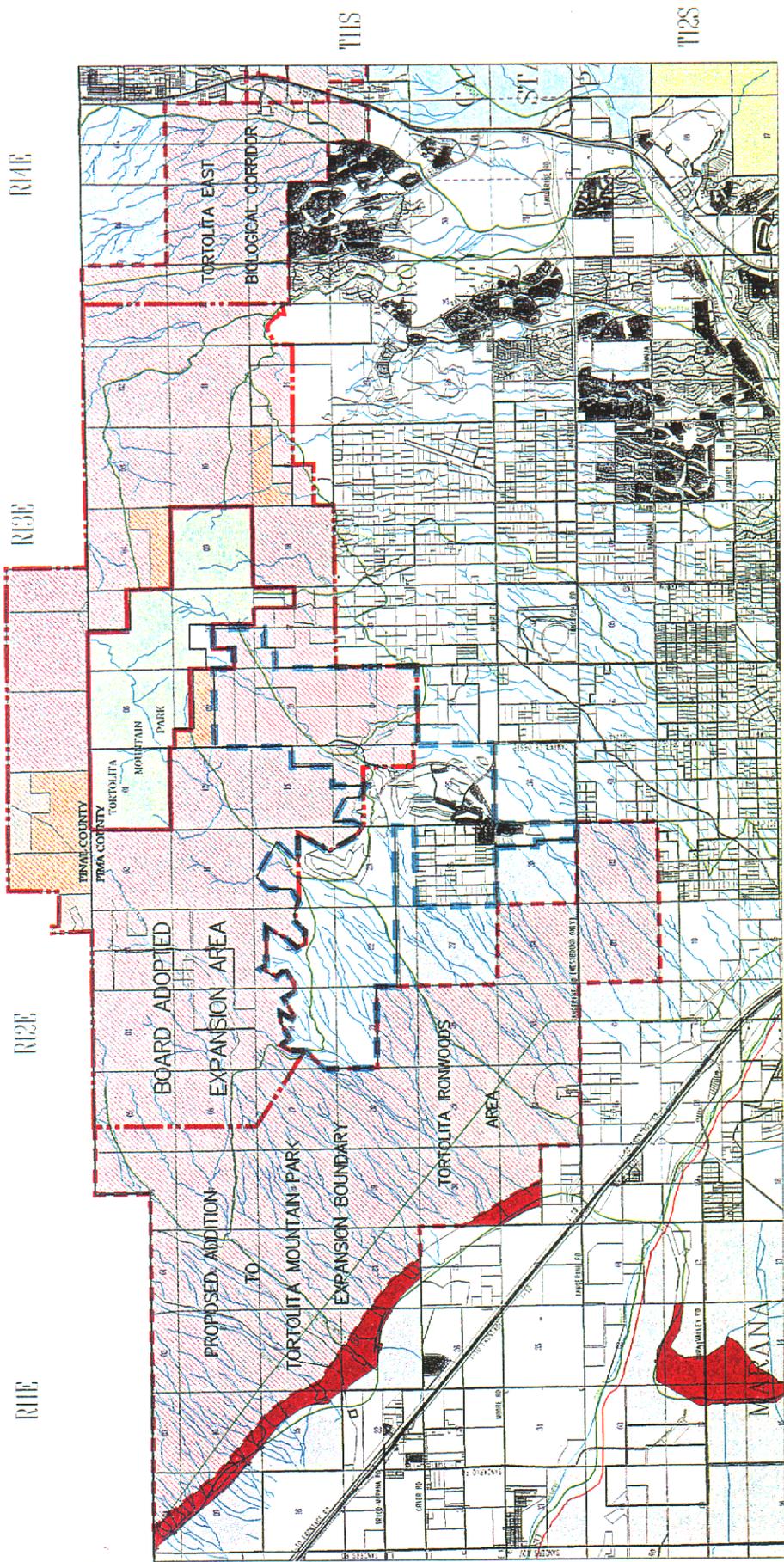
Park Concept -- While the Sonoran Desert Conservation Planning process may lead to decisions which alter land management practices, Tortolita Mountain Park has been managed as a primitive county mountain park on the order of Tucson Mountain Park, only with a smaller amount of formal development. Tortolita Mountain Park has an advantage over Tucson Mountain Park in that it will probably not be bisected by roads, and motorized vehicles (other than park maintenance vehicles) will not have access to the interior of the park. The park's developed features will likely be located on the periphery of the Tortolita mountain range, and the interior of the park limited to recreational trails, unobtrusive directional and interpretive signage, and an occasional primitive rest/picnic area.

Five sites around the perimeter of the park were identified in the Tortolita Mountain Park Master Plan for facility development. These sites include:

- Crow Wash Trailhead, Day Use Area and Campground
- Oro Valley Trailhead
- Vulture Peak Trailhead
- Wild Burro Wash Trailhead and Day Use Area
- Cochie Canyon Trailhead, Day Use Area and Campground

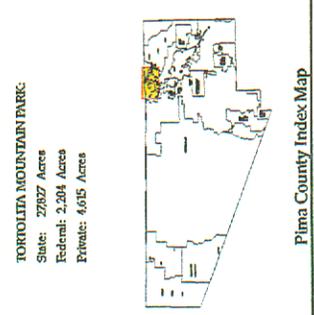
Figure 34

Tortolita Mountain Park



TORTOLITA MOUNTAIN PARK
 State: 27837 Acres
 Federal: 2,204 Acres
 Private: 4,615 Acres

Scale: 1:27,000



- | | | | |
|--|---------------------------------|--|-----------------------|
| | Proposed Park Boundaries | | National Forest Land |
| | Present Master Plan Boundary | | Private Lands |
| | Proposed Mountain Parks | | State Trust Lands |
| | Bureau Of Land Management (BLM) | | Bureau Of Reclamation |
| | Bureau Of Reclamation | | Catalina State Park |
| | Catalina State Park | | Existing Pima County |
| | Existing Pima County | | |

- | | |
|--|---------------------------|
| | Done Mountain Property |
| | Parcel Base And Streets |
| | Township And Range Lines |
| | Section Lines |
| | Washes |
| | Trails |
| | Administrative Boundaries |
| | Existing Park Boundaries |

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The Oro Valley and Vulture Peak Trailheads would entail the development of small trailhead parking facilities only, which typically offer parking spaces for cars and horse rigs, interpretive signage, and a 911 emergency telephone. The Crow Wash and Cochie Canyon facilities, located on the eastern and western ends of the park, could serve as the park's "gateway" access points and are likely to include trailhead parking areas, restrooms, a visitor contact station, picnic areas, a campground, a water source, and a park maintenance facility.

The fifth site could be located near the near Wild Burro Canyon adjacent to the Dove Mountain development, and would offer a trailhead parking area, restrooms, a picnic area, a visitor contact station, a small park maintenance facility, an interpretive loop trail, and possibly an interpretive center for the park. Additional developed sites may be added if the park is expanded as suggested by the Sonoran Desert Conservation Concept Plan.

Tortolita Mountain Park could also feature an internal recreational trail system intended to serve hikers, equestrians, and bicyclists. While a concept trail system was conceived as a part of the park's master planning process, the ultimate configuration of the trail system, and decisions about which trails would be open to which users, will be made as the system is formally planned and implemented.

The two large additions to the park identified in the Sonoran Desert Conservation Concept Plan -- the Tortolita East Biological Corridor and the Tortolita Alluvial Fan/Ironwood Forest area -- could be maintained in natural condition in order to preserve their efficacy as wildlife habitat and movement corridors. These areas may accommodate segments of the park's trail system, but are unlikely to include any other developed features.

Natural Resources -- The Tortolita Mountains are notable for the diversity and outstanding quality of the natural resources that exist there. The range's plant, wildlife and scenic resources are exceptional and worthy of protection. Particularly notable is the diversity of vegetative communities that occur over what is considered to be a relatively small geographical area. Vegetative communities located within the present boundary of the park include Sonoran Desertscrub, Paloverde-Cacti-Mixed Scrub Series; Interior Chaparral, Scrub Oak Series, Sonoran Riparian Deciduous Forest and Woodland, Mesquite Series; Sonoran Riparian Deciduous Forest and Woodland, Cottonwood-Willow Series, and Sonoran Riparian Scrubland, Mixed Scrub Series. The majority of the park is considered to be within the Sonoran Desertscrub biotic community.

Also notable is the composition of the plant community found on the Tortolita Alluvial Fan and plain, which has been proposed for addition to the park in the Sonoran Desert Conservation Plan. The alluvial fan area is home to a large and impressive ironwood forest, and some of the trees within the forest are believed to be hundreds of years old. The density and superlative quality of the ironwood forest make it prime potential habitat for the cactus ferruginous pygmy-owl, and led to its inclusion in the U.S. Fish and Wildlife Service's critical habitat designation for the owl. While Pima County Park staff knows of no special status plant species identified within the current boundaries of the park, the lands do contain large,



John Dell

Tortolita Mountain Park

undisturbed, healthy stands of saguaro, barrel, ocotillo and cholla cactus, mesquite, palo verde and--as noted--ironwood trees, as well as a wide variety of native grasses, bushes and other plants.

The Tortolita Mountains area supports a wide range of wildlife, and is capable of supporting certain special status wildlife species. As noted, the park's expansion lands contain habitat considered suitable for the pygmy-owl. The Sonoran desert tortoise, a species of special concern, is commonly found within the kind of Paloverde-Cacti Mixed Scrub Series habitat found in and around the park, and may be present there.

Other special status wildlife found on and around the subject lands include the American peregrine falcon, the Lesser long-nosed bat, the Mexican long-tongued bat, and the California leaf-tongued bat. A wildlife survey conducted as a part of the master planning process for the park in 1996 identified a wide range of animal and bird species, including mountain lion, peccary, mule deer, and large numbers of birds and lizards. The Tortolita Mountains are also home to a small herd of wild horses--one of the few such herds remaining in southern Arizona.

A review of the Tortolita's natural resources would not be complete without mention of its outstanding scenic values. The Tucson Basin is surrounded by breathtaking mountain ranges, but the Tortolita's landforms offer a special, unique blend of large quantities of rock in unusual formations, as evidenced by the prominent peaks and ridges that comprise the major canyons of the range.

The 4,651 foot tall Tortolitas Peak is a community landmark, and its craggy slopes are visible from a substantial portion of the Tucson Basin. The riparian corridors in and around the Tortolitas--Honey Bee Canyon, Sausalito Creek, Big Wash, Twenty-Seven Wash, and Wild Burro Wash--possess exceptional scenic values, as do the range's saguaro cactus, which are some of the largest and most impressive in southern Arizona. Crestate saguaros seem in particular abundance.

These outstanding scenic resources combine to form several of the last undiminished mountain viewsheds in the eastern Pima County area. From the Pima-Pinal county line to the Dove Mountain development, the Tortolita Mountains and its adjacent alluvial fan and plain remain unimpacted, and provide a breathtaking backdrop for the Interstate 10 corridor, which was designated as one of Tucson's five major "scenic gateways" in the Pima County Comprehensive Plan.

The eastern side of the range also remains unaltered north of Rancho Vistoso, and provides an excellent viewshed for the Oracle Highway corridor, another of Tucson's five scenic gateways. The Sonoran Desert Conservation Plan will pay a critical role in the protection of these irreplaceable scenic resources for generations to come.

Cultural Resources -- The Tortolita Mountains area is rich in cultural resources. Evidence of occupation by Hohokam Indians can be found throughout the area. On the eastern side of the park, the most significant resource is the large and well-known "Indian Town" site, which is in the park's first priority acquisition area. However, this area has not yet been systematically surveyed, and additional sites are expected to exist -- particularly along Honeybee Canyon and Sausalito Creek within the adopted park expansion boundary, and along Big Wash in the proposed Tortolita East Biological Corridor.

The Pima County Parks and Recreation Department plans to conduct a comprehensive cultural resources survey, as required by the Arizona State Land Department and to ensure appropriate protections for these resources in future planning and management decisions.

Cultural resources also abound on the western side of the range. Literally dozens of significant sites have been found in the vicinity associated with the adjacent Marana Platform Mound Community, one of the most significant archeological sites in the northwest quadrant of the Tucson Basin.

A comprehensive study of the area conducted in 1993 entitled The Northern Tucson Basin Survey documented the sites. The study, which was conducted by Dr. Paul Fish, Dr. Suzanne K. Fish, and John H. Madsen, contains considerable additional detailed information on the area's cultural resources and is available for review at the University of Arizona, as well as the office of Pima County Cultural Resources.

According to local archeologists, many questions about the native culture of this important area have yet to be answered, and securing this knowledge will require that the area be kept intact and protected through in-place preservation.

Settlement of the Tortolita Mountains began roughly at the turn of the century, with a small number of homesteaders that raised sheep, goats and cattle. Remnants of these early ranches and homesteads dot the Tortolita Mountains, and include the historic Carpenter Ranch cabin built at Cochie Spring in 1935, and holding pens with walls constructed of rock near the top of Wild Burro Canyon.

The Sonoran Desert Conservation Plan places a high degree of importance on the preservation of Pima County's cultural heritage, and every effort will be made to ensure that the valuable archeological and historic resources contained within the boundaries of Tortolita Mountain Park and its proposed large-scale expansion area are protected to the maximum extent feasible.

Recreation Potential -- Pima County's existing Tortolita Mountain Park holdings presently experience little visitation because legal public access to the park has not yet been secured. The park is surrounded by large quantities of State Trust Land and private property, and getting to the park requires the crossing of Trust-owned or private land. Entering either type of land without permission constitutes trespassing.

Permission to legally cross or recreate on State Trust Lands can be secured by obtaining a recreation permit from the Arizona State Land Department, although few people do so because the existence of the permit program is not widely known. The \$15 State Lands recreation permits are good for one year, and anyone possessing a permit can access Tortolita Mountain Park legally. Legal access issues could be resolved permanently if Pima County acquires the Trust Lands included in its Arizona Preserve Initiative conservation reclassification applications, and once public road access to the recently-acquired 80-acre Leef parcel has been perfected.

Despite the lack of broadly available public access, the Tortolita Mountains area is presently used for recreational purposes by small numbers of hikers, equestrians, mountain bicyclists, birders, geology and archeology buffs, and off-highway vehicle (OHV) enthusiasts (the OHV users generally confine their activities to the Trust Lands east and north of the park). The range is very well suited for recreational trail use, and a network of dirt roads and informal trails presently exists both within in the range and on surrounding lands. Several regional trails listed on the Eastern Pima County Trails System Master Plan connect with and provide access from metro Tucson to the park. These trails include:

- Trail #32 - Cottonwood Wash
- Trail #33 - Honey Bee Canyon
- Trail #34 - Sausalito Wash
- Trail #36 - Wild Burro Canyon
- Trail #37 - Chalk Mine Road/Edwin Road
- Trail #156 - Big Wash
- Trail #167 - Tortolita Foothills Trail
- Trail #168 - Twenty-Seven Wash
- Trail #176 - Tortolita Road
- Trail #179 - Tortolita Power Transmission Line
- Trail #180 - WAPA power line

An important regional trail, CAP Trail (Trail #3), connects with the Wild Burro Wash Trail near Tangerine Road, and when complete will provide an important alternate modes linkage between Tucson Mountain Park and Tortolita Mountain Park, as well as a remote trailhead staging area for Tortolita Mountain Park. The development concept for the park approved in 1997 as a part of the Tortolita Mountain Park Master Plan also calls for the development of an enhanced trail system within the expansion boundary of the park that will serve hikers, equestrians and mountain bicyclists. In addition, five trailhead staging areas will be dispersed around the boundary of the park. Information about these trailhead sites was provided in the Park Concept section on page 27. The 1997 Open Space Bond Program included \$150,000 to facilitate the development of the first phase of the park's trail system, but funding for trailhead development will need to be secured from another source at some future date.

The recreation pattern for the areas added to the park as a part of the Sonoran Desert Conservation Plan -- the Tortolita East Biological Corridor and the Tortolita Alluvial Fan/Ironwood Forest -- will correspond with the plan's intention that these areas serve primarily

as biological corridors and habitat areas. Consistent with this intention, recreation in these areas is likely to be confined to a small number of carefully-planned and executed recreational trails open to non-motorized shared-use. Three trails listed on the Eastern Pima County Trail System Master Plan pass through the Tortolita East Biological Corridor: the WAPA Power Line Trail (Trail #180), the Big Wash Trail (Trail #156), and the Twenty-Seven Wash Trail (Trail #168). Several Master Plan-listed trails also cross the Alluvial Fan/Ironwood Forest property, and include the Tortolita Foothills Trail (Trail #167), the Cottonwood Wash Trail (Trail #32), the Wild Burro Wash Trail (Trail #36), and the Tortolita Power Line Trail (Trail #179). The CAP Trail (Trail #3) is located along the western edge of the proposed alluvial fan addition.

Linkages to Other Protected Natural Areas -- The Sonoran Desert Conservation Concept Plan places a major emphasis on the establishment of biological corridors that will link the open space preserves that ring the Tucson Basin, and considerable attention has been paid to how the Tortolita Mountains and Tortolita Mountain Park can be connected to other protected natural areas. On the eastern side of the range, County staff has delineated the Tortolita East Biological Corridor, a 3,441-acre swath of open land intended to link Tortolita Mountain Park with Catalina State Park's northern expansion area and the Santa Catalina Ranger District of the Coronado National Forest.

The Tortolita East Biological Corridor is located north of the 7,600-acre Rancho Vistoso development in the town of Oro Valley, and is composed almost entirely of State Trust Land. Trust Lands within the Tortolita East Biological Corridor were added to the Arizona Preserve Initiative application that was prepared to secure the conservation reclassification of the first and second priority expansion areas of Tortolita Mountain Park. The goal of this action is to assure the protection of these lands at the same time the lands within the park's planning boundary are earmarked for conservation. While the Tortolita East Biological Corridor could be more effective if it also included Sections 5 and 6 of T11S, R14E, the corridor will undoubtedly serve as an invaluable link in the regional open space network.

The western side of the Tortolita Mountains are more problematic. Connecting the western end of the range to the Santa Cruz River corridor and the Tucson Mountains is a highly-desired goal, but three major impediments stand in the way: the Central Arizona Project canal, Interstate 10, and the growing town of Marana. In some places, less than two miles separate the undeveloped State Trust Lands west of I-10 with the Trust Lands east of the Interstate within the Tortolita Alluvial Fan/Ironwood Forest addition to Tortolita Mountain Park.

Achieving a connection between the Tortolita and Tucson mountains is a theoretical possibility, but would entail the conservation of a significant quantity of private as well as State Trust Lands, and would surely prove to be one of Pima County's greatest conservation challenges.

While the possibility of linking the Tortolitas to natural open space south of the range has been rendered a virtual impossibility by urban development, the large quantity of undeveloped, open State Trust Land and U.S. Bureau of Land Management land in southern Pinal county mean that links between the Tortolitas and ranges such as the Suizo Mountains, Durham Hills,

Picacho Mountains, and Tortilla Mountains and the wide range of wash corridors interspersed between these mountains is still possible.

Implementation -- Implementation of Tortolita Mountain Park first began in 1986, when the Pima County Board of Supervisors approved the use of 1986 bond funds to acquire the park's first acreage. Between 1986 and 1989, a total of \$8,258,000 in bond funding was used to acquire a total of 3,055.75 acres.

In 1986-87, 2,426.75 acres were purchased from Don and Glenda Martin, who had previously ranched the property and continue to maintain a ranch on the eastern side of the range.

In 1988-89, 629 acres were purchased from Oda and Pearl Pace and William Poteet. No additional property for the park was acquired until 1996, when a 110-acre parcel owned by David Dybvig was purchased in Section 34 of T10S, R12E. The Dybvig property is located within the park's expansion boundary in southern Pinal County, and was the first parcel of land acquired for the park outside of Pima County.

In 1996, Pima County retained the landscape architecture and planning firm McGann and Associates to assist the county with the preparation of a master plan for Tortolita Mountain Park. The plan took 14 months to produce, and was adopted by the Pima County Board of Supervisors on April 15, 1997 (Resolution #1997-73).

The plan was also adopted by the Town of Oro Valley on November 18, 1999 (R98-50). The park's master plan established a formal expansion boundary, and prioritized the lands to be acquired. The master plan also identified acquisition strategies and potential funding sources for the park's expansion lands.

The 1997 Open Space Bond Program, which was approved by the voters by a margin of almost 70-30, provided \$27.9 million in funding for open space acquisitions in Pima County. Of the \$27.9 million, \$7 million in funding was made available for the Tortolita Mountain Park area: \$3 million for the Tortolita Mountains, \$3 million for the Tortolita Ironwood Forest/Alluvial Fan area, and \$1 million for the segment of Honeybee Canyon located within the park's planning boundary. In March, 1998, an 80 acre parcel located in Section 17 of T11S, R13E was acquired from the Leef family to assure access into the park from its southern boundary. The Leef property, acquired using \$280,000 in 1997 Open Space Bond funds, will facilitate the implementation of the park's Vulture Peak Trailhead.

In May of 1999, the 200-acre Carpenter Ranch was purchased for \$400,000. Like the Dybvig property, the Carpenter Ranch is located in the northern extreme of the park's expansion boundary in southern Pinal county, and is the second property outside Pima County acquired for addition to the park in accordance with the Board-approved master plan.

Also in the late Spring of 1999, Pima County submitted two Arizona Preserve Initiative applications to the State Land Department requesting that a total of 25,744 acres of property in the Tortolita Mountains area be reclassified to conservation status.

Pima County staff is presently finalizing a Cooperative Management Agreement (CMA) with the U.S. Bureau of Land Management that will allow the 1,400 acres of property controlled by the BLM within Tortolita Mountain Park's expansion boundary to be managed by Pima County as a part of the park.

The BLM property was designated in the 1988 Phoenix District Resource Management Plan (RMP) as a Cooperative Recreation Management Area (CRMA), and will remain under federal ownership until such time as the Resource Management Plan is amended to make the property available to purchase by Pima County under the Recreation and Public Purposes Act. The 1988 Phoenix District RMP also states that the BLM would "work to acquire" an additional 2,790 acres of State Trust Land in the Tortolitas for public recreation purposes, and Pima County could pursue this opportunity with BLM staff.

Finally, Pima County might consider engaging Pinal County in a joint venture to identify a planning boundary for the large segment of the Tortolita mountains in southern Pinal County. The goal would be to have Pinal County join with Pima County as a partner in the protection of these valuable natural resource lands, which includes habitat suitable for the cactus ferruginous pygmy-owl, and have a concept planning boundary for the park formally adopted by Pinal County. The southern Pinal segment of the Tortolitas includes land owned by the BLM and the State Land Department, as well as a considerable number of private landowners. Protecting the BLM property and bringing it into the park would be a simple and inexpensive matter; the biggest challenge would be protecting the significant quantity of private holdings that exist in the area. Pinal County has been receptive to partnership opportunities in the past, and is presently working with Pima County and the National Park Service's Rivers, Trails and Conservation Assistance Program to develop the Pima-Pinal Regional Trails Plan.

Applicable Planning Documents

The following planning documents contain information pertaining to Tortolita Mountain Park, the Tortolita Mountains, and/or the area surrounding the park:

- Pima-Pinal Regional Trails Plan (est. completion: 2000)
- Marana Park System, Open Space and Trails Master Plan (due fall, 1999)
- Town of Oro Valley Parks, Open Space and Trails Master Plan (1999)
- Tortolita Mountain Park Master Plan (1997)
- Marana General Plan (1997)
- Eastern Pima County Trail System Master Plan (1996)
- Focus 2020 - Town of Oro Valley General Plan (1996)
- RedHawk (Dove Mountain) Specific Plan (1996)
- Town of Oro Valley Honeybee Canyon Management Plan (1995)
- Pima County Comprehensive Plan (1992)
- Catalina State Park Management Plan (1991)
- The Findings of the Pima County Open Space Committee - A Report to the Pima County Board of Supervisors (1988)
- Rancho Vistoso Planned Area Development

Mountain Parks, Reserves and Biologically Significant Resource Lands

ALTAR VALLEY SUBAREA

Sonoran Desert Conservation Plan

August 2000

Introduction

The Altar Valley is one of the largest subareas (see Figure 36), extending north from the Mexican border to the center of Tucson Mountain Park. To the east lie the Cerro Colorado Mountains, named for its rocky red volcanic form. The Sierrita Mountains and smaller mountain range are also found to the east. To the west, the Baboquivari Mountains with its distinctive peak dominate the landscape. The Tohono O'odham Nation borders much of the northern and western sides of the Altar Valley, while the San Xavier District of the Tohono O'odham nation and the Pasqua Yaqui Nation are located in the northeastern portion of the subarea.

Vegetation varies with the topography of the Altar Valley. The madrean evergreen oak community can be found at the highest elevations. Palo verde, saguaro and ironwood are found in the mountain bajada regions, while grasslands occur at lower elevations and closer to the Altar Wash. As one may expect with this variety of vegetation, wildlife species are exceptionally diverse. The Cerro Colorados boast an impressive roster of species, including, mule deer, white-trail deer, javelinas, and coatimundis, as well as cliff-dwelling raptors such as the rarely-seen golden eagle. Further south in the Buenos Aires National Wildlife Refuge, riparian habitat along the Altar and Puertocito Washes are especially important for migrating neotropical birds.

The region is home to a number of working ranches including the Marley, Sopori, Rancho Seco and Santa Lucia. The potential exists for several thousand acres of private ranch land to be sold at some point in the future for development purposes. Pima County hopes to keep as much of these lands in their natural state as possible by earmarking them for conservation, and then seeking creative ways to secure their protection. One such effort is the proposed Sierrita Ranch Conservation Area, which would protect the Sierrita Mountain range located immediately west of the Green Valley area.

In addition to the Sierrita Ranch Conservation Area, the Sonoran Desert Conservation Plan proposes creation of the 14,254 acre Cerro Colorado Mountain Park. Virtually all of the Cerro Colorado range is State Trust land, and the creation of this proposed mountain park will not only protect the range's valuable natural and cultural resources, but its rare, unspoiled 360-degree viewshed as well. The Sonoran Desert Conservation Plan also proposes the creation of a number of biological linkages from existing public lands such as Tucson Mountain Park and Buenos Aires National Wildlife Refuge to other natural open space preserves and corridors.

GAP Status of the Altar Valley Subarea

The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing

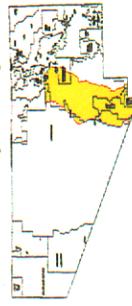
Figure 36

Altar Valley

SDCP PLANNING AREA 6A

- Major Streets
- Major Washes
- Sub-Area Boundary
- FWS Pygmy Owl Critical Habitat Units
- Coronado National Forest
- Buenos Aires National Wildlife Refuge
- Baboquivari Wilderness Area
- Coyote Mountains Wilderness Area
- Tucson Mountain Park
- Bureau of Reclamation Wildlife Mitigation Corridor
- Saguaro National Park West
- Saguaro National Park West Wilderness Area
- Ironwood Forest National Monument
- Wildlife Corridor Links

Pima County Index Map



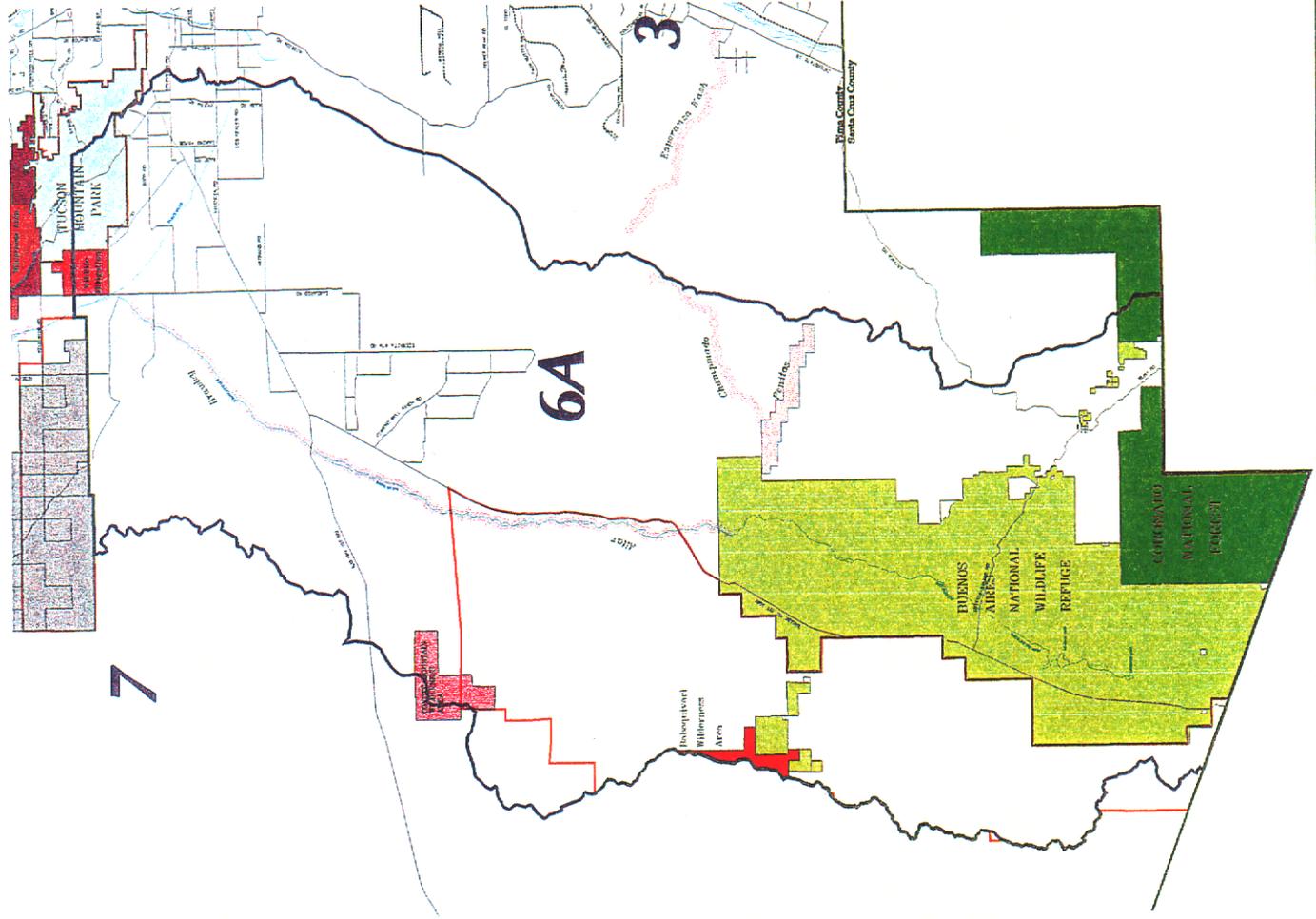
Index Map Date: 11/20/00

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Scale: 1:110,000



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the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 21).

The Altar Valley has 166,549 acres of protected land, including lands managed by the U.S. Bureau of Reclamation, U.S. Bureau of Land Management, U.S. Forest Service, Pima County, and Fish and Wildlife Service (see Table 21). Reserved land totals 23 percent in this subarea. Land outside of existing reserves (unreserved Status 4 land), including private, state, or other land, total of 547,258 acres.

The addition of over 17,869 potential reserve acres would total 184,418 acres of protected land, or 25 percent of the subarea in Status 3b or higher. The remaining 75 percent is unreserved Status 4 land.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the Multi-species Habitat Conservation Plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 22 lists the priority vulnerable species.

Vulnerable Biological Resources

Habitats most at risk include Critical Habitat for the cactus ferruginous pygmy owl, semidesert and Sonoran savanna grasslands, areas of ironwood forests, riparian and xeroriparian areas, the Arivaca Cienega, stream segments with perennial flows, and areas of shallow groundwater. Table 22 lists priority streams and springs found within this subarea.

Existing Stressors

The primary stressors of the Altar Valley subarea are habitat degradation, habitat fragmentation, conversion of vegetative cover, invasive species, human use and overuse and decline in water quality. Activities contributing to biological stress are attributed to the effects of drought, overgrazing, fire suppression, introduction of invasive species, recreational activities, lot-splitting, mining, and illegal border crossings.

A primary consideration for this area is retaining adequate surface flows and ground water levels to support the Arivaca Creek and Cienega. Vulnerable species directly affected by this include the Gila topminnow, Chiricahua leopard frog, lowland leopard frog, western yellow-billed cuckoo, and the Mexican garter snake. Native frogs and the Mexican garter snake face

Table 21

Existing Reserves of the Altar Valley Subarea

Land Manager	Existing Reserves	Total Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
U.S. Bureau of Land Management	Baboquivari Wilderness Area	2,058	x					
	Coyote Mountain Wilderness Area	3,726	x					
U.S. Fish and Wildlife Service	Buenos Aires National Wildlife Refuge	121,299	x					
Pima County	BOR Wildlife Mitigation Corridor	1,938			x			
U.S. Forest Service	Coronado National Forest	30,375					x	
Pima County	Tucson Mountain Park	7,153			x			
Total Acres of Existing Reserves		166,549						
Total Acres of the Altar Valley Subarea		713,807						

Potential Reserve Expansions of the Altar Valley Subarea

Land Manager*	Potential Reserve Expansions **	Acreage	GAP Status					
			Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Pima County	Tucson Mountain Park expansion	3,615					x	
	Cerro Colorado Mountain Park	14,254					x	
Total Existing and Potential Reserves		184,418						
Total Acres of the Altar Valley Subarea		713,807						

*Management may change with acquisition of land.

*Until further planning is done, the GAP status of potential reserves cannot be known. It is assumed the level of protection will be Status 3b or higher.

Table 22: Altar Valley Priority Vulnerable Species, Spring, and Streams

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Arivaca Creek	22 spring locations
<i>Lasiurus xanthinus</i> Western yellow bat	Arrieta Wash	2 Tohono O'odham
<i>Lasiurus blossevillii</i> Western red bat	Asolido Wash	1 private
<i>Leptonycteris curasoae</i> Lesser long-nosed bat	Fresnal Wash	9 State
<i>Macrotis californicus</i> California leaf-nosed bat	East Fork Apache Canyon	4 U.S. Forest Service
<i>Peromyscus merriami</i> Merriam's mouse	Fraguita Wash	4 U.S. Fish and Wildlife Service
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat	Las Moras Wash	2 U.S. Bureau of Land Management
<i>Aimophila carpalis</i> Rufous-winged sparrow	McCafferty Canyon	
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	Penitas	
<i>Athene cunicularia</i> Burrowing owl	Pozo Hondo Wash	
<i>Pipilo aberti</i> Abert's towhee	Sabino Wash	
<i>Vireo belli</i> Bell's vireo	Brown Canyon	
<i>Buteo swainsoni</i> Swainson's hawk	Cedar Canyon	
<i>Glaucidium brasilianum cactorum</i> Cactus ferruginous pygmy-owl	Sopori Wash	
<i>Terrapene ornata luteola</i> Desert box turtle	Thomas Canyon	
<i>Cnemidophorus burti stictogrammus</i> Giant spotted whiptail	Saucito Wash	
<i>Thamnophis eques magalops</i> Mexican garter snake	San Luis Wash	
<i>Chionactis occipitalis klauberi</i> Tucson shovel-nosed snake	Unnamed tib. to Arivaca Creek	
<i>Rana yavapaiensis</i> Lowland leopard frog		
<i>Rana chiricahuensis</i> Chiricahua leopard frog		
<i>Cyprinodon m. macularis</i> Desert pupfish		
<i>Poeciliopsis o. occidentalis</i> Gila topminnow		
<i>Sonorella sp.</i> Talus snail		
<i>Coryphantha scheeri robustispina</i> Pima pineapple cactus		
<i>Tumamoca macdougallii</i> Tumamoc globeberry		

competition and predation by non-native and invasive species such as bullfrogs, largemouth bass, and other stocked sport fish.

Potential Stressors

The potential for conversion of ranches, lot-splitting, and wildcat subdividing are serious growth concerns. Increased growth will lead to increased habitat fragmentation and groundwater pumping.

Mining could have a negative impact on this watershed due to the presence of medium to high mineral potential in the San Luis Mountains. Effects on biological resources from mining could include large-scale degradation of intact areas, habitat loss and fragmentation, potential for downstream watershed contamination, and intensive groundwater pumping to support mine operations. Riparian communities at Arivaca Creek and the Cienega would be most affected.

Ranching

With the establishment of the freight and stagecoach line by the Aguirre family in 1868, the Altar Valley became more easily accessible for exploration and settlement. Although initially drawn to the valley by the prospect of mining, rapid depletion of the ore bodies refocused local enterprise to ranching. Soon other homesteaders came to the valley and sought to capitalize on its rich grassland environment and growing cattle market. With the exception of the Robles and Buenos Aires ranches, some 31 ranches continue in operation in the Altar Valley today. Many of these ranches include private lands from the original homesteads combined with state and federal leased lands.

There are only a few places in the valley where food and fiber products are being produced. In 1956, Robert Buckelew purchased a farm near Robles Junction that eventually grew to 900 acres. In more recent times, his farm was reduced to one-third of its original size as a consequence of the City of Tucson's efforts to purchase water rights. The Buckelew Farm still produces cotton, corn and other crops. In the fall, the farm is open to the public for the annual pumpkin harvest.

Cultural and Historical Resources

The cultural and historic resources of the Altar Valley are relatively unknown because only five percent of the subarea has been surveyed. Despite the limited coverage, current knowledge indicates Altar Valley has seen over 11,000 years of human history. This makes the Altar Valley one of the few basins in the region to contain a record of each period in the sequence of human development. Such an archaeological record makes the Altar Valley a place of potentially high scientific and educational value.

Arivaca and Sasabe are historic communities, products of the 19th century frontier settlement. Both towns and the ghost town at Cerro Colorado may contain archaeological and architectural

assets. In addition, Baboquivari Peak, the landmark peak on the western side of the Altar Valley, is a significant traditional cultural place of the Native American peoples.

Since the majority of the subarea is composed of State Trust Lands, and these lands are potentially convertible to private development lands, there is a need to identify cultural and historical resources, evaluate their significance and, where warranted, protect them for future generations.

Recreational Resources

The Altar Valley is rural and remote, but nonetheless offers outstanding recreational opportunities for a broad spectrum of users.

The Cerro Colorado Mountains are situated within the subarea, and this compact range, which is mostly composed of State Trust Land, has been proposed for designation as a 14,254 acre Pima County mountain park. Access to the Cerro Colorados is easy via Arivaca Road and the Batamonte Road, but no developed trails exist in these mountains. The hiking opportunities are essentially cross-country in nature; however, a few cow and wildlife paths and primitive access roads do exist on the lands surrounding the range, and offer trail experiences for more adventurous hikers, mountain bikers, and equestrians. The best features of the Cerro Colorados are its 360-degree viewshed and the outstanding solitude and natural quiet it offers. A State Lands recreation permit is required to access these opportunities.

The lands within the Sierrita Ranch Conservation Area are principally State Trust Land and BLM land, and offer primitive recreational trail opportunities for those hardy enough to seek them out. No formally developed trails or trailhead staging sites exist in the area, but a variety of primitive roads offer both trail opportunities for motorized and non-motorized users and access to these mountains. As with the Cerro Colorados, a recreational use permit is necessary to recreate legally on the State Trust Lands within the range.

The Buenos Aires National Wildlife Refuge, a 121,308 acre refuge that was established in 1985 to provide protected habitat to support the reintroduction of the masked bobwhite quail, encompasses over 200 miles of backcountry roads open to motor vehicles and mountain bicyclists. Equestrians are allowed to use any of the refuge roads north of Arivaca Road for recreational purposes. Routes in the more rugged terrain southeast of the refuge headquarters are considered ideal for mountain biking. Hiking opportunities include the many backcountry roads and the challenging five-mile (round trip) Mustang Trail, which offers solitude as well as an good hike. The area also offers opportunities for environmental studies that relate to riparian habitats, wetlands, and native and disturbed grasslands.

The 2,065-acre Baboquivari Peak Wilderness, located at the western edge of the Altar Subarea, is located approximately 60 miles from Tucson and derives its name from the striking 7,730-foot peak that is the focal point of the range. The principal recreational opportunity in the wilderness is hiking. A steep, rough, informal trail that emanates from Thomas Canyon

provides access to the vicinity of the peak, where hikers are rewarded with spectacular views. The peak is popular with rock climbers as well.

Established in 1990, the 5,080-acre Coyote Mountain Wilderness is located along the western edge of the subarea roughly 40 miles from southwest of Tucson and 6 miles east of Kitt Peak. This spectacular landscape of rugged peaks and sheer cliffs has no formal trail system, but offers inspiring hiking opportunities for hardy explorers. Access to the wilderness has been an issue in the past, and visitors should check first with the BLM's Tucson Field Office prior to visiting the area.

Roughly 30,000 acres of the Coronado National Forest's Nogales Ranger District is located within the Altar Subarea, and this forest district offers an array of primitive recreational opportunities for outdoors enthusiasts, include hiking, mountain biking, horseback riding, and off-road vehicle use. The entire district covers 370,000 acres of land, and is headquartered in Nogales.

As with the Tortolita Subarea, the Altar Subarea contains a large quantity of State Trust Land. These Trust Lands, some of which have been used for grazing and other purposes, offer outstanding recreational opportunities for outdoors enthusiasts. A good example is the area between the Cerro Colorado and Sierrita Mountains. While no developed trails exist in this area, lots of primitive jeep roads, cattle paths and animal trails are available for exploration. As with all State Trust Lands, a \$15 recreational use permit is required.

Only a few trails listed on the *Eastern Pima County Trail System Master Plan* are located within the Altar subarea. This is because the Trails Master Plan is principally focuses on the Tucson metro area, and the lands within the Altar subarea are generally rural and remote. However, several Master Plan-listed trails do exist in the subarea, including:

- Batamonte Road (Trail #296) - provides access to the area surrounding the Cerro Colorado Mountains.
- Proctor Wash/Bob Brown Lateral (Trail #81) - links the Sierrita Range with the Cerro Colorados.
- Cerro Colorados South Access Road (Trail #820 - provides access to the Cerro Colorados from Arivaca Road.
- Sierrita Mountain Road (Trail #121) - links the Ajo Highway with the Fresnal Wash.
- Ash Wash (Trail #75) - provides access to the Sierrita Mountains.
- Fresnal Wash (Trail #79) - provides access to the Sierrita Mountains.
- Sandario Road (Trail #119) - a regional connector trail that connects Avra Valley Road (Trail #16) to Sierrita Mountain Road (Trail #121).
- CAP Trail (Trail #3) - links Tucson Mountain Park with Tortolita Mountain Park.
- Brawley Wash (Trail #11) - stretches from the Pinal County line to the Pascua Yaqui Nation's northern boundary.

The rural and remote nature of the vast majority of the Altar Subarea provides an excellent setting for hunting. The subarea includes Arizona Game and Fish Units 36A, 36B, and 36C, which offer hunting for such large game as javelina, mule deer and white-tailed deer, and smaller game such as cottontail rabbit, dove, feral hog, and quail. The mountain ranges in the area, including the Sierritas, Cerro Colorados, Las Guijas, and Baboquivaris, all are open to hunting during the appropriate season (and in accordance with Arizona Game and Fish regulations). Hunting is also allowed on the Buenos Aires National Wildlife Refuge, per refuge rules.

Existing Policies

Tucson Mountain Park--Tucson Mountain Park is the oldest Pima County Park and many of the policies that now apply to other parks were originally established for TMP under Arizona Administrative Code: Title 12 Chapter 12. As duly authorized by State Statute, the Parks and Recreation Commission has the authority under ARS 11-931 to establish policies applicable to all County Parks. The following codes are applicable to Tucson Mountain Park:

- 12-12-01 Domestic Animals
- 12-12-02 Intoxicants
- 12-12-03 User Fees
- 12-12-04 Use and Occupancy of County Parks
- 12-12-05 Violation and Penalty

For a complete listing of public use and resource policies for other reserves in this subarea, please consult Tables 23 and 24, or contact the land management agency.

Table 23: Altar Valley Public Use Policies

Managing Entity	Reserve Name	Public Use Policies													Comments			
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Plinking	Shooting Range	Fishing		Swimming	Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	R	R	R	NA	R	R	Consult Appropriate Agency
USDI Bureau of Reclamation	BOR Wildlife Corridor	Y	Y	Y	Y	NA	N	N	N	N	N	N	N	N	NA	NA	NA	
U.S. Forest Service	Unreserved Coronado National Forest	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
U.S. Fish and Wildlife Service	Buenos Aires National Wildlife Refuge	Y	Y	Y	Y	Y	R	R	R	R	R	R	R	R	NA	NA	NA	
Pima County	Tucson Mountain Park	Y	Y	Y	Y	N	N	R	N	N	N	Y	NA	NA	NA	N	N	
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Table 24: Altar Valley Resource Policies

Managing Entity	Reserve Name	Resource Management Policies														Comments					
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.
Varies	Wilderness Areas	R	N	P	N	Y	N	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	
USDI Bureau of Reclamation	BOR Wildlife Corridor	N	Y	P	P	N	N	N	Y	N	N	N	N	N	Y	Y	N	N	N	Y	
U.S. Forest Service	Unreserved Coronado National Forest	P	Y	Y	Y	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
U.S. Fish and Wildlife Service	Buenos Aires National Wildlife Refuge	P	P	P	P	P	P	P	P	R	R	Y	Y	Y	N	Y	Y	Y	Y	Y	
Pima County	Tucson Mountain Park	N	Y	P	P	P	P	N	N	P	N	Y	Y	Y	Y	Y	Y	N	Y	Y	
BLM	Ironwood National Monument	N	P	P	P	Y	R	N	N	N	N	Y	Y	N	N	Y	Y	N	Y	N	Management subject to change
BLM	Waterman ACEC	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

This table contains the most accurate information available at the time of printing. For current information, please contact the land management agency.

Opportunities for Protection

Expansion of Tucson Mountain Park

Background -- Tucson Mountain Park celebrated its 70th anniversary on April 11, 1999, and is the undisputed jewel of the Pima County Mountain Park and Natural Preserve System. This 20,000-acre park is located on the western side of metropolitan Tucson, and is bounded on its northern side by the 24,034-acre Tucson Mountain District of Saguaro National Park (Figure 25).

In addition to the acreage within Tucson Mountain Park that Pima County owns in fee, the County also manages an additional 2,514 acres immediately adjacent to the western boundary of the park owned by the United States Bureau of Reclamation as a protected, access-restricted part of the park. This holding, called the BOR *Tucson Mitigation Corridor*, was established in 1990 to help mitigate the impact of the Central Arizona Project canal on the area's natural wildlife movement corridors between Tucson Mountain Park and natural open space located a short distance to the west, including Brawley Wash, the Schuk Toak District of the Tohono O'odham Nation, and the Roskrige and Waterman Mountains. The manner in which the corridor is managed is set forth in a formal agreement executed between the Bureau and Pima County.

Tucson Mountain Park is home to the Arizona-Sonoran Desert Museum, Old Tucson, and the Sonoran Arthropod Studies Institute, and features some of the most impressive natural Sonoran Desert beauty in the Tucson Basin. Its features include the recently-restored Gates Pass Scenic Gateway and the Gates Pass Overlook, shooting and archery ranges, camping and picnic areas, and a 26-mile shared-use recreational trail system open to hikers, equestrians and mountain bicyclists.

The park also contains some of the most significant wildlife habitat in the Tucson Mountains region, and was included in Unit 2 of the United States Fish and Wildlife Service's June, 1999 critical habitat designation for the cactus ferruginous pygmy-owl.

At the time of its creation in 1929, Tucson Mountain Park was a rural preserve. Today, the once-rural character of the lands surrounding the park is virtually a memory. The beauty of the Tucson Mountains, and the appeal of being located on the edge of a permanently-protected natural area, have attracted residential development of all kinds, as well as commercial development such as golf courses and the Starr Pass Resort. Recently, a new 160-room resort and conference center was proposed for construction near the corner of Gates Pass Road and Camino de Oeste.

Urbanization is in the process of surrounding the park, and this, coupled with a dramatic rise in the value of adjacent undeveloped land, has limited the expansion options for the park. The Sonoran Desert Conservation Concept Plan recognizes the fundamental importance of Tucson Mountain Park in the County's overall resource conservation strategy, and seeks to maintain

its existing viability as a natural preserve and enhance its functionality wherever possible. Toward that end, the acquisition of approximately 3,615 acres of high-resource value adjacent open lands has been discussed in the interest of accomplishing the following specific goals:

- Preservation of significant wildlife habitat, particularly natural washes;
- Establishment of perpetually-protected biological linkages between the park and nearby tracts of natural open space, including Greasewood Park, Tumamoc Hill, and the Santa Cruz River corridor. These linkages will reduce the likelihood that Tucson Mountain Park will become an isolated biological island surrounded by development, facilitate natural wildlife movement, and help assure the health of the wildlife populations in the Tucson Mountains;
- Protection of noteworthy scenic resources on the periphery of the park, including landmark peaks, ridges and other signature features such as the Twin Peaks along Anklam Road and Gates Pass Scenic Corridor;
- Assurance of adequate public access to the park, both to make this regional county park available to the citizens of Pima County, and also to disperse use throughout the park as much as possible in order to lessen cumulative user impacts on natural resources; and
- Preservation of cultural resources.

The achievement of these goals will be aided by two important sources of funding: the 1997 Open Space Bond Program, and the Starr Pass Environmental Enhancement Fund. The 1997 Open Space Bond Program provided a total of \$6.65 million to facilitate the purchase of valuable open space adjacent to the park.

These funds include \$3 million to acquire parcels along Gates Pass Road, at the western end 36th Street, in the Twin Hills area, and adjacent to Tucson Unified School District's Camp Cooper; \$1.8 million for parcels in the Painted Hills area between Anklam and Speedway, and \$1.75 million for parcels in the Robles Pass area south of the Ajo Highway. An additional \$500,000 was provided to acquire up to 125 acres at the northern end of the Tucson Mountains near Continental Ranch to protect valuable archeological resources -- including the *Los Morteros* site and scenic resources.

The other principal source of funding, the Starr Pass Environmental Enhancement Fund, was created to help mitigate the impacts of the Starr Pass resort on Tucson Mountain Park. The Fund, derived from a sales tax increment collected at the resort, is expected to provide a total of approximately \$18.6 million in revenues over a 20-year period to benefit Tucson Mountain Park. The Starr Pass funds will be used to acquire open space parcels adjacent to the park and facilitate the creation of biological corridors.

In addition, an Arizona Preserve Initiative (API) application is being prepared to facilitate the conservation reclassification and eventual acquisition of two parcels of State Trust Land adjacent to the park -- a 60 acre parcel immediately north of Trails End Road in Section 2 of T14S, R12E, and a 40 parcel just south of the Ajo Highway in Section 33 of T14S, R13E. The application is expected to be completed in August, 1999 and will be submitted to the State Land Department.

Tucson Mountains Biological Corridor. Another significant component of the Sonoran Desert Conservation Concept Plan's suggestion to protect and enhance Tucson Mountain Park is the creation of the Tucson Mountains Biological Corridor. The corridor is series of adjacent parcels of natural open space and desert washes intended to link Tucson Mountain Park with other significant protected open lands in the Tucson Mountains area -- including Greasewood Park, Tumamoc Hill, and, ultimately, the Santa Cruz River. The Biological Corridor has four major components: the connection from the Trails End Road vicinity to Greasewood Park; the linkage from the Starr Pass area to Tumamoc Hill; the link between Robles Pass and the Santa Cruz River, and the connection of the Roger, Trails End, Camino de Oeste, Anklam and Enchanted Hills washes, which flow out of Tucson Mountain Park, to the Santa Cruz River. The development of the corridor is presently underway, and is discussed in detail in the Linkages section of this report.

Existing Condition -- At the time of its creation in 1929, Tucson Mountain Park was truly a rural natural resource preserve. Tucson's population at that time was just over 30,000, and the urban core of the Old Pueblo was a considerable distance from the park. Seventy years later, Tucson is a very different place. The population of metropolitan area is nearly 800,000, and Tucson Mountain Park is now virtually surrounded by urbanization. Park visitation has increased significantly over the years, and an estimated 1.2 million vehicles pass through the park every year. An increasing number are commuter vehicles, while others, including large commercial transports such as tour buses, are on their way to attractions like the Arizona-Sonora Desert Museum, Old Tucson, or Saguaro National Park's Red Hills Visitor Center. Almost every conceivable type of residential development can be found in the immediate proximity of the park, from the million-dollar estates in the Trails End area to the manufactured homes in Tucson Estates. Commercial development also dots the periphery of the park, and includes the Starr Pass Golf Course and its planned resort, the strip malls lining Kinney Road, and the fast food and convenience stores along the Ajo Highway. It is clear that the pattern of increasing urbanization in the vicinity of the park will persist in the future. The east side of the Tucson Mountains remains a very popular area, and with a variety of projects in various stages of development, will undoubtedly continue to expand. Several new residential projects are under construction on the south side of the park along Kinney Road, and the large-scale Tucson Mountain Ranch project is expected to get under way in this area soon. In addition, the lands north and west of Tucson Mountain Park and Saguaro West are also poised to grow at a significant rate as the populations of the Avra Valley and town of Marana continue to swell.

Today the park is threatened by a proposal to run a large, high-voltage power line west of the park and through the Wildlife Mitigation Corridor.

Park Concept -- The planning process for the Sonoran Desert Conservation Plan may lead to decisions to change or alter management goals of Tucson Mountain Park. As the first unit in the Pima County's Mountain Park and Natural Preserve System, Tucson Mountain Park has served as the County's mountain park model. Its formula of resource protection and the provision of compatible and complementary recreation opportunities has functioned well. The park is a much-loved and well-used public institution, and its natural and cultural resources have withstood this popularity to date. The park's level of development -- particularly its Old Tucson component -- probably exceeds what was originally intended for the park. The current focus of park management is on preserving as much of the park's primitive and rural character as possible as well as its sensitive resources.

Despite its popularity, Tucson Mountain Park also has its limitations, and these shortcomings have informed the Mountain Park and Natural Preserve System planning process, and helped county staff refine the mountain park model that could be implemented in the system's expansion units.

The principal shortcoming of Tucson Mountain Park from a land manager's perspective is that the park is bisected by roads. The park's principal roads -- Kinney and Gates Pass -- carry a large volume of traffic, including commuter traffic moving from one population area to another, as well as visitors traveling to some of the most popular destinations in southern Arizona. And while the park may close at 10:00 p.m., the roads are open 24 hours, bringing the full complement of challenges attendant with any major roadway into the heart of the park. These difficulties include speeding, reckless driving, drunk driving, resource damage, littering, and traffic accidents.

Road-killed wildlife is also a consequence of the park's interior road system. Having high-volume roadways crossing the park taxes the county's small ranger staff, and by necessity commits them to routine traffic enforcement instead of the resource protection and public contact activities that are the highest and best use of their time.

As a result of this experience, future Pima County mountain parks might consider limiting vehicular access to the perimeter of the park and confine vehicles to existing county roadways wherever possible.

Trailheads, campgrounds, and other developed sites could be located on the outer edges of the new units, and maintenance and administrative vehicles could be the only motorized conveyances allowed beyond these developed sites. In addition to reducing the need for traffic enforcement, limited vehicular access pattern would also help protect the sensitive resources contained within the parks and improve the visitor experience by enhancing natural quiet and solitude.

The other major concern regarding Tucson Mountain Park is its present level of commercial development. Problems associated with the park's commercial uses include the generation of traffic and noise, wildlife impacts, increasing demands on the park's water resources, and higher maintenance costs.

Natural Resources -- The exceptional variety of Tucson Mountain Park's natural resources is a consequence of its location in what is recognized as one of the most biologically diverse settings in southern Arizona. The Tucson Mountains formed from volcanic and fault block activity that began an estimated 70 million years ago. Natural erosion and deposition processes over the millennia generated an extremely heterogeneous landform that supports a diverse biological community.

The vegetation within the Tucson Mountains is classified as a subtropical desertland located within the Arizona Upland subdivision of the Sonoran Desert. A variety of plant communities and associations are represented within this category, with the most prevalent being the palo verde-saguaro association. No federally-listed threatened or endangered plant species have been positively identified to date within the Tucson Mountain Park, but several uncommon species, including night-blooming cereus and Tumamoc globeberry, are known to occur. The park is home to large and healthy populations of saguaro, prickly pear, barrel, cholla and ocotillo cactus, mesquite, palo verde and ironwood trees, and a variety of other Sonoran desert vegetation.

Tucson Mountain Park's exceptional desert vegetation provides habitat for a multiplicity of wildlife. More than 230 vertebrate species are common to the area, as well as literally thousands of invertebrates.

Typical animal species found in the park include coyotes, javelina, cottontail and jackrabbits, and mule deer. Other noteworthy wildlife found in the park include bobcats, gray foxes, mountain lions, desert tortoises, Gila monsters and a variety of bats and bird species. Sensitive species that may be found in the park include the Lesser long-nosed bat and the California leaf-nosed bat. The possibility that the cactus ferruginous pygmy-owl may use the park, and the suitability of its habitat for this listed endangered species, led to the inclusion of Tucson Mountain Park in Unit 2 of the U.S. Fish and Wildlife Service's recent critical habitat designation for the owl.

The park's resources continue to remain in excellent natural condition. However, a variety of resource management concerns have arisen as a result of increased use of the park and urban encroachment that are capable of impacting the park's resources over time. These issues include:

- Impacts of off-trail use-- The number of unapproved wildcat or social trails created in the park--first by hikers and now by other users--have slowly increased in recent years, and staff is taking steps to ensure that these trails do not impact the park's resources. An inventory of all existing park trails will occur as a part of the development of the

park's trails plan, and trails identified as resource-damaging will be closed and revegetated.

- Domestic pets . Domestic dogs and cats have the potential for disturbing wildlife and its habitat. Hikers that bring their dogs to the park and do not observe leash laws are a growing problem, and free-roaming pets can enter the park from nearby homes.
- Exotic Plants and Animals. Exotic plants and animals of varying kinds impact park resources. The County is pursuing measures to foster their removal. For instance, buffel grass and fountain grass are two exotic species that can now be found in a few scattered locations along park roads and washes, and an effort is being made to remove this species from Tucson Mountain Park using both park staff and volunteers.
- Human feeding of wildlife. While not presently a serious problem in the park, the potential for significant problems to develop from feeding wildlife exists for both for wildlife and humans.
- Road-killed wildlife. The large quantity of traffic passing through the park--some of it fast-moving--means that road kills are inevitable. Enforcement of the park's speed limits have helped mitigate this problem to a certain extent, but additional measures will need to be considered if the level of road kills continues to grow.

Cultural Resources -- Tucson Mountain Park contains a variety of valuable cultural resources, including prehistoric archaeological sites, rock art sites, historic structures, old mines and trails, traditional O'odham saguaro fruit gathering sites and other traditional cultural places, and natural features of the land that together form a significant cultural and historic landscape. While very little of the park has been systematically surveyed for cultural resources, the Depression-era complex of facilities designed for Tucson Mountain Park has been determined eligible for listing on the National Register of Historic Places. What is known about the nature of the cultural resources in the Tucson Mountains is that some of the earliest sites have been recorded in the range. Later Hohokam sites are also known in the area, and like their predecessors appeared to have used the mountains for resource gathering and hunting. Rock art sites are numerous, but few actual village sites are recorded. It is certain that the prehistoric sites in the Park are a part of the regional settlement and land use system of the Tucson Basin Hohokam. More survey and future research is necessary to better characterize what role the Tucson Mountains played in prehistoric settlement.

The Park also contains a number of historic sites and features reflecting O'odham use of the area, mining, quick-lime production, and the Depression-era Park facilities designed in 1937 to enhance the natural and cultural qualities of the park and to promote tourism as a form of economic recovery. These park improvements constructed by the Civilian Conservation Corps included roads, picnic grounds, recreational areas, campsites, and drainage and erosion control features, and the Camp Papago Pima County Preventorium for children with respiratory

diseases, which later became the Gilbert Ray Campground. These historic Park structures are present today in both Tucson Mountain Park and Saguaro National Park.

Recreation Potential -- Tucson Mountain Park has been one of the Tucson area's most popular outdoor recreation destinations for many decades, and presently offers a variety of low-impact recreational opportunities.

The park's most popular recreational resource may be its 26 miles of shared-use recreational trails, which are open for use by hikers, equestrians and mountain bicyclists. While 26 miles of trail may seem like a large number, the adjacent Tucson Mountain District of Saguaro National Park, which is more strictly preservationist in orientation and just 5,000 acres larger, contains more than 50 miles of designated trails. Tucson Mountain Park's existing non-motorized shared-use pattern presently works well, and while an exact count has yet to be performed, bicyclists comprise park's largest trail user group.

A comprehensive review of the park's trails-based recreation opportunities and trails-related policies will occur when the development of a new trails plan for the park begins late 2000. Every existing trail in the park will be inventoried, and a revised system will be recommended based on the outcome of the Sonoran Desert Conservation planning process. The recommendation could include the closure of redundant and/or resource-damaging wildcat or social trails, enhancements to the system that make sense (logical connections and improvements, etc.), uses that might occur on particular trails, and as well as a schedule of trail system-related capital improvements -- i.e. bond-funded trailhead development, new trail construction, trail maintenance, signage, interpretation, fencing, and more. The park's other current recreational amenities include an archery range, a rifle range, picnicking facilities, and a campground.

Public access to the park and its trails will be enhanced through funds earmarked for trailhead development in the 1997 Open Space Bond Program. The Open Space Bond will provide funding to construct formal trailhead parking facilities for the Starr Pass East access point near the Starr Pass Resort, at the western end of 36th Street, and adjacent to the City of Tucson's Kennedy Park. In addition to these facilities, two new trailhead parking areas will be built by developers as a part of projects they are pursuing along Kinney Road in the vicinity of the Tucson Estates subdivision.

One of the trailheads will be constructed alongside Tucson Estates Parkway just outside of the main gate of Tucson Estates, and another will be built at the point where Sarasota Road meets the park boundary. The design of both facilities will be overseen by Parks Department staff, but will be funded by private development entities.

Recreation-related decision making for the park will occur within the context of protecting the habitat of the cactus ferruginous pygmy-owl and other species as prescribed by the final Sonoran Desert Conservation Plan.

As an interim measure, since the entirety of Tucson Mountain Park, as well as the U.S. Bureau of Reclamation's Tucson Mitigation Corridor, is included in Unit 2 of the U.S. Fish and Wildlife Service's critical habitat designation for the owl, care will be taken to ensure the habitat this species needs to thrive is not compromised in any way.

Linkages to Other Protected Natural Areas -- One of Pima County's biggest open space conservation challenges is keeping Tucson Mountain Park a viable natural area as urbanization continues to close in around it. Pima County has been aware of this need for some time, and began taking steps to address the issue prior to the development of the Sonoran Desert Conservation Concept Plan. The Plan provided the opportunity to take a comprehensive look at how the park could be connected to other natural open space preserves and corridors, and resulted in the development of the following possible linkages.

(1) Northern Linkage. Tucson Mountain Park abuts the Tucson Mountain District of Saguaro National Park along its northern boundary, so it would appear that this part of the bio-linkage equation has been solved. However, a look at the larger context in which both units are situated will reveal that the West Unit of Saguaro National Park faces the same dilemma as Tucson Mountain Park. Saguaro West is also being surrounded by urbanization, and its natural biological linkages to other open space areas are similarly being impacted and compromised. The proper approach seems to view Tucson Mountain Park and Saguaro West as a single entity, which is appropriate, given that both units are seeking to protect large portions of the same mountain range, and were in fact a single unit from 1929 until 1961. However, achieving some sort of biological connection from the Tucson Mountains north and east to the Santa Cruz River and then the Tortolita Alluvial Fan and Ironwood Forest will be difficult, because the growing town of Marana, Interstate 10, and the Central Arizona Project canal all stand in the way. A solution would seem to require the protection of the remaining State Trust Land north of the park and the involvement of some private land presently (or formerly) under cultivation, which is likely to be extraordinarily difficult. Any biological corridor solution in this area will require the direct participation of the town of Marana.

(2) Western Linkage. Connecting Tucson Mountain Park and Saguaro West to open space located west of both units will be considerably easier than securing a northern linkage. The western end of Tucson Mountain Park abuts the U.S. Bureau of Reclamation's 2,514-acre, 4-square mile Tucson Mitigation Corridor, which was established in part to help facilitate this connection. One half mile of private property separates the western edge of the Mitigation Corridor from a large block of property owned by Tucson Water, which in turn abuts the proposed eastern boundary of the proposed Waterman-Roskrige Mountain Park. Tucson Water's Avra Valley property has been earmarked for conservation purposes by the Tucson City Council, so the likelihood that this property will remain undeveloped is excellent. While the rudiments of a linkage between the Tucson Mountains and the Waterman and Roskrige Mountains--and thus the Tohono O'odham reservation--is already in place, certain aspects of the connection are problematic. The potential linkage between the Mitigation Corridor and the Tucson Water Property is only .5 mile in width, and at least

two other sections of adjacent private property would need to be included in the linkage in some manner (through conservation easements, development rights acquisitions, etc.) to make the linkage truly viable. In addition, the high-speed Sandario Road corridor passes through the linkage, and presents a significant stumbling block for safe wildlife movement. Despite these challenges, the western linkage has a great deal of potential, and this promise led to its preliminary consideration as part of the Sonoran Desert Conservation Concept Plan.

(3) Southern Linkage. Linking Tucson Mountain Park to open space south of its boundary also has promise and limitations. The potential comes from the acquisition of a tract of property formerly owned by the Rollings Family south of the Ajo Highway (Section 32 of T14S, R13E), as well as an adjoining parcel on its eastern boundary. Funding was provided in the 1997 Open Space Bond Program (Project #SD-3) to facilitate the acquisition of this property.

Also abutting the former Rollings section is a 40-acre parcel of State Trust Land that is the subject of an Arizona Preserve Initiative application that has been approved for submission by the Board of Supervisors. These properties could conceivably be linked to several other vacant parcels located to the east to ultimately to form a connection with the Santa Cruz River Corridor. The limitations of this proposed linkage come from the broad and high-speed Ajo Highway, which forms a daunting wildlife barrier, Mission Road, which impacts the link to the Santa Cruz, and the existing level of development in the area, which surrounds the subject corridor lands.

(4) Eastern Linkage. Linking Tucson Mountain Park to protected open space areas located to the east and the Santa Cruz River corridor is another opportunity that holds considerable promise. Both the City of Tucson's Greasewood Park and the University of Arizona's Tumamoc Hill research station can be linked to Tucson Mountain Park through open land and wash corridor acquisition, and efforts are well under way to achieve this goal.

Four corridors emanating from the park that pass through the Starr Pass development and eventually connect with the Tumamoc Hill property were protected as a part of the development plan for the Starr Pass resort. The acquisition of these links will be paid for through the Starr Pass Environmental Enhancement Fund, which will derive its revenues from the sales tax increment collected at the Starr Pass Resort.

The effort to connect Tucson Mountain Park to Greasewood Park is also well underway, and has been facilitated by the purchase of six parcels to date using 1997 Open Space Bond Funds and the Starr Pass Fund. Several large and expensive parcels between the recently-purchased parcels and Greasewood Park, including the Painted Hills area, remain to be acquired, but success is within reach. Also included in the effort to secure biological links from the park eastward are five natural wash corridors that extend from the park to the Santa Cruz River.

These washes include both legs of the Roger Wash, the Trails End Wash, the Camino de Oeste Wash, the Anklam Wash, and the Enchanted Hills Wash. While these corridors have been impacted to varying degrees by urban development and will in some cases require a considerable degree of restoration, they offer the best hope for the future of assuring a biological connection between the park and the Santa Cruz.

All of these efforts are collectively known as the Tucson Mountains Biological Corridor Project, and importance of the project led to its inclusion in the Sonoran Desert Conservation Concept Plan.

Implementation -- The enhancement and protection of Tucson Mountain Park is presently underway, and involves a range of activities. These efforts include:

Acquisition of parcels for Tucson Mountain Park identified in the 1997 Open Space Bond Program. The 215-acre Diocese of Tucson parcel located along Gates Pass Road was acquired in the spring of 1998, and acquisition has been completed on a 746- property south of the Ajo Highway formerly owned in part by the Rollings family. Funding to facilitate the acquisition of a 320-acre parcel within the University of Arizona's Tumamoc Hill Desert Laboratory site was also included in the bond, and it is anticipated that this acquisition will occur sometime in the fall of 2000. The Tumamoc Hill property is the subject of Pima County's first application for matching funds from the Growing Smarter grant program; a \$1.4 million matching grant request was submitted to Arizona State Parks for consideration on March 31, 2000.

The establishment of the Tucson Mountains Biological Corridor. Six parcels have recently been acquired in the effort to establish the corridor, and several more are under negotiation. Recent acquisitions include several properties along Trail's End Road, including the 155-acre Saguaro Cliffs parcel; 38, 57 and 200-acre parcels around and near Camp Cooper owned by the same absentee landowner; the 10-acre Holsclaw property at the corner of Gates Pass Road and Camino de Oeste, and the 50-acre parcel that will form the county's Feliz Paseos park. Most of these recently-acquired parcels, with the exception of the Feliz Paseos property, will become a part of Tucson Mountain Park.

Development of an API application covering two State Trust Land parcels near the park. Conservation reclassification under the API program could be requested for a 60-acre parcel just north of Trails End Road and a 40-acre parcel abutting the Rollings property south of the Ajo Highway.

Exploration of the addition of BLM property to the park. Parks and Recreation Department planning staff is presently evaluating the possibility of adding more than 600-acres of BLM land located along the southern boundary of TMP to the park. These lands, which are within the park's SDCP expansion boundary, were identified for addition to TMP in the 1988 Phoenix District Resource Management Plan. The addition of this land to the park will depend on the disposition of the property's existing mining claims. If the claims can be dealt with satisfactorily, then the property will be acquired by Pima County at low cost through the federal Recreation and Public Purposes Act (R&PP) process.

Cerro Colorado Ranch Conservation Area

Background -- Compared to the sprawling mountain ranges that house county natural areas, the Cerro Colorado Mountains, which cover an area of about 13 square miles, are relatively small (Figure 37). Despite its less-than-imposing stature, this compact range, named for its rocky red volcanic form, is among the most scenic and biologically diverse in southern Arizona.

The craggy peaks of the Cerro Colorados, located less than 6 miles due south of the Sierrita Mountains and immediately north of the Arivaca Road, rise above the surrounding countryside to a height of 5,319 feet. These mountains are nearly pristine, and boast lush bajadas surrounded by broad plains covered with unbroken Sonoran Desert upland and riparian vegetation.

Of the 14,254 acres of land within the boundary of the proposed mountain park, 10,863 acres are State Trust Land. The remaining property is divided between public lands administered by the U.S. Bureau of Land Management (1,980 acres) and privately-owned property (1,411 acres). Virtually all of the Cerro Colorado range itself is State Trust Land, except for a half section island of private property at the very top of the range owned by the Marley Cattle Company.

The hospitable topography and ample vegetation of the plains that surround the Cerro Colorados make the area ideal cattle country, and several working ranches, including the nearby Marley, Sopori, Rancho Seco and Santa Lucia ranches, continue to operate in and around the proposed park. The Marley Cattle Company holds the grazing lease for the majority of the range. Silver mining occurred in the area surrounding the mountains in the 1800's, and several old extraction sites dot the area, including the Cerro Colorado or Hintzelman mine, and the Mary G mine.

The proposed ranch conservation area was included in the Sonoran Desert Conservation Concept Plan for several reasons. One of the most important reasons is to protect the unspoiled Cerro Colorado mountain range and its exceptional natural resources. The range supports an abundance of wildlife, including mule deer, white-trail deer, javelinas, and coatimundis.

An endangered jaguar was reportedly seen in the range in 1997. The park will also help protect the Cerro Colorado's watershed, as well as undisturbed tracts of rare high desert grassland on the upper portions of the mountains.

Another important purpose of the conservation area is the protection of the range's viewshed, which is unimpaired, and a truly impressive sight for a full 360 degrees. The western face of the mountains is particularly picturesque, with unusual and highly scenic rock formations interspersed with dense vegetation.

Figure 37

Cerro Colorado Mountain Park

- Parcel Base And Streets
- Township And Range Lines
- Section Lines
- Washes
- Administrative Boundaries
- Proposed Park Boundaries
- Trails
- Wildlife Corridor Links
- Proposed Mountain Parks
- Riparian Habitat /Wildlife Corridor Link
- Bureau Of Land Management (BLM)
- Private Lands
- State Trust Lands
- Buenos Aires National Wildlife Refuge
- Coronado National Forest

CERRO COLORADO MOUNTAIN PARK:
 State: 10,863 Acres
 Federal: 1,990 Acres
 Private: 1,411 Acres

Pinia County Index Map



Index Map Date: 11/20/2009

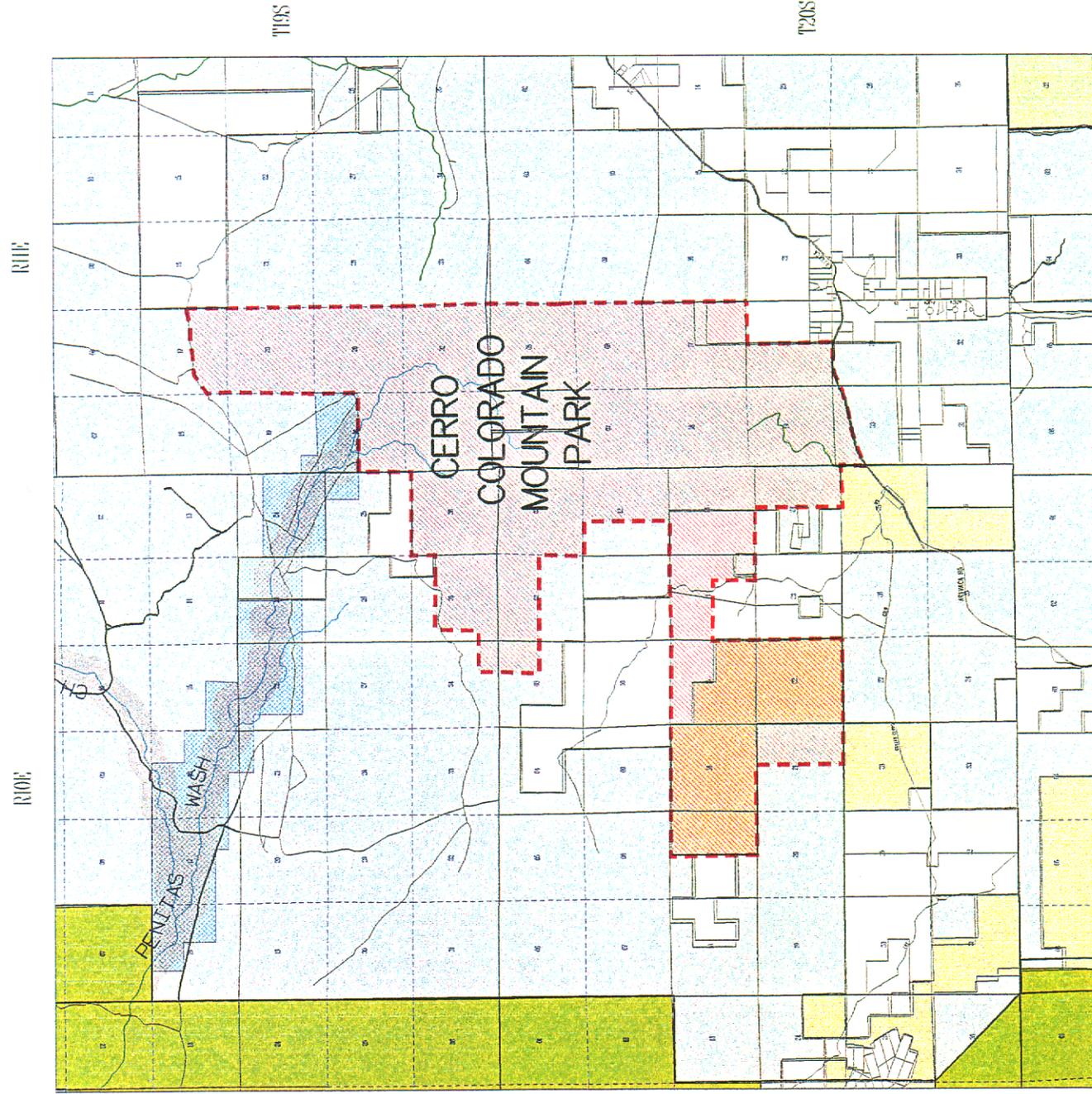
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Also of considerable importance is the ability to link the entirety of the proposed park to the nearby Buenos Aires National Wildlife Refuge and the Las Guijas Mountains. An overland linkage to the refuge could easily be established using a combination of BLM land and State Trust Land.

Another very valuable linkage identified in the Sonoran Desert Conservation Plan is the Penitas Wash corridor. The Penitas Wash flows out of the northwestern slopes of the range and connects with the northeastern corner of the Buenos Aires Refuge. The Penitas Wash corridor proposed for protection in the Sonoran Desert Conservation Plan encompasses 3,183 acres and is virtually a small natural preserve unto itself.

The Penitas Corridor includes a section of the Champurrado Wash, which drains the southern slopes of the Sierrita Mountains and intersects with the Penitas Wash just outside the refuge.

The vicinity of the Cerro Colorados offers strong recreation potential. While the range itself is more suited to hardy hikers, the broad, relatively flat lands surrounding the park are ideal for recreational trail use. Pima County also recognizes the value of ranch uses that are consistent with conservation goals.

Existing Condition -- The proposed Cerro Colorado Ranch Conservation Area is located in a remote rural area approximately 35 miles southwest of Tucson. Green Valley, the largest nearby population center, is about 20 miles away. The proposed park is located roughly at the midpoint between the small communities of Arivaca and Arivaca Junction 11 miles west of I-19, and is readily accessible via the Arivaca Road, a high-quality two-lane rural highway.

The lands within the park are generally in excellent natural condition. The park is surrounded by a large quantity of undeveloped, essentially flat land, the majority of which is owned by the State Land Department and private property owners. These lands are also in very good condition. The Trust Lands and BLM land surrounding the park are leased by local ranchers for grazing purposes. Several ranches currently operate in the area, including the Marley, Sopori, Rancho Seco and Santa Lucia ranches. The state grazing leases for all but the southern end of the Cerro Colorado range are held by the Marley Cattle Company. While the vicinity of the Cerro Colorado mountains is not presently feeling significant development pressure, the potential exists for the several thousand acres of private ranch land adjacent to and/or near the park to be sold at some point in the future for development purposes. Pima County hopes to keep these presently open lands in their natural state by including them in one of the Sonoran Desert Conservation Plan's Ranch Conservation Areas.

Natural Resources -- The unspoiled quality and significance of the range's natural resources make a strong case for the kind of effective protection that a county mountain park can provide. The range's volcanic geology and picturesque red rocks support a variety of plant and animal species. Plant communities in the mountains and its surrounding area include grasslands at lower elevations, as well as additional grassland and the Madrean evergreen-oak community at higher elevations. The Pima pineapple cactus, a listed endangered plant species, exists in the area and may also occur within the boundaries of the proposed park.

The Cerro Colorados boast an impressive roster of wildlife species, including, as previously noted, mule deer, white-trail deer, javelinas, and coatimundis, as well as cliff-dwelling raptors such as the rarely-seen golden eagle. Special status wildlife species in the area include the spotted jaguar and the masked bob-white quail--both of which are listed endangered species--and the Northern gray hawk, Pale Townsend's big-eared bat and Sonoran desert tortoise, all species of special concern.

The proposed ranch conservation area will also protect a key portion of the area's watershed. The Cerro Colorado's watershed features are of critical importance because they help sustain several nearby riparian areas, including riparian habitat in the nearby Buenos Aires Preserve. Wildlife authorities have noted that this habitat is especially important for migrating neotropical birds.

The range's exceptional viewshed is another of its outstanding natural assets. The view around the Cerro Colorados is literally unblemished for a full 360 degrees, a very rare characteristic for mountains in Eastern Pima County.



John Dell

Cerro Colorado

Linkages to Other Protected Natural Areas -- One of the principal purposes of establishing Cerro Colorado Ranch Conservation Area is that it will facilitate the creation of a perpetually-protected biological connection between the range and the Buenos Aires National Wildlife Refuge, which is located approximately four miles west of the proposed park. Two principal approaches have been preliminarily identified to accomplish this goal. The first approach involves fashioning a protected broad overland link using a combination of State Trust and BLM land. A small quantity of private property within the proposed corridor complicates this project, but its overall potential is strong.

The second approach involves linking the northwestern corner of the park with the northeastern corner of Buenos Aires Refuge by developing a protected biological corridor around the Penitas Wash (Figure 39). Protecting the Penitas Wash and its riparian habitat makes sense as a project unto itself, but using it as a biological corridor between these two units increases its overall utility (the westernmost section of the Champurrado Wash, which flows out of the Sierrita Mountains, is included in the proposed link).

The Sonoran Desert Conservation Concept Plan specifically proposes the creation of the Penitas Wash corridor, and has identified a proposed boundary for the preserve that encompasses a total of 3,183 acres. Of that total, 2,947 acres are State Trust Lands, and the remaining 236 acres are private property.

A linkage between the northern end of the Cerro Colorados and the southern end of the Sierrita Mountains, which are approximately five miles apart, should be considered in the future. Creating a connection using mostly State Trust Lands is a viable possibility. The Ranch Conservation Area proposed for the lands surrounding these ranges could facilitate the creation of this important linkage.

Figure 39

Penitas Wash

- Parcel Base And Streets
- Township And Range Lines
- Section Lines
- Washes
- Administrative Boundaries
- Proposed Park Boundaries
- Trails
- Penitas Wash Area
- Wildlife Corridor Links
- Proposed Mountain Parks
- Riparian Habitat / Wildlife Corridor Link
- Private Lands
- State Trust Lands
- Buenos Aires National Wildlife Refuge

PENITAS WASH:
 State: 2,947 Acres
 Federal: 0 Acres
 Private: 236 Acres

Pinna County Index Map



Index Map Code: 3.1.00000

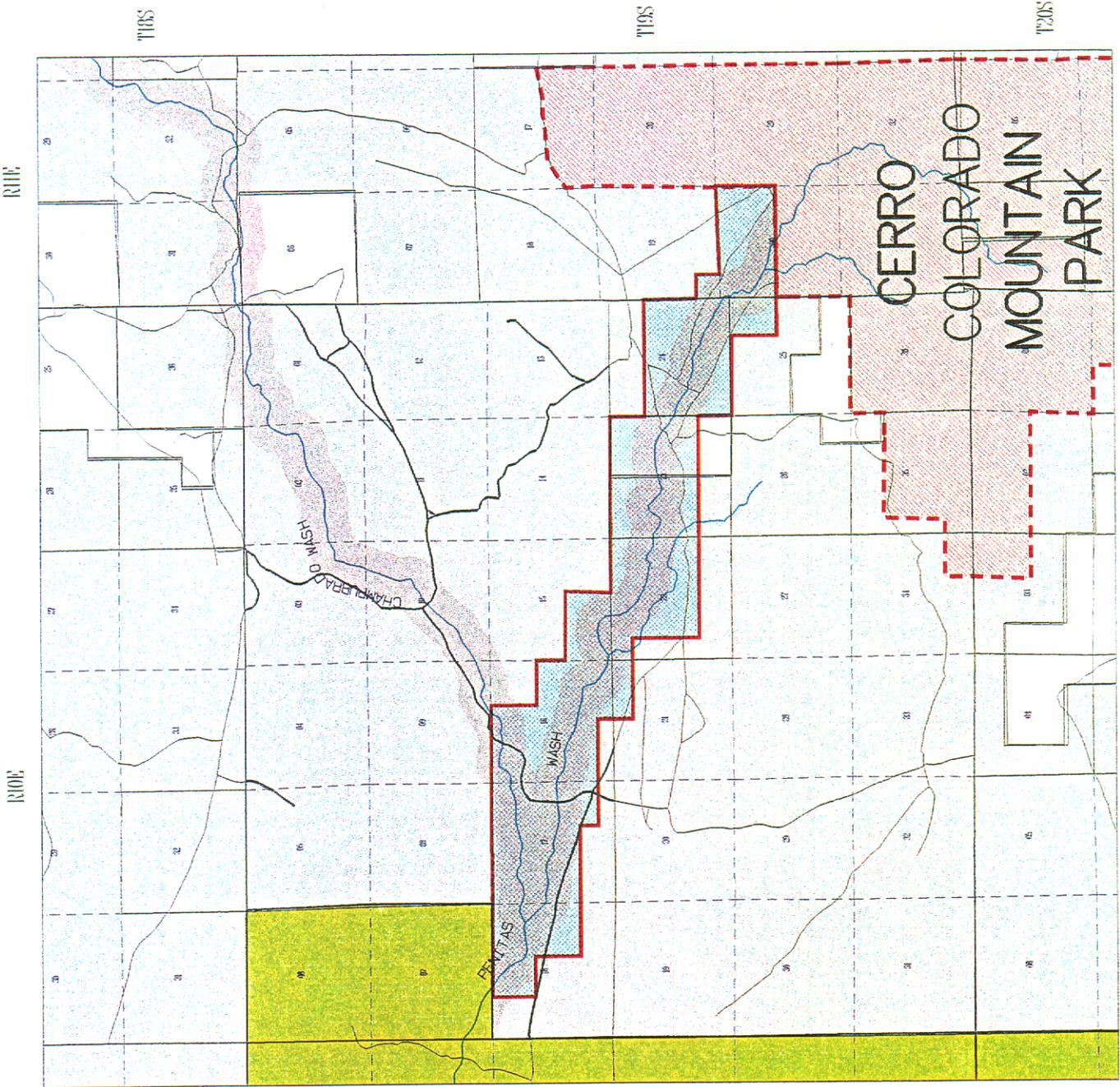
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Applicable Planning Documents

The following planning documents and agreements contain information pertaining to Tucson Mountain Park and/or the area surrounding the park:

- Tucson Mountain Park Phase I Planning Study (1998)
- City of Tucson Comprehensive Plan (1998)
- Saguaro National Park Tucson Mountain District Trails Plan (1997)
- Avra Valley Land Use Study for City of Tucson Property Holdings (1996)
- Pima County Comprehensive Plan (1992)
- Interim CAP Right-of-Way Land Use Policy (1993)
- Cooperative Agreement for the Management of the Tucson Mitigation Corridor (1990)
- Saguaro National Park Statement for Management (1995)
- Saguaro National Monument General Management Plan (1988)
- The Findings of the Pima County Open Space Committee - (1988)

The following planning documents contain information pertaining to the proposed Cerro Colorado Mountain Park and/or the area surrounding the park:

- Buenos Aires National Wildlife Refuge Comprehensive Conservation Plan (due 9/99)
- Eastern Pima County Trail System Master Plan (1996)
- Pima County Comprehensive Plan (1992)
- BLM Phoenix District Resource Management Plan (1988)
- The Findings of the Pima County Open Space Committee - A Report to the Pima County Board of Supervisors (1988)

Mountain Parks, Reserves and Biologically Significant Resource Lands

AVRA VALLEY SUBAREA

Sonoran Desert Conservation Plan

August 2000

Introduction

The Avra Valley subarea area includes the northern extent of the Brawley West watershed north of Mile Wide Road, between the Santa Cruz River and the Tohono O'odham Nation Schuk Toak District. The western boundary of this subarea includes the Silver Bell, Waterman, and Roskrige Mountains, recently declared part of the Ironwood National Monument. The Tucson Mountains encompass the eastern subarea boundary (see Figure 40).

Driving west from Tucson over Gates Pass, seemingly endless vistas stretch across the subarea. The views are timeless and yet, upon closer inspection, development is beginning to creep into the lower elevation areas near Brawley Wash. The eastern flank of the Waterman-Roskrige range and the lands of the Tohono O'odham Nation remain relatively undisturbed.

Looking north from the valley floor, the Silverbell Mountains and the distinctive peak of Ragged Top comes into view. Mining activity is apparent, but does not pose the same visual impact as rapid development from the town of Marana to the east. The subarea changes from open and undeveloped mountain ranges on the west side, to rural homesites in the eastern portion of the Brawley Wash area. The predominant means of development in the subarea has been by lot-splitting and wildcat subdividing.

Saguaro, paloverde and ironwood dominate the Avra Valley landscape. The ironwood tree has served as an enormously important protector of species diversity within the Sonoran Desert. A study led by Dr. Gary Nabhan of the Arizona-Sonora Desert Museum entitled *The Desert Ironwood Primer* establishes the importance of ironwood as a habitat modifying keystone species and nurse plant that has a role in supporting the biodiversity of over 500 Sonoran Desert species, including the endangered cactus ferruginous pygmy-owl. On June 9, 2000, President Clinton issued a proclamation which authorized the creation of the 129,000 acre Ironwood Forest National Monument, covering much of this subarea and extends into Pinal County.

Ranching has been and continues to be an important land use in this valley. The ranchers in this subarea are in support of open space preservation and resource conservation, including preservation of cultural resources on their land. More than 200 sites from the prehistoric Hohokam period of A.D. 600-1450 have been recorded in the region, and two archaeological site districts, the Los Robles Archaeological District and the Cocoraque Butte Archaeological District, have been listed on the National Register of Historic Places.

GAP Status of the Avra Valley Subarea

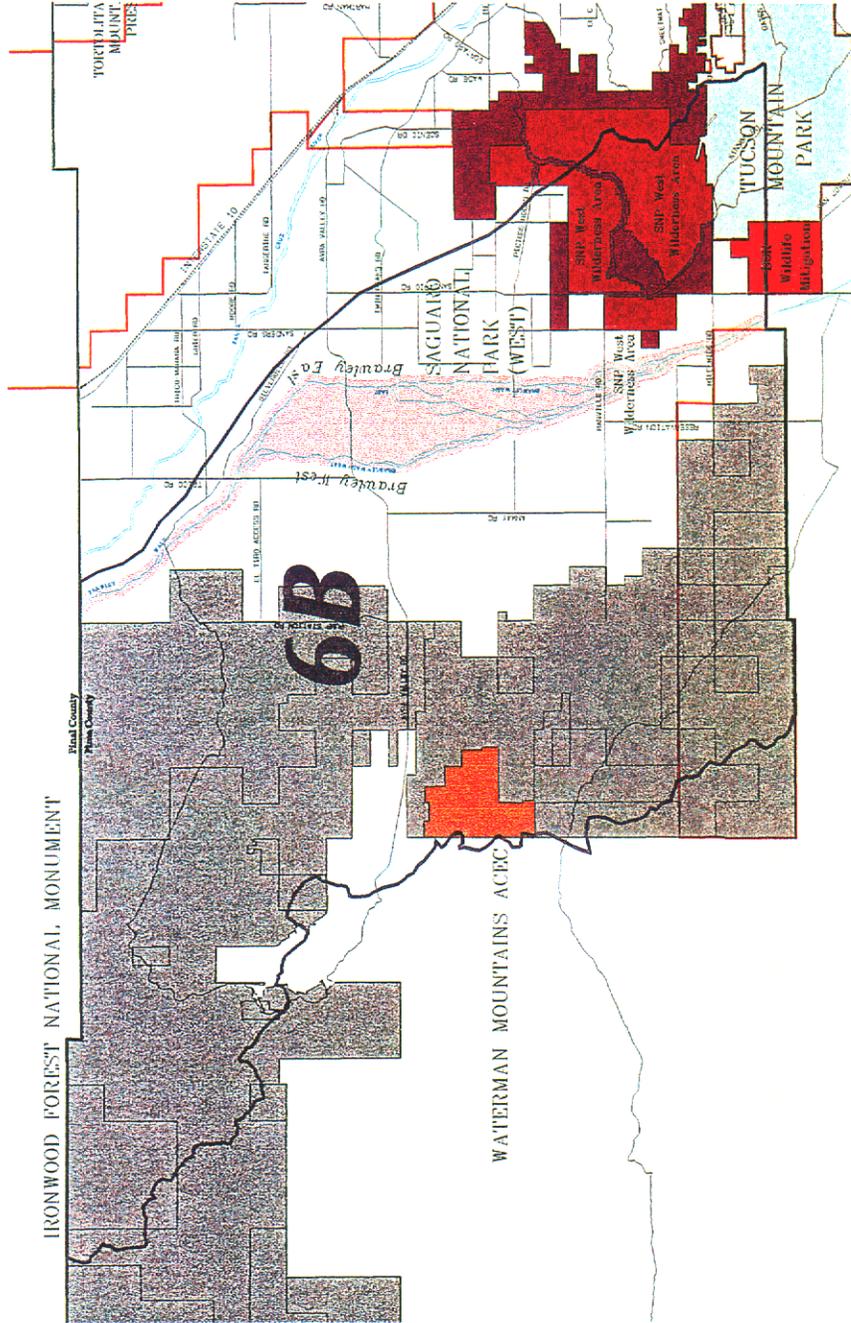
The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the

Figure 40

Avra Valley

SDCP PLANNING AREA 6B

-  Major Streets
-  Major Washes
-  Sub-Area Boundary
-  FWS Pygmy Owl Critical Habitat Units
-  Saguato National Park West
-  Saguato National Park West Wilderness Area
-  Ironwood Forest National Monument
-  Waterman Mountains ACEC
-  Bureau of Reclamation Wildlife Mitigation Corridor
-  Tucson Mountain Park
-  Wildlife Corridor Links



Pima County Index Map



Index Map Scale 1:100,000

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purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 25).

The Avra Valley Subarea has 47,632 acres of protected land, most of which is in the Ironwood National Monument (see Table 25). Reserved lands total 67 percent of the subarea. Lands outside of reserves, (unreserved Status 4 lands), including private, state, and other land total of 73,772 acres.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the multi-species habitat conservation plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team, which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 26 lists the priority vulnerable species.

Vulnerable Biological Features

Habitats most at risk include Critical Habitat for the cactus ferruginous pygmy-owl, habitat for the bighorn sheep, the remaining ironwood forests, riparian and xeroriparian areas, and the area of shallow groundwater east of Silverbell Mine. Private and State Trust Lands adjacent to the existing preserve areas are at risk of being developed at high intensity levels. Table 26 lists priority streams and springs within the subarea.

Potential Stressors

Potential stressors to the Avra Valley subarea are habitat loss, alteration and degradation; habitat fragmentation; conversion of vegetative cover, competition by non-native species, human use and overuse; and the decline in groundwater levels. Current ownership and management within this subarea provides substantial opportunity for conservation.

The U.S. Bureau of Land Management's proposed Resource Management Plan (RMP) requires policies and actions in any mineral lease agreement which are intended to prevent habitat damage to bighorn sheep areas, prevent the animals from abandoning portions of their habitat, prevent impacts of off-road vehicles, and to reduce impacts by mining. The RMP also closes 800 acres in the Ragged Top lambing area to vehicular use.

Existing Stressors

Activities contributing to biological stress are the effects of a history of agricultural use of the valley, groundwater pumping to support agricultural uses, residents and the Tucson Basin; and urbanization in the form of lot-splitting, subdivisions, and the roadways and infrastructure to

Table 25

Existing Reserves in the Avra Valley Subarea

Existing Reserves	Total Acreage	GAP Status					
		Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
Tucson Mountain Park	4,504			x			
Saguaro National Park west Wilderness Area	9,211	x					
Saguaro National Park west	4,220		x				
BOR Wildlife Mitigation Corridor	780			x			
Ironwood National Monument*	128,917			x			
Total Acres of Existing Reserves	147,632						
Total Acres of the Avra Valley Subarea	221,404						

*Acreage includes some land in Pinal County

Table 26: Avra Valley Priority Vulnerable Species, Streams and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Blanco Wash	1 spring location
<i>Lasiurus xanthinus</i> Western yellow bat	Cocio Wash	1 owned by U.S. National Park Service
<i>Lasiurus blossevillii</i> Western red bat		
<i>Leptonycteris curasoae</i> Lesser long-nosed bat		
<i>Macrotis californicus</i> California leaf-nosed bat		
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat		
<i>Aimophila carpalis</i> Rufous-winged sparrow		
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo		
<i>Athene cunicularia</i> Burrowing owl		
<i>Pipilo aberti</i> Abert's towhee		
<i>Vireo belli</i> Bell's vireo		
<i>Chionactis occipitalis klauberi</i> Tucson shovel-nosed snake		
<i>Sonora semiannulata</i> Ground snake		
<i>Echinocactus horzonthalonius var nicholii</i> Nichol's Turks Head cactus		
<i>Tumamoca macedougallii</i> Tumamoc globeberry		

support development. Problems with lot splitting in the valley that may affect biological resources include stressors such as dust, erosion, and runoff problems associated with unpaved roads, increasing groundwater pumping, encroachment into floodplain areas, removal of vegetation cover, damage to and/or removal of xeroriparian vegetation, and the introduction and spread of exotic species. These result in habitat loss and fragmentation, decline in groundwater levels, and competition and predation by invasive species.

The potential for increased mining exists in the Silverbell Mountain area. Increased mining in this area would result in habitat loss, alteration, degradation and fragmentation, and disruption of habitat use patterns by the bighorn sheep.

Ranching

Not until the Gadsden Purchase of 1854 did Avra Valley experience its first significant wave of immigrants who were largely American mining prospectors in search of gold and silver. With the establishment of mines in the Silverbell Mountains, Tucson Mountains, Snyder Hill and Saginaw Hill, and west to the Quijotoa mines, a number of freight and stagecoach lines were created that crossed the Tucson Mountains and opened up the Avra Valley for settlement.

While mining and freighting initiated the commercial development of the Avra Valley, a few others filed homestead claims for agricultural and ranching uses, although the lack of surface water made these ventures much more difficult. Only a few settlers were attracted to the Avra Valley subarea. Where established, the early ranches were typically located at the interface of the mountain ranges and the upper bajada slopes of the valley where wells could be easily drilled. A few early farms were established along the Brawley Wash floodplain where agricultural lands could be easily developed. Although there was no natural water sources, a well could be dug at a fairly shallow depth of 35-50 feet.

Some notable early ranches included the Garcia Ranch established about 1915 at the western margins of the valley. This early claim by Jose Garcia would eventually lead to the establishment of the "Garcia Strip" of the Tohono O'odham Nation established in 1916 that would cross the Avra Valley and essentially divide the Avra from the Altar Valleys.

The Avra Ranch is shown on the 1893 Roskrug map just to the north of the Robles Ranch and south of the Garcia Strip. Later maps show it some miles north at today's intersection of Picture Rocks Road and Sandario Road. Other ranches shown on early maps include the Cocoraque and Agua Blanco ranches.

With the exception of the later Avra Ranch site, the valley's namesake that is now in the middle of the developing Picture Rocks area. However, some 13 ranches many of which include lands from the original homesteads, continue in operation in this subarea, utilizing private lands, 13 State Trust Land grazing leases, 7 BLM leases of various parcels, and 1 State Special Land Use Permit.

Of the private lands in Avra Valley approximately 16,716 acres, or 24 percent, are used for ranching. It should be noted that the City of Tucson agricultural lands purchased from private property owners are included in this total. In addition, 47,674 acres of State Trust Lands and 85,388 acres of BLM land appear to be used for grazing.

Cultural and Historical Resources

The initial occupation of the Avra Valley may date to prehistoric Paleoindian period perhaps as early as 10,000 B.C. that predates the introduction of pottery technology. Paleoindian sites have been recognized by the presence of large, well-made projectile points and other flaked stone tools, found often in association with butchered remains of now-extinct large mammals such as mammoths. It is likely that Clovis people hunted big game animals in or near Avra Valley.

With the extinction of the large Pleistocene mammals, the Paleoindian tradition was eventually followed by a mixed foraging and hunting economy called the Archaic tradition, which dates roughly from 7500 B.C. to about A.D. 300. Few early Archaic sites are known, but there is evidence for increasing population and more intensive use of the Avra Valley in the middle and late Archaic periods.

The Hohokam occupies villages and smaller hamlets from about A.D. 300 to 1450 along the Brawley Wash floodplain and in "dry-farming" settings in non-riverine areas. Following the Hohokam collapse that occurred about A.D. 1450, little is known of the area until the Spanish missionaries and explorers entered the region in the 1690s and encountered Piman or Tohono O'odham peoples who are likely to be the descendants of the Hohokam. The region was known during Spanish Colonial and Mexican periods as "Pimeria Alta".

With the acquisition of this region by the United States following the 1854 Gadsden Purchase, and the military presence after 1870, some of the first Americans to enter the area were prospective miners in search of gold and silver. Substantial settlement of the Avra Valley with miners, homesteaders, and ranchers began in earnest in the 1870s and opened the Avra Valley for commercial development..

Recreational Resources

Saguaro National Park and Tucson Mountain Park are the primary recreational opportunities within the subarea. These parks are bisected by Picture Rocks, Sandario, and Kinney Roads that carry high volumes of traffic.

Recreational opportunities within Saguaro National Park include resource interpretation, wildlife viewing, bird watching, hiking, and equestrian use on designated trails. Hunting is prohibited in Saguaro National Park.

Tucson Mountain Park contains developed day-use picnic areas, camping, scenic viewing opportunities, and 26 miles of trails for hiking, bicycling, and equestrian use on designated trails.

The Arizona Department of Game and Fish has implemented a special permit/tag system for hunting in Tucson Mountain Park to reduce user conflict and ensure hunter compliance. Archery hunting is permitted for predominantly mule deer and javalina in accordance with Arizona Game and Fish regulations.

In addition, the Avra Valley Subarea encompasses the Arizona Game and Fish Management Area 37A. In terms of big game, javalina and mule deer may be hunted within this management area. Quail, rabbit and dove are commonly hunted small game species.

Several planned trails identified in the Eastern Pima County Trail System Master Plan are located in the Avra Valley and include:

- Central Arizona Project (Trail #3)-access from Pinal County line to the Pasqua Yaqui Indian Reservation
- Brawley Wash (Trail #11)-from Los Robles Wash to Black Wash
- Sandario Road (Trail #119)-links Avra Valley Road to Castle Drive
- Avra Valley Road (Trail #16)- access from Sandario Road to the Santa Cruz River

Existing Policies

Tucson Mountain Park occurs within three subareas- the Middle Santa Cruz, and the Altar and Avra Valleys. Policies for Tucson Mountain Park are the same within each subarea report. However, potential policies may differ depending on the park's resources within that particular subarea.

Tucson Mountain Park. Tucson Mountain Park is the oldest Pima County Park and many of the policies that now apply to other parks were originally established for TMP under Arizona Administrative Code: Title 12 Chapter 12.

As duly authorized by State Statute, the Parks and Recreation Commission has the authority under ARS 11-931 to establish policies applicable to all County Parks.

The following codes are applicable to Tucson Mountain Park:

- 12-12-01 Domestic Animals
- 12-12-02 Intoxicants
- 12-12-03 User Fees
- 12-12-04 Use and Occupancy of County Parks
- 12-12-05 Violation and Penalty

Other Reserves: For a complete listing of Public Use and Resource Management Policies in other reserves of the subarea, please consult Tables 27 and 28 within this subarea report.

Table 27: Avra Valley Public Use Policies

Managing Entity	Reserve Name	Public Use Policies												Comments				
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle	Kiing Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Plinking	Shooting Range		Fishing	Swimming	Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	R	R	R	R	NA	R	R	Consult Appropriate Agency
USDI Bureau of Reclamation	BOR Wildlife Corridor	Y	Y	Y	Y	NA	N	N	N	N	N	N	N	N	NA	N	NA	
National Park Service	Saguaro National Park (excluding wilderness area)	Y	N	R	R	R	R	R	N	N	N	N	N	NA	NA	R	Y	Fee Area, Backcountry permit required for camping in E. Unit
Pima County	Tucson Mountain Park	Y	Y	Y	Y	N	N	N	Y	N	N	Y	NA	NA	N	N	N	
BLM	Ironwood National Monument	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y		NA	Y	Y	Y	Change Pending Consult BLM
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	Y	NA	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y=Yes
R = Restrictions
P = Permit Required
N=No
NA=Not Applicable

Table 28: Avra Valley Resource Management

Managing Entity	Reserve Name	Resource Management Policies														Comments					
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Prog.	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Prog.	Refuse Removal Program	Cultural/Hist. Mgmt. Prog.
Varies	Wilderness Areas	R	N	P	N	Y	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	Y	
USDI Bureau of Reclamation	BOR Wildlife Corridor	N	Y	P	P	N	N	N	Y	Y	N	N	N	N	Y	N	N	N	N	Y	
National Park Service	Saguaro National Park (excluding wilderness area)	N	N	N	N	N	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	
Pima County	Tucson Mountain Park	N	Y	P	P	N	N	N	Y	Y	N	N	N	Y	Y	Y	Y	N	Y	Y	
BLM	Ironwood National Monument	N	P	P	P	Y	R	N	N	Y	Y	N	N	N	Y	Y	N	Y	N	Y	Management subject to change
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	Y	P	P	Y	Y	Y	Y	Y	Y	Y	

Y=Yes
 R = Restrictions
 P = Permit Required
 N=No
 NA=Not Applicable

Existing Reserves

Ironwood National Monument

Background--The Ironwood species, which can live to be over 800 years old, has served as an important protector of species diversity within the Sonoran Desert. The Ironwood National Monument honors this species for its role in upholding the ecosystem, and the monument achieves practical conservation goals that are necessary to promote the recovery of the endangered pygmy-owl.

Prior studies have established the importance of cultural resources within the area. Bedrock outcrops and volcanic hills in the Ragged Top, Pan Quemado, and Silverbell mountains are unusual for the number of petroglyph or rock art sites that have been recorded. There is wide variation in the number and complexity of petroglyph sites, ranging from a handful of simple elements to hundreds of individual petroglyph elements, some of which are very complex.

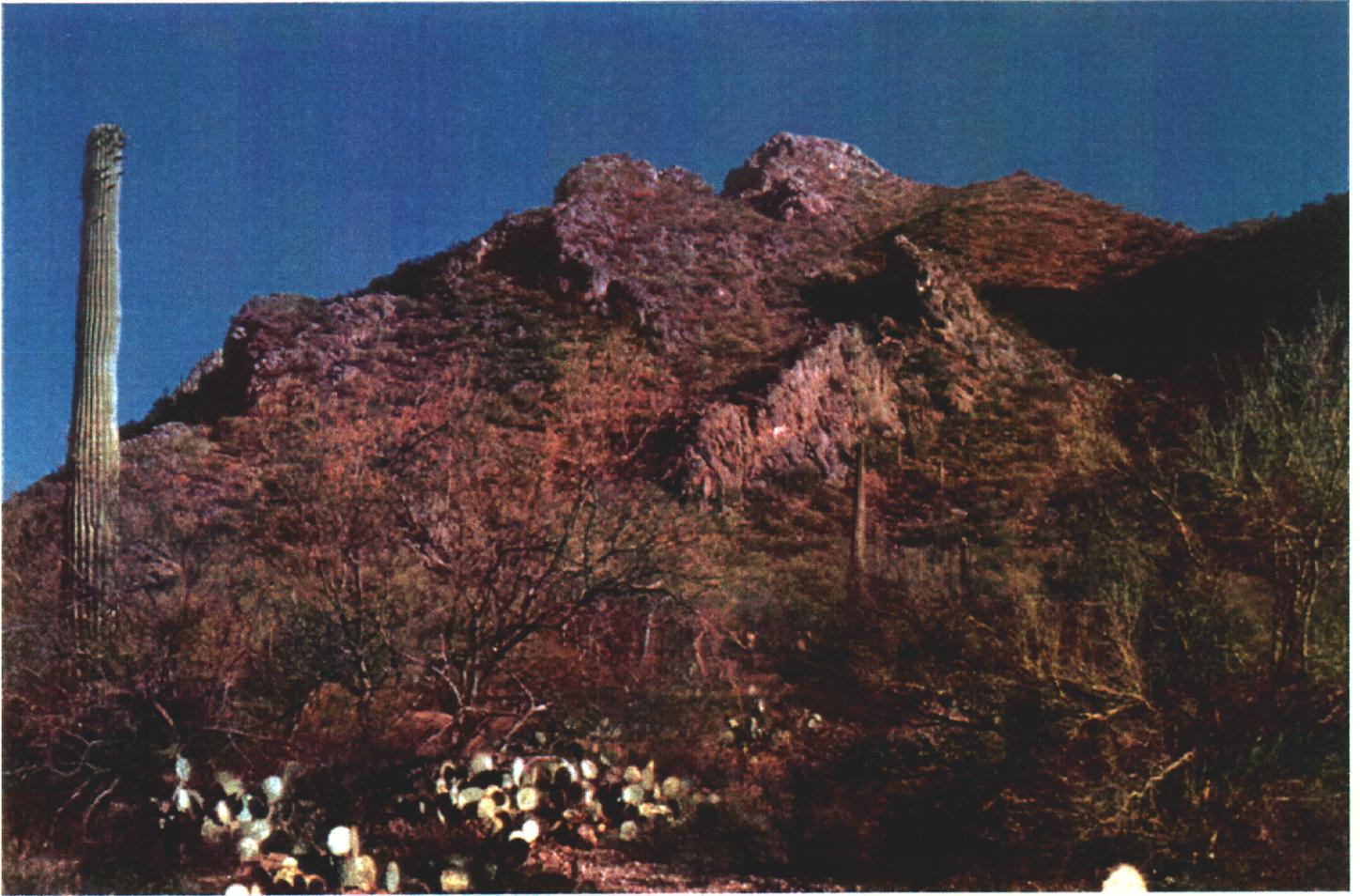
At the south end of this region of prehistoric settlement lies Cocoraque Butte, which is listed on the National Register. This butte and its surrounding desert floor exhibits an extensive Hohokam village and numerous rock art panels that are exceptional for their complexity of design and the number of elements. Like many rock art sites, Cocoraque Butte is considered to be a traditional cultural place by the Tohono O'odham and Hopi Indian tribes.

More recently, a study led by Dr. Gary Nabhan of the Arizona-Sonora Desert Museum entitled *Desert Ironwood Primer* established that within the Sonoran Desert "the Ragged Top site [in the Silverbell Mountains] ... contributed the highest levels of species richness [of the study], with six of the ten plots having the highest levels within the entire region."

The Ragged Top and Cocoraque Rock areas, discussed in this paper, are identified by Dr. Nabhan as priorities for new protection and for strengthened conservation management, since "within the region as a whole, the [Ragged Top and Cocoraque sites] contribute the highest values of significance to biodiversity conservation."

The *Desert Ironwood Primer*, a binational research effort, is the first study that takes a comprehensive view of Ironwood habitats in both the United States and Mexico, evaluating the ecological and cultural resources supported by the ancient ironwood tree. Compared to Mexico, the United States offers limited protection to this important species.

Cultural Resources--Portions of this area of the Avra Valley located to the west of the Los Robles and Brawley washes in the upper bajada and foothills of the Roskruge and Silverbell mountains have been surveyed for cultural resources. The region exhibits extensive systems of prehistoric settlement consisting of villages with public architecture, hamlets, farmsteads, agricultural fields, and a variety of specialized activity areas including rock art sites, reservoirs, quarry sites, resource processing sites, and hillside "trincheras" sites. More than 200 sites



John Dell

Ironwood National Monument

from the predominant prehistoric Hohokam period of A.D. 600-1450 have been recorded in the region.

At the north end of this prehistoric system is the Cerro Prieto Site, located in Pinal County just north of the Pima County line. Cerro Prieto dominates the landscape in this region rising some 700 feet from the valley floor and was clearly an important focal location for habitation and perhaps as a defensive refuge. This is a large and complex hillside "trincheras" village with more than 250 masonry rooms and numerous stone compounds, terraces, walls, and other features. Overall, the features at Cerro Prieto suggest a large, thriving early Classic period hillside settlement. Important questions remain to be addressed about its function in the Los Robles community as well as its role in regional cultural dynamics that extend from central Arizona to Sonora, Mexico.

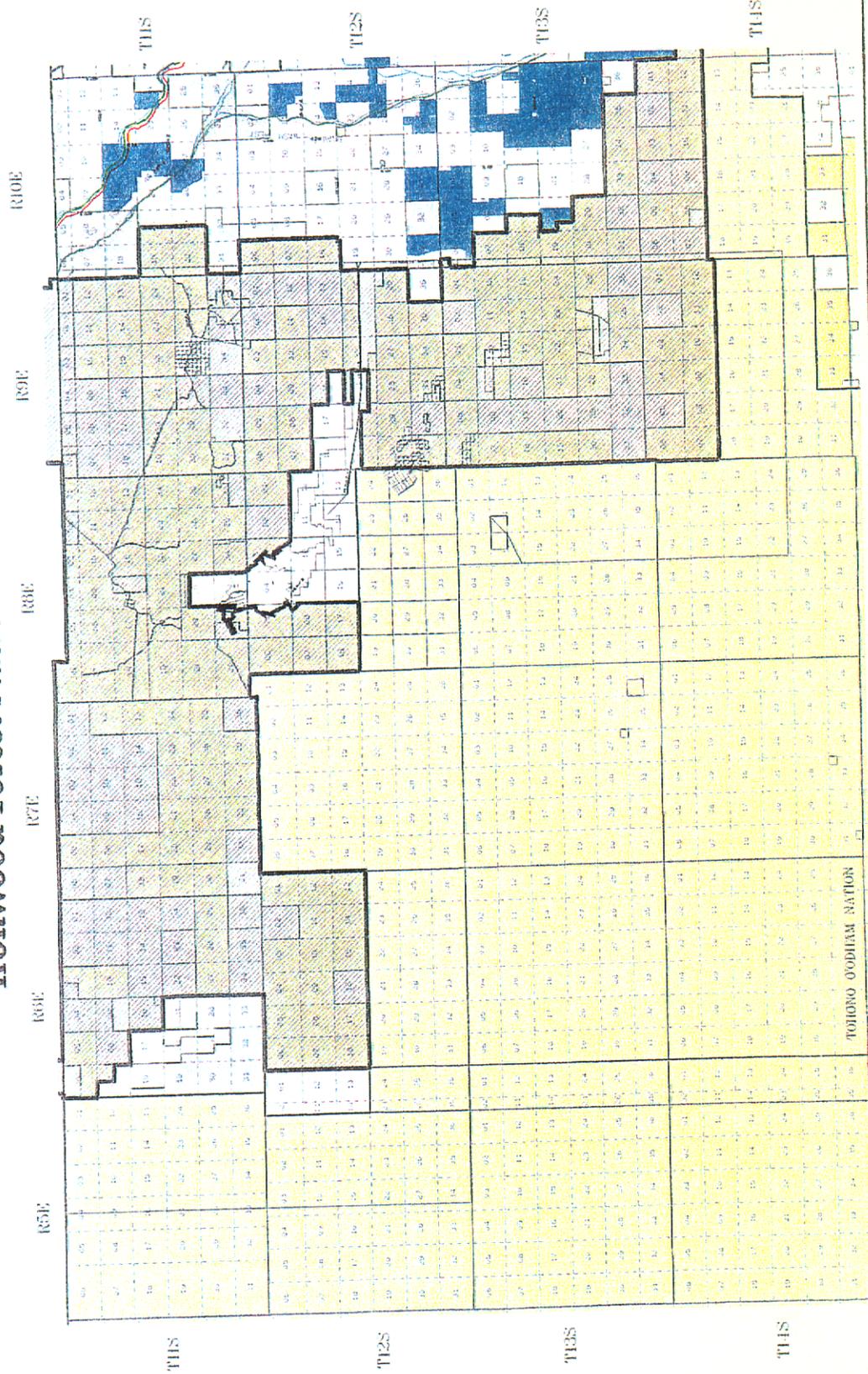
South from Cerro Prieto in Pima County, is another significant but very different village site known as the Robles Platform Mound Community. This site appears to have been contemporaneous with the Cerro Prieto trincheras, occupied roughly from A.D. 1100-1300. Also a focal occupation site, the site is dominated by a rectangular, constructed earthen mound some 6-8 feet higher than the natural desert floor. Although no walls are visible, it is likely that there are buried adobe walls and pithouses present that define a substantial occupation during the Hohokam Classic period. Bedrock outcrops and volcanic hills in the Ragged Top, Pan Quemado, and Silverbell mountains are unusual for the number of petroglyph or rock art sites that have been recorded. There is a wide range of variation in the number and complexity of petroglyph site ranging from a handful of simple elements to hundreds of individual petroglyph elements, some of which are very complex. At the south end of this region of prehistoric settlement lies Cocoraque Butte, which is listed on the National Register. This butte and its surrounding desert floor exhibits an extensive Hohokam village and numerous rock art panels that are exceptional for their complexity of design and the number of elements. Like many rock art sites, Cocoraque Butte is considered to be a traditional cultural place by the Tohono O'odham and Hopi Indian tribes.

The western Avra Valley exhibits various elements of an extensive and complex prehistoric Hohokam community considered to be within the ancestral territory of the Tohono O'odham and certain Hopi clans. This region from the west bank of Los Robles Wash to the foothills of the Silverbell and Roskrige mountains retains significant cultural resource values and defines an intact cultural landscape created and used by the Hohokam during a time of apparent social, organizational and ideological changes that resulted in profound changes to this culture in southern Arizona.

Existing Conditions--The Ironwood National Monument was established by President William Clinton on June 9, 2000 (Figure 41). The monument contains objects of scientific interest throughout its desert environment. Ironwood is the dominant nurse plant in the region, with the Silverbell Mountains supporting the highest density of trees in the region. The Ironwood-bursage community in the Silverbell Mountains is associated with more than 674 species. The monument is home to federally listed threatened and endangered species, including the

Figure 42

Ironwood Forest National Monument



- Bureau Of Land Management (BLM)
- Private Lands
- State Trust Lands
- Tucson Water Land
- Tohono O'odham Nation
- Parcel Base And Streets
- Township And Range Lines
- Section Lines
- Washes
- Trails
- Administrative Boundaries
- Congressional Districts
- Ironwood Forest NM Boundary
- Wildlife Corridor Links

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

TECHNICAL SERVICES

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Scale 1:65,000

PIMA COUNTY ARIZONA



Pima County Index Map

Map prepared by the Pima County Department of Transportation, Technical Services, under contract to the Pima County Department of Transportation.

Nichol's Turks head cactus, and the lesser long-nosed bat, and contains historic and potential habitat for the endangered cactus ferruginous pygmy owl. The bighorn sheep population in this area may be the last viable population in the Tucson basin.

As previously mentioned, the Ironwood Monument was created by presidential proclamation. The monument consists of federal land and interests within the boundaries and are withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition. All motorized and mechanized vehicle use off road is prohibited.

The monument is managed by the U.S. Bureau of Land Management (BLM).

Tucson Mountain Park

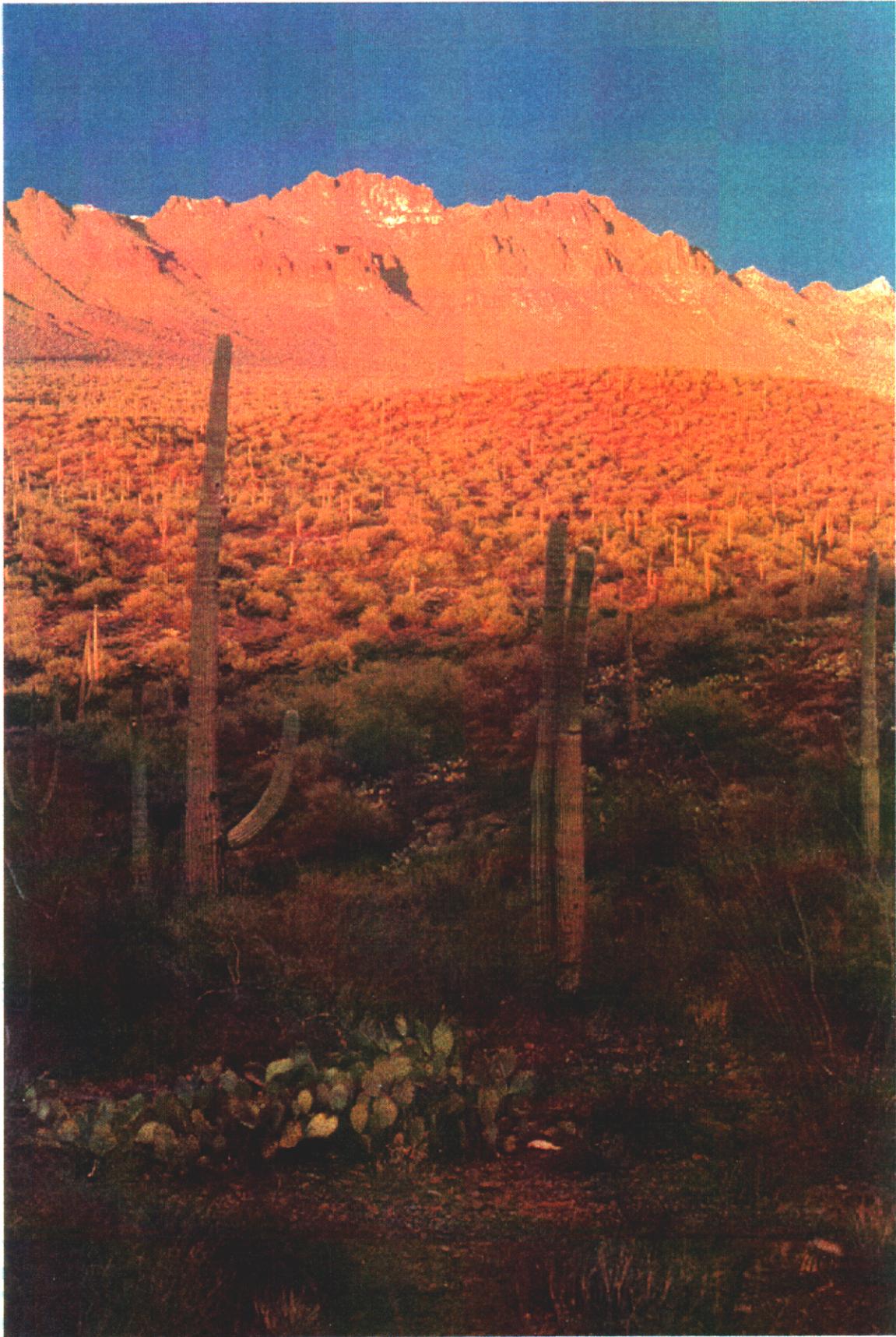
The Tucson Mountain Park (TMP) is an 18,422 acres reserve located on the eastern side of Avra Valley. TMP is actually contained within the boundaries of three subareas defined by the Sonoran Desert Conservation Plan; Avra Valley, Altar Valley and Middle Santa Cruz. A discussion of the reserve from all three subareas follows.

The Tucson Mountain Park is bounded to the north by the 24,034 acre Saguaro National Park (Tucson Mountain District). The Park ties into the Avra Valley Subarea and provides a vital reserve for a number of wildlife species. Wildlife travels between the Waterman-Roskruge and Silverbell Mountains on the western side of this subarea and the Tucson Mountains to the east by way of the Brawley Wash and other biological corridors.

The population of Avra Valley is growing rapidly, and as a result, TMP is increasingly bordered by development. One purpose of the Bureau of Reclamation Wildlife Mitigation Corridor located on the western side of the park is to provide wildlife species with a way to access the valley floor and the mountains beyond from the Tucson Mountain Park.

Bureau of Reclamation (BOR) Wildlife Mitigation Corridor

In addition to the acreage within Tucson Mountain Park that Pima County owns in fee, the County also manages an additional 2,514 acres immediately adjacent to the western boundary of the park owned by the United States Bureau of Reclamation (BOR) as a protected, access-restricted part of the park. This holding, called the BOR Tucson Mitigation Corridor, was established in 1990 to help mitigate the impact of the Central Arizona Project canal on the area's natural wildlife movement corridors between Tucson Mountain Park and natural open space located a short distance to the west, including Brawley Wash, the Schuk Toak District of the Tohono O'odham Nation, and the Roskruge and Waterman Mountains. The manner in which the corridor is managed is set forth in a formal agreement executed between the Bureau of Reclamation and Pima County.



John Dell

Tucson Mountain Park

MP20

Figure 43



Gale Bundrick

**U.S. Bureau of Reclamation
Wildlife Mitifation Corridor**

Applicable Planning Documents

The following planning documents and agreements contain information pertaining to the Avra Valley subarea:

- Tucson Mountain Park Phase I Planning Study (1998)
- City of Tucson Comprehensive Plan (1998)
- Pima County Comprehensive Plan (1992)
- Saguaro National Park Tucson Mountain District Trails Plan (1997)
- Avra Valley Land Use Study for City of Tucson Property Holdings (1996)
- Pima County Comprehensive Plan (1992)
- Interim CAP Right-of-Way Land Use Policy (1993)
- Cooperative Agreement for the Management of the Tucson Mitigation Corridor (1990)
- Saguaro National Park Statement for Management (1995)
- Saguaro National Monument General Management Plan (1988)
- The Findings of the Pima County Open Space Committee (1988)
- Eastern Pima County Trail System Master Plan (1992)
- Open Space Bond Acquisition Master Plan (2000)
- Phoenix Resource Management Plan, draft (U.S. BLM)

Mountain Parks, Reserves and Biologically Significant Resource Lands

WESTERN PIMA COUNTY SUBAREA

Sonoran Desert Conservation Plan

August 2000

Introduction

The Western Pima County Subarea encompasses an area of approximately 1,082,282 acres comprised almost entirely of Federal lands. It is the largest subarea, except for subarea 7, the Tohono O'odham Nation, which comprises some 2,354,910 acres. The subarea is bordered on east by the Tohono O'odham Nation and on the south by Mexico. Maricopa and Yuma Counties border the north and west boundaries. Three reserves, the Organ Pipe Cactus National Monument, the Cabeza Prieta National Wildlife Refuge, and the Barry M. Goldwater Range, total almost 775,000 acres within western Pima County (see Figure 45). These areas adjoin a large expanse of land managed by the U.S. Bureau of Land Management that surrounds the towns of Ajo and Why.

Private land in the subarea is limited to Ajo, Why, and Lukeville. Development is limited and the landscape is characterized by rugged terrain with a series of northwest-southeast mountain ranges separated by broad valleys. Elevations are low, ranging from 640 to 4542 feet above sea level.

Organ Pipe Cactus National Monument (OPCNM) is a 330,000 acre reserve managed by the U.S. Department of Interior, National Park Service. State highway 85 remains the only paved road through the park. Two internal loop roads provide an alternate means of visiting portions of the monument. The vast majority of the reserve is designated as a federal wilderness area with access restrictions.

East of OPCNM is the Cabeza Prieta National Wildlife Refuge (NWR). This vast 860,000-acre refuge has limited public access. Although water is scarce, the refuge does have numerous wildlife species, such as the Sonoran pronghorn, dependent on this arid reserve for survival. Cabeza Prieta NWR is managed by the U.S. Department of Interior, Fish and Wildlife Service. A permit is required to enter the refuge. Road access within the Refuge is limited to two primitive non-surfaced roads that require four-wheel drive. Management does not encourage the use of these roads.

Connecting with the Cabeza Prieta National Wildlife Refuge on two fronts is the much larger Barry M. Goldwater Military Range; this 2,700,000-acre Air force Gunnery Range includes air space over portions of the Wildlife Refuge.

The Sonoran Desert National Park Friends, located in Tucson, Arizona, has initiated a proposal to combine Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge and the Goldwater Gunnery Range into one large "Sonoran Desert National Park" managed by the National Park Service.

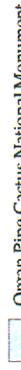
GAP Status of Western Pima County

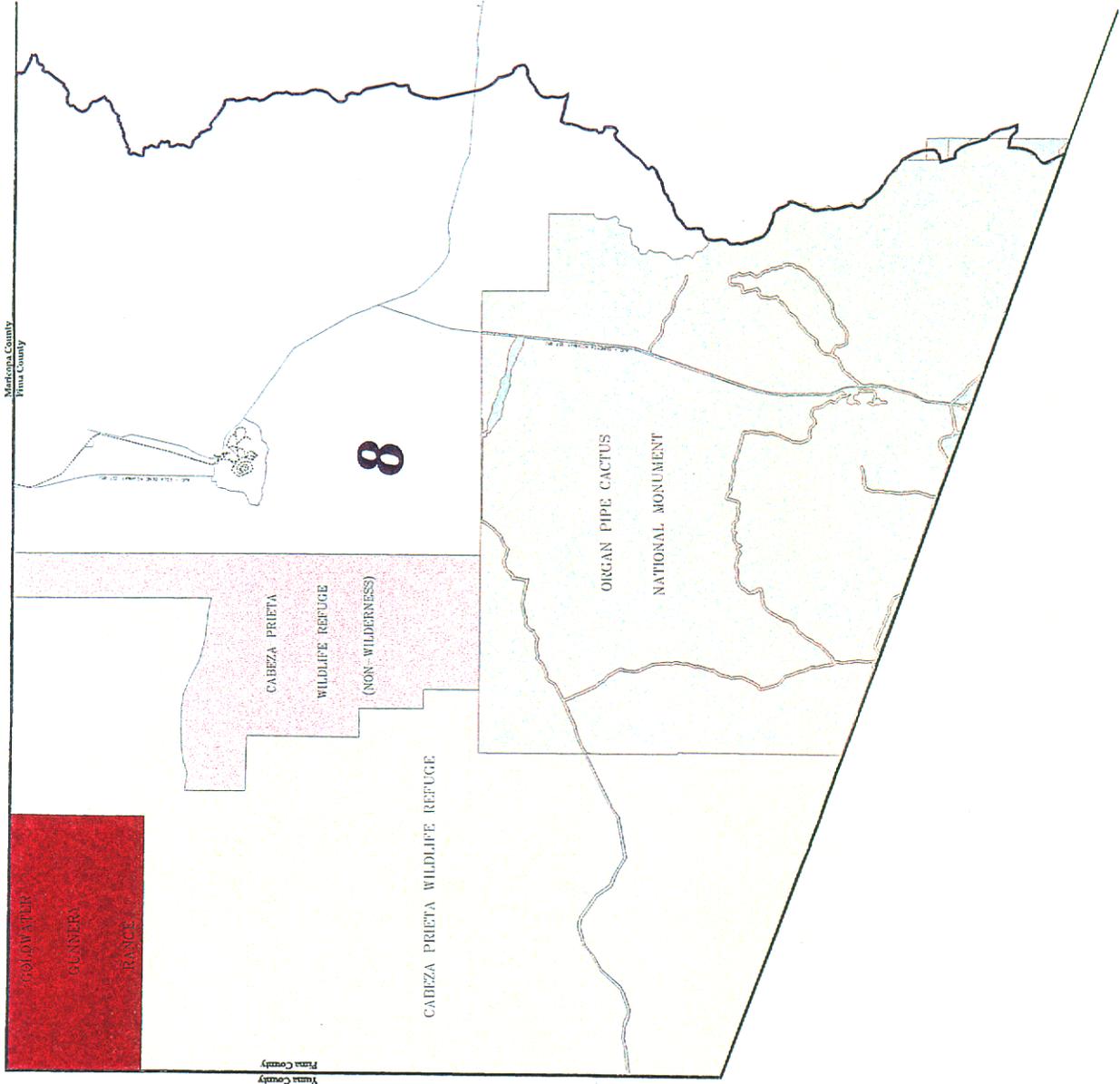
The National Gap Analysis Program (GAP) was used as a model to classify the degree of management commitment to biodiversity maintenance for the various public lands within each

Figure 45

Western Pima County

SDCP PLANNING AREA 8

-  Major Streets
-  Major Washes
-  Sub-Area Boundary
-  Cabeza Prieta Wildlife Refuge
-  Cabeza Prieta Wildlife Refuge Wilderness Area
-  Organ Pipe Cactus National Monument
-  Organ Pipe Cactus National Monument Wilderness Area
-  Goldwater Gunnery Range



Pima County Index Map



Index Map Code: 11.00000



Scale: 1:70,000

The information presented on this document is the result of a review of available data and is intended to provide a general overview of the planning area. It is not intended to be used as a legal document. The information is subject to change without notice. The information is subject to the Department of Transportation Technical Services Division's User Notification Agreement.



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 307 North Alamo Avenue, 4th Floor
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 Web: www.pima.gov



subarea. The GAP system uses a scale from 1 through 4, with a GAP status of 1 representing the highest, most permanent level of biodiversity conservation, and a GAP status of 4 represents the lowest level of conservation commitment or an unknown GAP status. For the purpose of this report, all land considered a reserve has a GAP status of 1 through 3 (refer to Table 29).

Western Pima County has 774,769 acres of protected land, including lands managed by the U.S. Fish and Wildlife Service, the U.S. National Park Service, and the U.S. Department of Defense (see Table 29). Land outside of reserves (unreserved Status 4 land), including private, state, or other land, total of 307,513 acres. In Subarea 8, 72 percent of the land is in Status 3b or higher.

Priority Vulnerable Species

Priority vulnerable species are those species that have been recommended for further consideration and analyses as potentially covered under the multi-species habitat conservation plan (MSHCP). In order to arrive at this recommendation, a review process was undertaken by the Sonoran Desert Conservation Plan's Science and Technical Advisory Team, which screened a larger list of vulnerable species. The draft report, *Priority Vulnerable Species* (June 2000), explains the methods and processes behind the recommended 56 potentially covered species. Table 30 lists the priority vulnerable species.

Vulnerable Biological Features

Important features in this subarea are the Quitobaquito Springs area, abandoned mines and other roosting areas for bats, and lower elevation desert scrub communities. Table 30 lists priority streams and springs found in the subarea.

Potential Stressors

Potential stressors to biological resources in western Pima County include habitat alteration and degradation, habitat fragmentation, human use and overuse, decline in ground water levels, and competition and predation by invasive species.

The community of Ajo has the potential to increase in size. Opportunities exist to transfer public (BLM) lands to private ownership. This would allow the conversion of native vegetation lands to higher intensity urbanized areas dependent on groundwater. This is a particular concern in areas adjacent to existing reserves.

The reopening of the New Cornelia mine, near Ajo, is not expected to impact land areas that are undisturbed. Increased groundwater pumping, water pollution, and atmospheric deposition are stressors to the surrounding biological community.

Table 29: Reserves of Western Pima County Subarea 8

Western Pima County			GAP Status					
Managing Entity	Existing Reserves	Acreage	Status 1a	Status 1b	Status 2	Status 3a	Status 3b	Status 4
U.S. Fish and Wildlife Service	Cabeza Prieta National Wildlife Refuge	77,003		x				
	Cabeza Prieta National Wildlife Refuge Wilderness	322,216	x					
U.S. National Park Service	Organ Pipe Cactus National Monument	13,994			x			
	Organ Pipe Cactus National Monument Wilderness	317,278	x					
U.S. Air Force	Barry M. Goldwater Range	44,278					x	
Total Reserve Acres		774,769						
Total Acres of the Western Pima County Subarea		1,082,282						

Table 30: Western Pima County Priority Vulnerable Species, Streams, and Springs

Priority Vulnerable Species	Priority Streams	Springs
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	Quitobaquito Pond	<p><i>7 spring locations</i></p> <p>6 owned by the U.S. National Park Service</p>
<p><i>Lasiurus blossevillii</i></p> <p>Western red bat</p>	Quitobaquito Springs	
<i>Leptonycteris curasoae</i> Lesser long-nosed bat		<p>1 owned by the U.S. Fish and Wildlife Service</p>
<i>Macrotis californicus</i> California leaf-nosed bat		
<i>Plecotus townsendii</i> Pale Townsend's big-eared bat		
<i>Peromyscus merriami</i> Merriam's mouse		
<i>Lasiurus xanthinus</i> Western yellow bat		
<i>Aimophila carpalis</i> Rufous-winged sparrow		
<i>Athene cunicularia</i> Burrowing owl		
<i>Pipilo aberti</i> Abert's towhee		
<i>Glaucidium brasilianum cactorum</i> Cactus ferruginous pygmy-owl		
<i>Chionactis palurostris organica</i> Organ Pipe shovel-nosed snake		
<i>Cnemidophorus burti xanthonotus</i> Redback whiptail		
<i>Sonorella sp.</i> Talus snail		
<i>Tumamoca macdougalii</i> Tumamoc globeberry		
<i>Echinomastus erectocentrus acunensis</i> Acuna cactus		

Existing Stressors

Existing stressors in this area are the effects of large and small-scale mineral extraction, livestock grazing, increasing tourism and recreational use of the reserves, and groundwater pumping to support agriculture uses directly south in Mexico.

Long-term camping and RV use in BLM lands near Ajo have resulted in moderate to severe habitat loss, alteration and degradation in an area that is habitat for Sonoran pronghorn and other wildlife. Often vegetation is cut down or damaged, soils compacted, sewage is disposed of, and areas are left with little vegetative cover.

Policies

For a complete listing of Public Use and Resource Policies for reserves in this subarea, please consult Tables 31 and 32 within this subarea report.

Table 31: Western Pima County Public Use Policies

Managing Entity	Reserve Name	Public Use Policies														Comments		
		Hiking	Off-Trail Hiking	Horse Back Riding	Mountain Bicycle Riding	Access Permits	Overnight Parking	Overnight Camping	Camp Fires	Firearms Hunting	Archery Hunting	Off-Range Plinking	Shooting Range	Fishing	Swimming		Dogs On Leash	Rock Climbing/Rappelling
Varies	Wilderness Areas	Y	R	R	R	NA	Y	R	R	R	N	N	R	R	NA	R	R	Consult Appropriate Agency
U.S. Bureau of Land Management	Unreserved BLM	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
National Park Service	Organ Pipe Cactus National Monument (excluding wilderness area)	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	NA	Y	Y	Fee Area
U.S. Fish and Wildlife Service	Cabeza Prieta National Wildlife Refuge (excluding wilderness area)	Y	R	Y	Y	Y	Y	Y	R	R	R	N	N	NA	Y	Y	Y	Access Permit Required
Department of Defense	Barry M. Goldwater Range	Y	Y	R	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA	NA	NA	Access Permit Required, not accessible from Pima County
State of Arizona	State Trust Lands	Y	Y	Y	Y	Y	P	P	Y	Y	Y	NA	Y	Y	Y	Y	Y	Recreational permit required to enter for recreation

Y = Yes
 R = Restrictions
 P = Permit Required
 N = No
 NA = Not Applicable

Table 32: Western Pima County Resource Policies

Managing Entity	Reserve Name	Resource Management Policies														Comments					
		Fuel Wood Harvesting	Reptile Collecting	Mineral Collecting	Plant Collecting	Grazing	Mining	Commercial Use	OHV Use	Wildfire Suppression	Controlled burns	Pesticide Mgmt. Program	Vegetation Control Program	Landfills	Sewage Treatment		Groundwater Pumping	Surface Water Diversion	Livestock Mgmt. Program	Refuse Removal Program	Cultural/Hist. Mgmt. Program
Varies	Wilderness Areas	R	N	P	N	Y	N	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	
U.S. Bureau of Land Management	Unreserved BLM	P	Y	Y	Y	P	P	P	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
National Park Service	Organ Pipe Cactus National Monument (excluding wilderness area)	N	N	N	N	N	N	P	N	Y	Y	Y	N	N	Y	Y	NA	Y	Y	Y	
U.S. Fish and Wildlife Service	Cabeza Prieta National Wildlife Refuge (excluding wilderness area)	N	P	P	P	N	N	N	R	Y	Y	N	N	N	Y	Y	NA	Y	Y	Y	
Department of Defense	Barry M. Goldwater Range	N	P	P	P	N	N	N	R	Y	N	N	N	N	Y	Y	NA	Y	Y	Y	No access allowed in the Pima County section of the Range.
State of Arizona	State Trust Land	P	Y	P	P	P	P	P	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Y = Yes
R = Restrictions
P = Permit Required
N = No
NA = Not Applicable

This chart contains the most accurate information available at the time of printing. For current information, please contact the reserve management.

Existing Reserves

Barry M. Goldwater Range

The BMGR is a military range that occupies 2,668,100 acres in southwestern Arizona. The range was established through an Act of Congress, September 5, 1941. BMGR has served many functions since its establishment and continues to function as one of the nation's most productive reservations for teaching military air crews how to fly, fight, and survive in aerial combat.

44,278 acres of the BMGR are within Pima County. The area of BMGR in that falls within the County is part of the South Tactical Range (S-TAC), where air to ground bombing is practiced. Public access to S-TAC is forbidden. The U.S. Fish and Wildlife Service, as well as many conservation groups, have voiced concern about the impact Air Force training activities have on endangered Sonoran pronghorn, bighorn sheep, and other wildlife and plant communities.

Cabeza Prieta National Wildlife Refuge

Background-- The Cabeza Prieta National Wildlife Refuge is a 860,010 reserve straddling Yuma and Pima Counties. The refuge was established in 1939 for the conservation and development of natural wildlife and forage resources. In 1990, Congress designated 803,418 acres of the refuge as a wilderness area.

The Cabeza Prieta National Wildlife Refuge is the largest refuge administered by the U.S. Fish and Wildlife Service and the largest wilderness area managed by any entity in Arizona. The refuge is surrounded by the Barry M. Goldwater Range to the north, Organ Pipe Cactus National Monument to the west, and to the south by some of the least-populated country in northwestern Mexico. The establishment of the Cabeza Prieta Game Range and the Kofa Game Range in 1939 was prompted by the Arizona Game Protective Association, the Boy Scouts of America, and a number of individuals to save the desert bighorn sheep from extinction. At that time, the bighorn sheep population on the refuge was estimated at 90. Today, the number has increased to approximately 500.

Biological Resources--The Cabeza Prieta refuge has mountain ranges that rise well above the desert floor. Plants and animal species vary greatly with altitude and the additional smaller microclimates. The refuge plays host to a variety of mammals, including the bighorn sheep, and the endangered Sonoran pronghorn and lesser long-nosed bat. The refuge also provides habitat for reptiles such as the red-backed whiptail, Gila monster, Sonoran desert tortoise, and six species of rattlesnake. Over 394 species of plants have been identified on the refuge, including the elephant tree (*Bursera microphylla*), Organ Pipe cactus (*Stenocereus thurberi*), and the senita cactus (*Lephocereus schottii*).

Cultural Resources--Less than 1 percent of the refuge has been surveyed for archeological and historic sites. Despite the limitations of available data, over 45 prehistoric and historic sites have been recorded with the Arizona State Museum. Additionally, numerous site locations are known but have not been formally recorded. Prehistoric sites suggest ephemeral use of locations by widely dispersed, small groups of prehistoric hunter-gatherers. Shell debris on two sites point to use as a prehistoric shell trade route. Historic sites are primarily early 20th century mining camps and prospecting strikes. El Camino del Diablo is the historic corridor that was traversed from 1540 through the 1800's. The route twists and winds through the refuge, and is often incorrectly equated with the modern access road of the same name.

The refuge was the homeland of the Hia-Ced O'odham (Sand Papago). Small, dispersed bands of the Hia-Ced O'odham were encountered by Kino and by travelers on the El Camino del Diablo. The Hia-Ced O'odham ancestry may extend back more than a thousand years on the refuge.

Recreational Resources--The refuge is located in one of the hottest and driest stretches of desert in North America, and remains well preserved in its natural state. The desert wilderness provides a vast outdoor recreation area. Visitors to the refuge are able to experience the peace and quiet of the remote desert.

Recreational developments on the refuge are limited. Road trails are passable only with a 4-wheel drive vehicle. The El Camino Del Diablo route is the most popular and heavily traveled road in the refuge, passing through Papago and Tule Well, two established camp areas. Vehicles are required to stay within 50 feet of the center of the trail.

The refuge permits camping, hiking, backpacking, and hunting. Papago Well, Tule Well, and Christmas Pass are three designated camping sites with minimal amenities. There have been no developed trails and no restrictions on where backpacking and hiking may occur, though all water developments are off limit to camping. Visitors must camp no closer than 1/4 mile from the water developments. Since 1968, hunting of desert bighorn sheep has been allowed on the refuge.

Military Overflights and Activities--Airspace over 822,000 of the refuge's 860,010 acres is part of the BMGR. Military flights 1,500 feet above ground level are allowed. Potential impacts from military activities include the following: visual and noise disturbance, disturbance to wildlife behavior, shifting of use areas by raptors due to military activities, aircraft collisions with wildlife, impacts caused by live fire and military debris scattered over the refuge.

Organ Pipe Cactus National Monument

Background--The Organ Pipe Cactus National Monument was established in 1937 to preserve almost 340,000 acres of the Sonoran Desert for the enjoyment of future generations. The monument is managed by the U.S. National Park Service to perpetuate a sample of the Sonoran Desert and its natural and cultural resources and processes for the purpose of public

use, enjoyment and understanding. Other management objectives include using the monument to serve as a natural outdoor laboratory for understanding and managing Sonoran Desert ecosystems. The monument also serves as a baseline indicator against which environmental changes can be identified.

Organ Pipe Cactus National Monument is significant in a numbers of ways to a wide range of different groups. The United Nations Educational, Scientific and Cultural Organization has designated the area surrounding and including the monument as a biosphere reserve. This program was started to designate protected examples of major ecosystems which provide a baseline against which man's impact on the environment can be measured. The monument is a protected ecosystem providing habitat for a diverse array of flora and fauna, including threatened, endangered, rare and sensitive species. The monument is a site of cultural resources which reflect a long use of occupation by American Indian, Mexican, and Anglo groups. Visitors to the monument can enjoy solitude and primitive recreation in a protected natural area within the Sonoran Desert setting.

Biological Resources--The Organ Pipe Cactus National Monument is one of the most biologically diverse protected areas in the Sonoran Desert occurring in the United States. There are 55 mammalians species, 277 bird species, 48 species of herptofauna, 1 fish, and over 1,000 invertebrates have been recorded within the monument. Endangered species found in OPCNM include the lesser long-nosed bat, Sonoran pronghorn, Quitobaquito desert pupfish, and the cactus ferruginous pygmy-owl. Other species of interest include the Sonoran desert tortoise, the organ pipe shovel-nosed snake, the red-backed whiptail lizard, Acuna cactus, the Sonoyta mud turtle, and the Ajo rock daisy.

Within the park are expansive vistas of Sonoran desert landscapes, with dramatic mountain and valleys, eroding bajadas and alluvial fans, and magnificent columnar cacti. The OPCNM has five major vegetation habitat types within its borders: mixed Sonoran desertscrub, creosote-bursage, evergreen woodland/mesic evergreen scrubland, marsh and open water, and riparian communities. Only 11 percent of the vegetative species are non-native, which indicates an extremely healthy habitat.

Cultural Resources-- Evidence indicates that there has been human occupation and activity in the monument dating back 12,000 years. Sites within the monument continue to be sacred to the O'odham, including the Quitobaquito Springs and I'toi Mo'o (Montezuma's Head). O'odham continue to visit the monument to harvest the fruit from the saguaro and organ pipe cactus, gather medicinal plants, and collect water from the springs. Historic mining and ranching sites are found within the monument.

Recreational Resources--Large tracts of open space and solitude are often reasons given for visits to OPCNM. Camping, hiking, mountain biking, and scenic drives are available to visitors. An interpretive visitor center is open year-round for visitor use. Camping opportunities exist in both drive-in and primitive camping sites. The trails within the monument provide opportunities for recreation, exercise, and access to natural history and other cultural history

sites. Lack of administrative trails have led to wildcat trails appearing in popular areas. The monument has two unpaved scenic loops, the 21 mile Ajo Mountain Drive, and the 53 mile Puerto Blanco Drive. Other primitive roads exist in the monument, but a require 4-wheel drive vehicle.

Western Pima County and the Sonoran Desert Conservation Plan

Compared to other subareas, Western Pima County has the highest amount of protected land (land in Status 3b or higher). OPCNM and Cabeza Prieta NWR provide a vast amount of unbroken Sonoran Desert. The western portion of the county is largely rural and undeveloped with settlements at Ajo, Why, and Lukeville. Private lands comprise on 1.2 percent of the land base. Much of the land is federally owned and managed, and leaving limited areas for development. At the present time, there is almost no threat from development pressure in the western portions of the county. Population is very low and is estimated at 4,540 people. Due to significant amounts of environmental, cultural, and recreation values of the region as well as vast amounts of open space, resource conservation of western Pima County is consistent with the goals of the Sonoran Desert Conservation Plan.

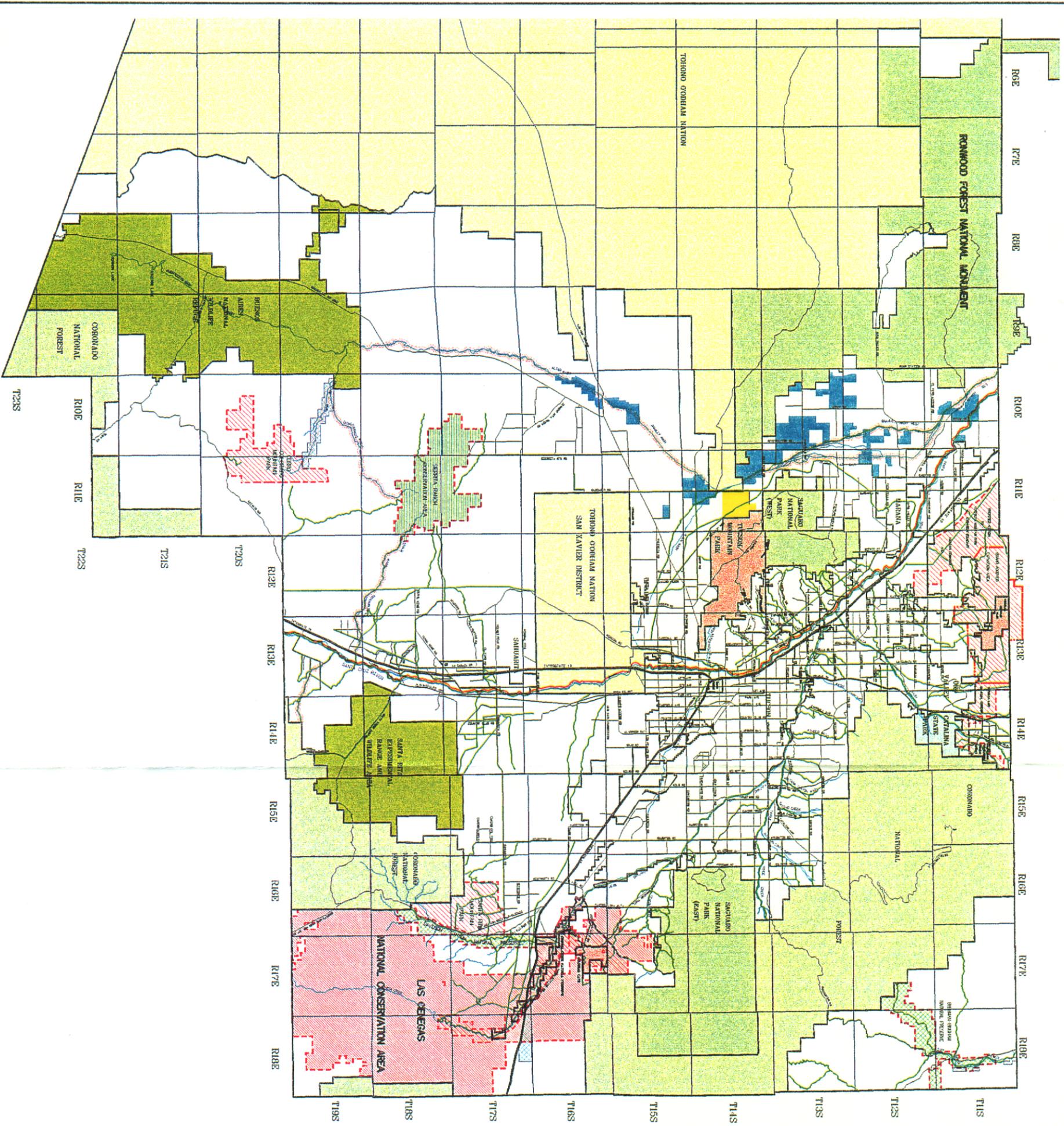
Applicable Planning Documents

The following planning documents contain information pertaining to western Pima County:

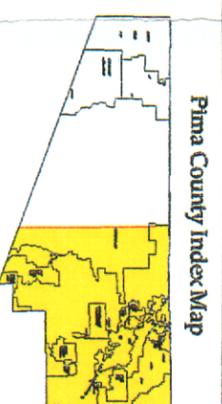
- Organ Pipe Cactus General Management Plan (1997)
- Final Programmatic Environmental Assessment for the Future Management of Cabeza Prieta National Wildlife Refuge (1998)
- Community Report for the Renewal of the Barry M. Goldwater Range Land Withdrawal

Figure 49 Pima County

Mountain Park and Natural Preserve System



- Major Roads And Streets
- Township And Range Lines
- Washes
- Administrative Boundaries
- Proposed Park Boundaries
- Trails
- Anza National Historic Trail
- Wildlife Corridor Links
- Sierra Ranch Conservation Area
- Proposed Mountain Parks
- Proposed Pima County Natural Preserves
- Riparian Habitat/Wildlife Corridor Links
- Catalina State Park
- Existing Pima County
- Indian Nation
- National Forest Land
- National Parks And Monuments
- National Wildlife Refuge
- Tucson Water Land
- Santa Rita Ranch Conservation Area
- Bureau Of Reclamation 'Wildlife Mitigation Corridor'



Index Map Scale 1:1,000,000

Pima County Index Map

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Scale 1: 150,000



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