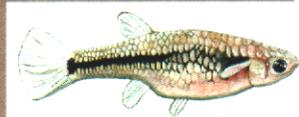
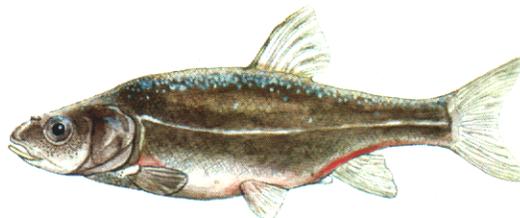
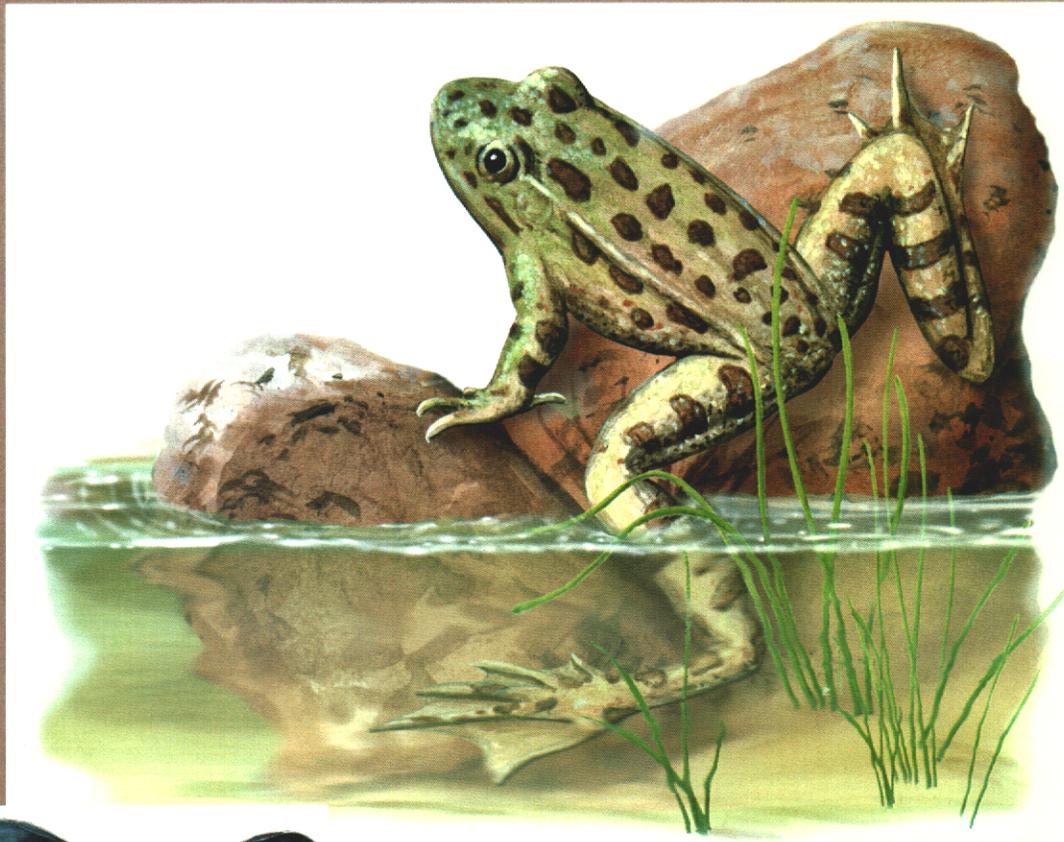


Importance of Conserving Resources in the Cienega Creek Watershed

DRAFT

Sonoran Desert Conservation Plan

July 2000



Pima County, Arizona Board of Supervisors
Mike Boyd, District 1
Dan Eckstrom, District 2
Sharon Bronson, Chair, District 3
Raymond J. Carroll, District 4
Raúl M. Grijalva, District 5

County Administrator
Chuck Huckelberry



MEMORANDUM

Date: July 24, 2000

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

From: C.H. Huckelberry
County Administrator

A handwritten signature in black ink, appearing to be "CH", is written over the printed name "C.H. Huckelberry".

Re: **Importance of Conserving Resources in the Cienega Creek Watershed**

Overview

Over the past decades there has been debate and discussion about the best use of land in the Cienega-Rincon watershed, centering around competing proposals to develop or conserve the area. The most comprehensive proposal is before Congress now, introduced by Congressman Jim Kolbe last September after an impressive community consensus formed to support the establishment of a Las Cienegas National Conservation Area. The Pima County Board of Supervisors passed a resolution in support of the Proposed Las Cienegas National Conservation Area (NCA) in October of 1999. Since that time, at least two significant developments have strengthened the rationale for elevating the conservation status of lands in and around the boundaries of the proposed Las Cienegas National Conservation Area.

First, the proposed listing of the Chirichaua Leopard Frog has increased the need for protection in the Cienega Creek watershed. On June 14, 2000, the United States Fish and Wildlife Service proposed to list the Chiricahua Leopard Frog as threatened under the Endangered Species Act. The existing locations of the Chiricahua Leopard Frog in Pima County are in the Cienega-Rincon watershed, the Upper Santa Cruz, and in stockponds in the Altar Valley. Pima County was fortunate to have contracted with Dr. Philip Rosen, a leading biologist on the topic, to draft a report on the status and potential to re-establish both the Chiricahua and Lowland leopard frog. Dr. Rosen's report, entitled *Aquatic Vertebrate Conservation in Pima County* (August 10, 2000), prescribes protections for areas including what he identifies as "the all important Empire-Cienega Ranch section of the Cienega Creek" and outlines plans for conservation and restoration of native fishes, leopard frogs, Sonoran mud turtles, and garter snakes in Pima County in both the urban and ex-urban areas of Eastern Pima County. Pima County will be able to deal proactively with the listing, but only to the extent conservation opportunities are not foreclosed in the Cienega Creek Watershed.

Second, more than 100 reports and studies have been undertaken to develop the information base for all elements of the Preliminary Sonoran Desert Conservation Plan, which will be issued next month. The Cienega-Rincon area, like the Altar Valley, has high natural and cultural resource value, and thus high conservation potential, as a watershed planning unit.

This report provides a brief summary of some of the resource issues that make the Cienega Creek watershed vital to the overall success of the Sonoran Desert Conservation Plan, and includes recommendations for conserving land within the watershed.

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

Page 2

Summary of Recommendations

For more than one decade, federal and county land use decisions in the Cienega-Rincon area increasingly have reflected a conservation commitment that recognizes the resource value of the area and respects the community's desire to see this area protected. The major land stewards have been working with the Bureau of Land Management to set new standards for balancing riparian protection and ranch conservation. It is fair to say that only a lack of intergovernmental coordination is standing in the way of effectively carrying out the hopes of the community. Pima County will continue to work with the Bureau of Land Management and maintain, as we have since the 1980s, that federal and state cooperation to conserve this area is in the best interest of all jurisdictions and the community as a whole. In anticipation of making progress in this area, the attached report suggests a priority order for protecting State Land tracts based on their natural and cultural resource value.

Priority 1 -- 28,525 acres of State Trust Land in Need of Conservation -- In addition to conserving the approximate 5,991 acres of County-owned land, 36,520 acres of BLM land, and 48 acres of Forest Service land found within the Pima County jurisdictional area of the proposed Las Cienegas National Conservation Area, approximately 28,525 acres of State Land should be committed to conservation status. Nine specific sites are identified for conservation. These sites are important to native fish and frog protection and reintroduction, and allow for exotic species management opportunities so that we can proactively deal with endangered species compliance and recovery matters. This minimum reserve would total 71,084 acres, without private land included.

Priority 2 -- 63,293 acres of State Land in Need of Conservation -- When the 28,525 acres of State Land referenced above are secured for conservation purposes, another tier of State Land tracts have been identified as important to protect. Under this proposal, five additional sites are identified for conservation, bringing the total State Land contribution to 63,293 acres. This reserve would total 105,852 acres, without private land included.

Priority 3 -- 89,641 acres of State Land in Need of Conservation -- The remaining State Land within the original concept map for the NCA becomes important to protect when the priorities described above are met. Approximately 89,641 acres of State Land within the original concept map of the NCA in Pima County would be committed to conservation status. This reserve within Pima County would total 132,200 acres, without private land included.

Priority 4 -- 91,114 acres of State Land in Need of Conservation -- The Lake area to the west of the Las Cienegas NCA boundary was identified within the top priority tracts for protection. The Barrel Spring tract, also to the west is important too, for its high resource value. The 89,641 acres of State Land within the original concept map of the NCA in Pima County would be committed to conservation status, along with 1,473 acres to the west of the area. This reserve within Pima County would total 133,673 acres, without private land included.

Maps of each of these priority areas are on the next pages, followed by a composite map that reflects how land conservation would progress as the community moved from one tier to the next, as the different levels of priority protection commitments are achieved.

Conservation Resources in the Las Cienegas NCA

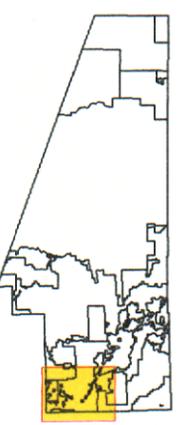
Priority 1 - 28,525 Acres

-  Las Cienegas NCA Boundary
-  Administrative Boundaries
-  County Lines
-  Federal Ownership
-  State Ownership
-  Pima County Ownership
-  City of Tucson Ownership
-  Private Ownership
-  No record
-  Selected Lands

STATE LANDS = 28,525 ac.

Ownership source: Pima County Assessor

Pima County Index Map



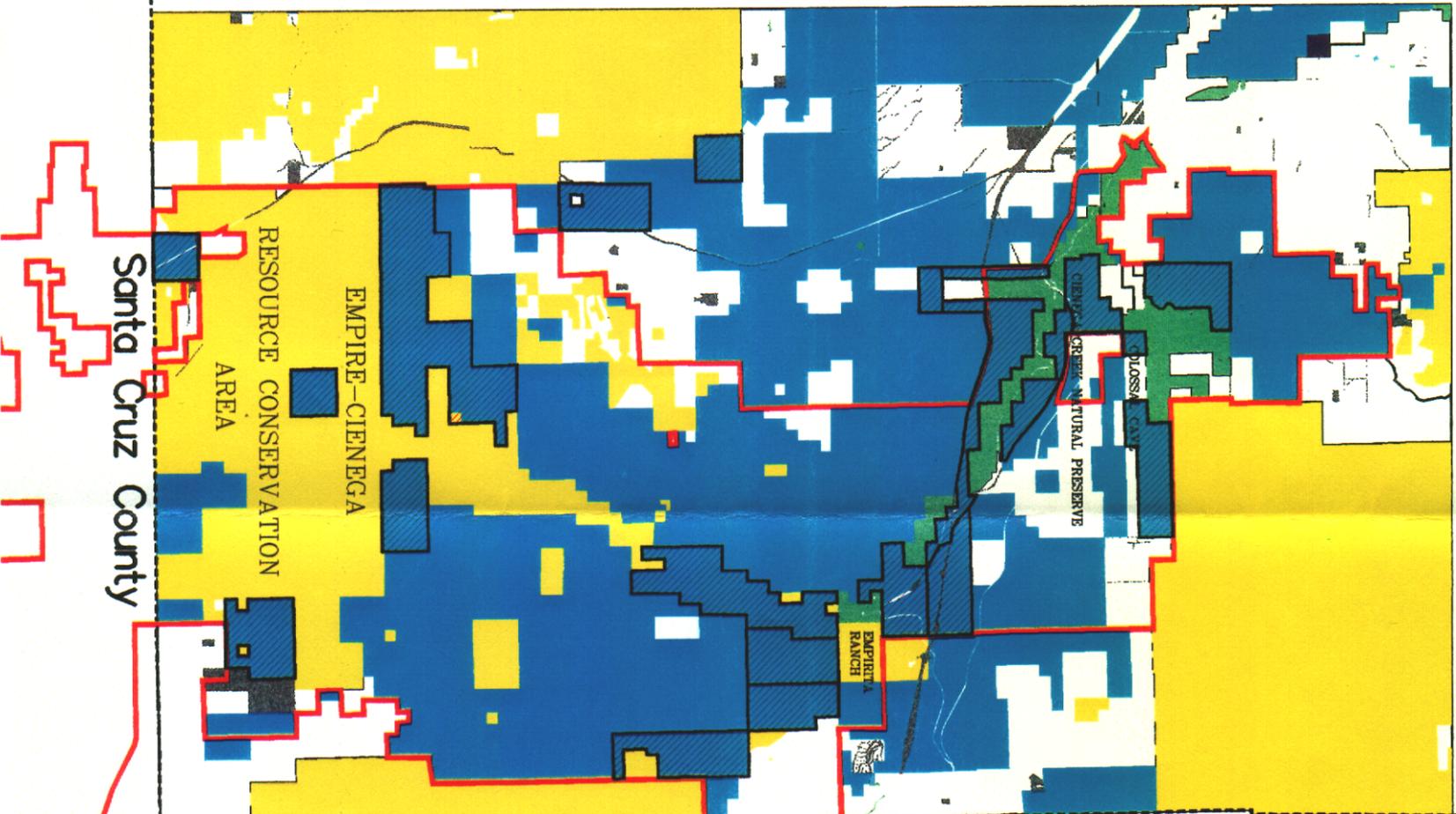
Index Map Scale: 1:1,000,000

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Scale: 1:57,000



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 Tucson, AZ 85724-8870 FAX: (520) 798-3429
 http://www.dot.co.pima.az.us



Cochise
County

Santa Cruz
County

EMPIRE-CIENEGA
RESOURCE CONSERVATION
AREA

EMPIRE
RANCH

CIENEGA CREEK NATURAL PRESERVE

CLOSSON CANYON

Conservation Resources in the Las Cienegas NCA

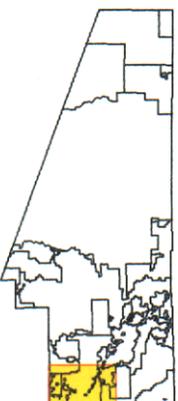
Priority 2 - 63,293 Acres

-  Las Cienegas NCA Boundary
-  Administrative Boundaries
-  County Lines
-  Federal Ownership
-  State Ownership
-  Pima County Ownership
-  City of Tucson Ownership
-  Private Ownership
-  No record
-  Selected Lands

STATE LANDS = 63,293 ac.

Ownership source: Pima County Assessor

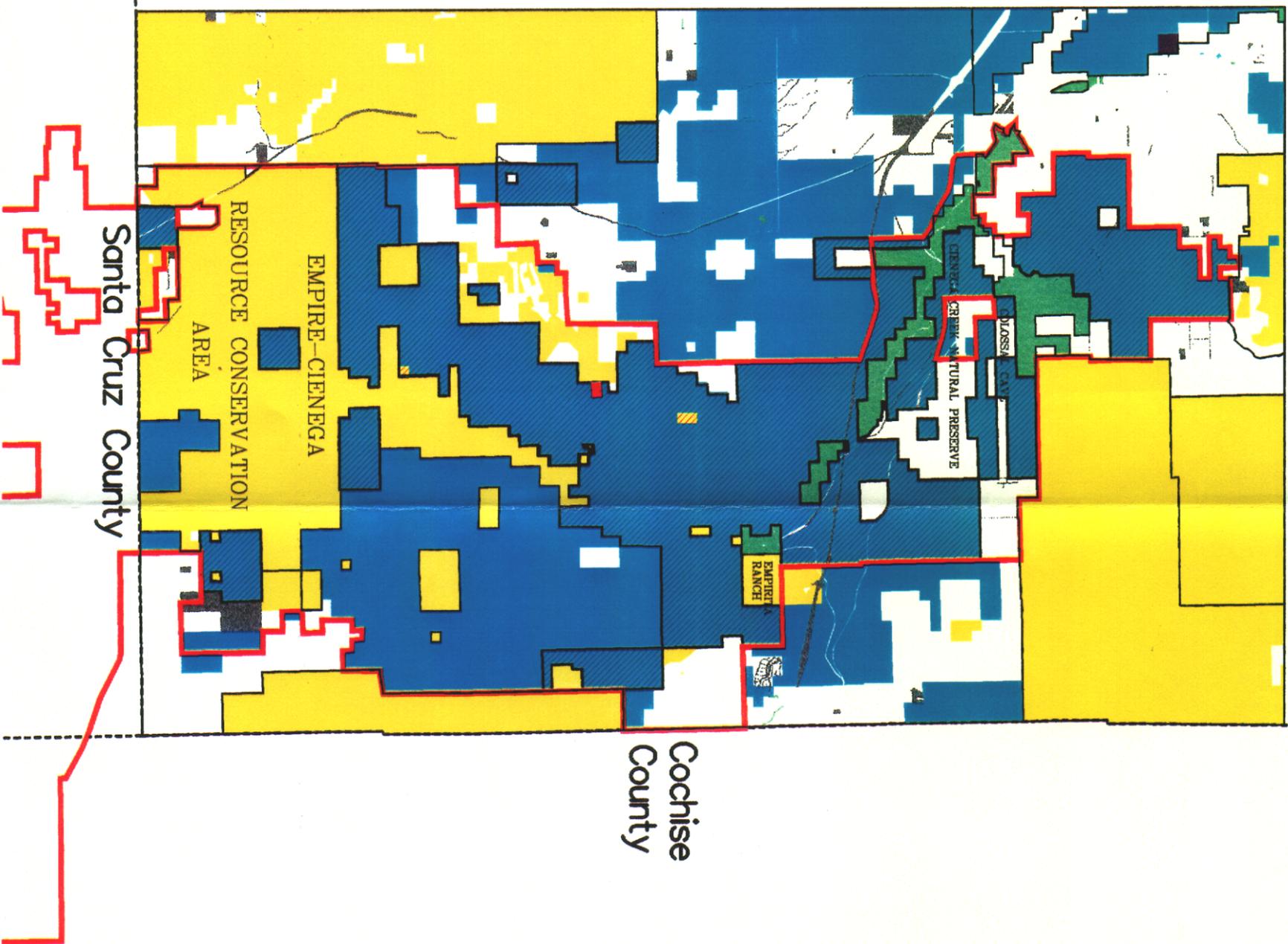
Pima County Index Map



Index Map scale: 1:54,000

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Scale 1:54,000



Santa Cruz County

Cochise County

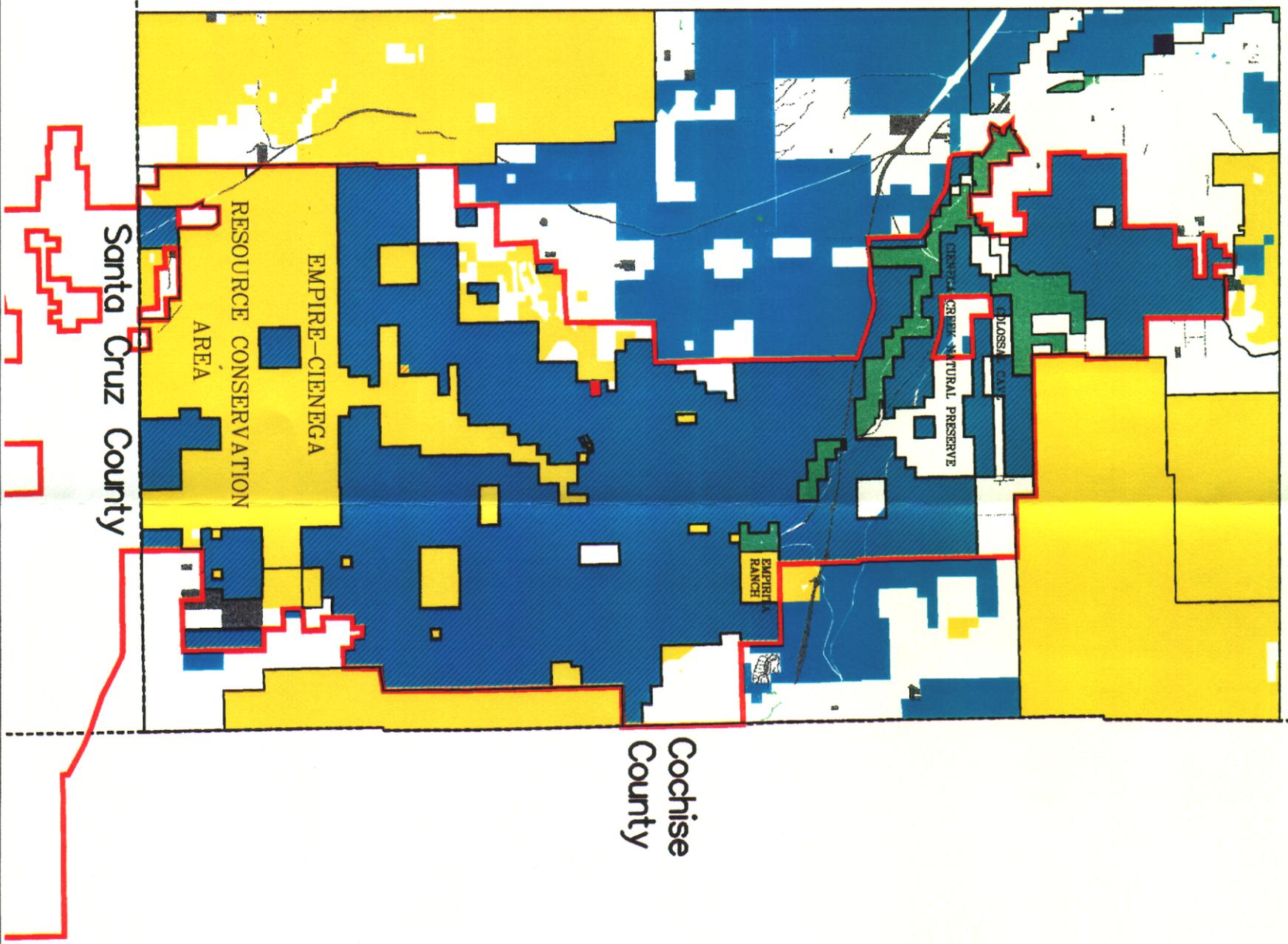
PIMA COUNTY DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES

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201 North Stone Avenue - 9th Floor
Tucson, Arizona 85701-5877
Tel: 520-799-3429
http://www.dot.az.gov



Conservation Resources in the Las Cienegas NCA

Priority 3 - 89,641 Acres

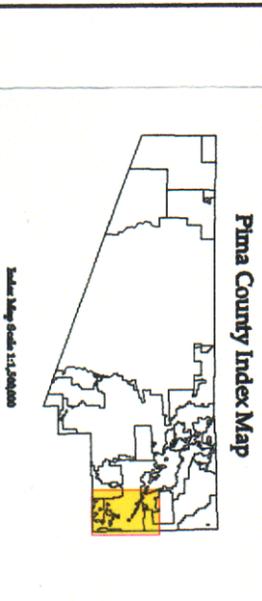


- Las Cienegas NCA Boundary
- Administrative Boundaries
- County Lines
- Federal Ownership
- State Ownership
- Pima County Ownership
- City of Tucson Ownership
- Private Ownership
- No record
- Selected Lands

OWNERSHIP WITHIN NCA

STATE LANDS	89,641 ac.
BLM LANDS	36,520 ac.
COUNTY PARK LANDS	5,991 ac.
NATIONAL FOREST LANDS	48 ac.
PRIVATE LANDS	14,875 ac.
TOTAL	147,075 ac.

Ownership source: Arizona State Land Department



The information depicted on this map is the result of a field visit to the area on 07/05/00. The information is not intended to be used for any purpose other than the general information provided. The information is not intended to be used for any purpose other than the general information provided. This project is subject to the Department of Transportation Technical Services Division's use restriction agreement.

Scale 1: 64,000

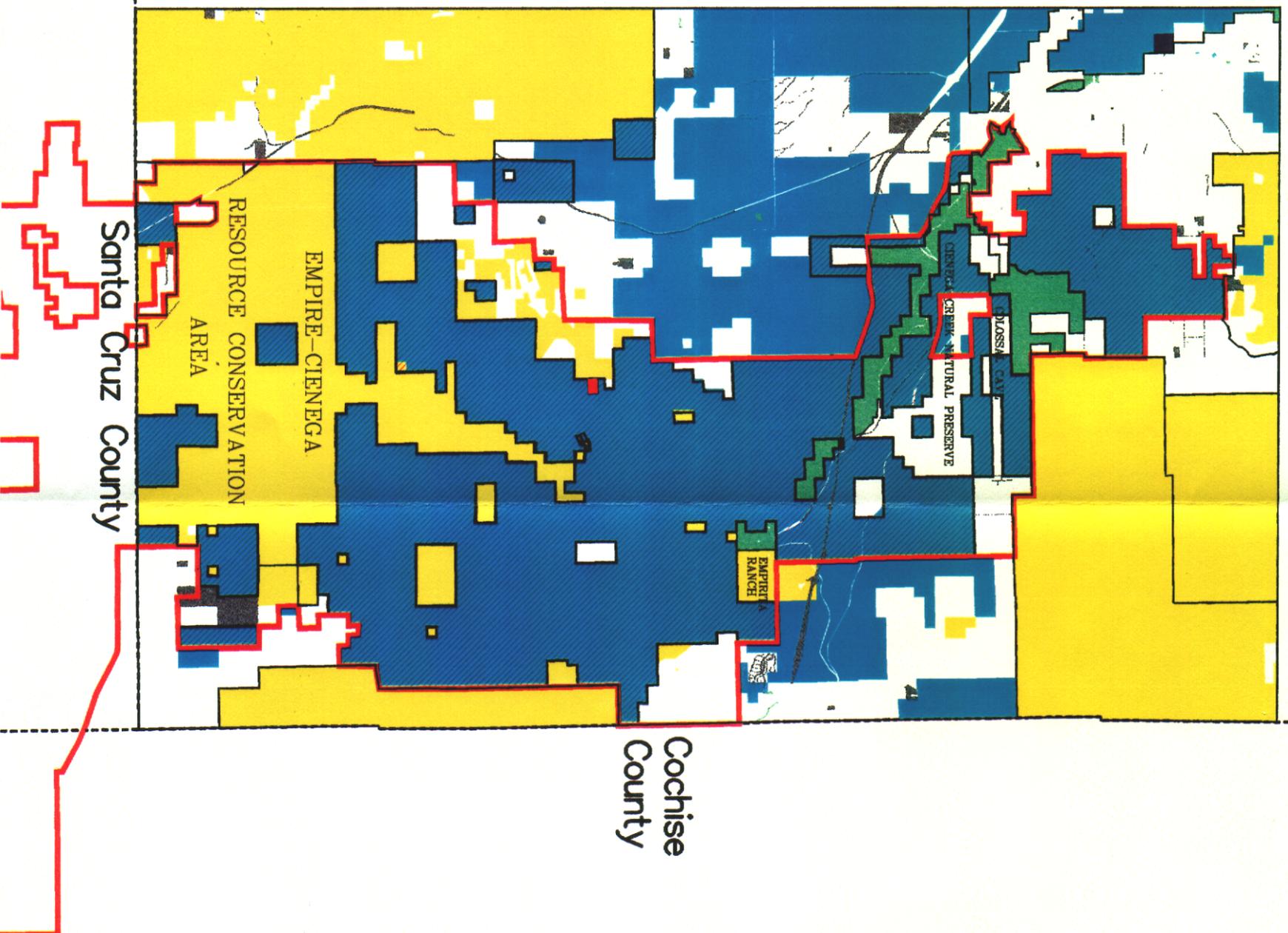
PIMA COUNTY DEPARTMENT OF TRANSPORTATION
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http://www.ddt.co.pima.az.us

Plot Date: 07/05/00

Conservation Resources in the Las Cienegas NCA

Priority 4 - 91,114 Acres

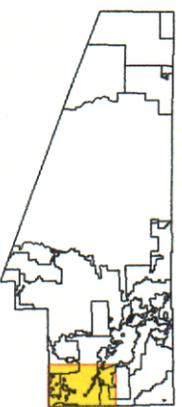


- Las Cienegas NCA Boundary
- Administrative Boundaries
- County Lines
- Federal Ownership
- State Ownership
- Pima County Ownership
- City of Tucson Ownership
- Private Ownership
- No record
- Selected Lands

OWNERSHIP WITHIN & WEST OF NCA

STATE LANDS.....	91,114 ac.
BLM LANDS.....	36,520 ac.
COUNTY PARK LANDS.....	5,991 ac.
NATIONAL FOREST LANDS.....	48 ac.
PRIVATE LANDS.....	14,875 ac.
TOTAL	148,548 ac.

Ownership source: Arizona State Land Department



Index Map Scale: 1:1,000,000

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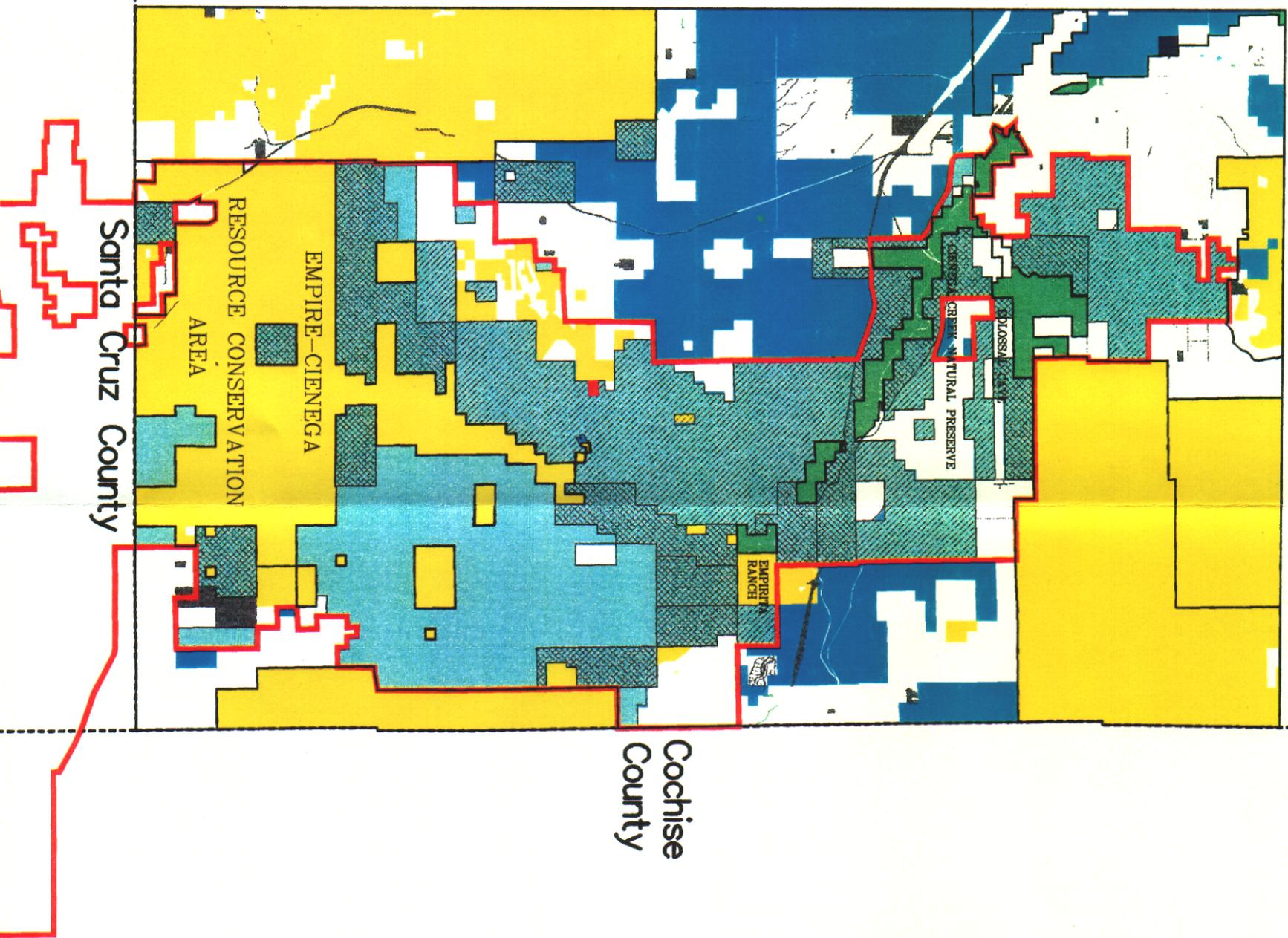
Scale 1:64,000



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Conservation Resources in the Las Cienegas NCA Priorities 1, 2, and 4

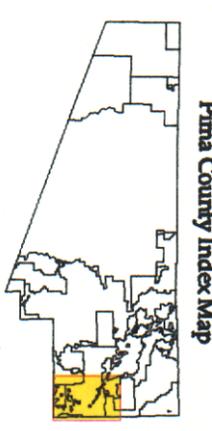


- Las Cienegas NCA Boundary
- Administrative Boundaries
- County Lines
- Federal Ownership
- State Ownership
- Pima County Ownership
- City of Tucson Ownership
- Private Ownership
- No record
- Priority 4 - 91,114 Ac.
- Priority 2 - 63,298 Ac.
- Priority 1 - 28,525 Ac.

OWNERSHIP WITHIN NCA

STATE LANDS	89,641 ac.
BLM LANDS	36,520 ac.
COUNTY PARK LANDS	5,991 ac.
NATIONAL FOREST LANDS	48 ac.
PRIVATE LANDS	14,875 ac.
TOTAL	147,075 ac.

Ownership source: Arizona State Land Department



The information depicted on this display is the result of a data collection project funded by the U.S. Department of the Interior, Bureau of Land Management. The collection of accurate information is a continuous process. The information is subject to change without notice. This project is subject to the Department of Transportation Technical Services Division's User Restriction Agreement.

Scale 1: 64,000

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Plotter: 07/07/00

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

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The Importance of the Cienega Creek Watershed

The stated purpose for establishing the Las Cienegas National Conservation Area is to "conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, agricultural, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and value of the public land ... while allowing environmentally responsible and sustainable livestock grazing and recreation to continue in appropriate areas."

The proposed Las Cienegas National Conservation Area is consistent with the Sonoran Desert Conservation Plan in that its purpose is the practical balancing of multiple resources across a landscape that is vast enough to support diverse values. The leadership of the Bureau of Land Management in the area, the progressive stewardship of the ranch community in the Empire Cienega area, and now the approach proposed to protect a listed species all point toward this community's ability to adopt and implement a more broadbased and effective conservation ethic than has been seen in the past.

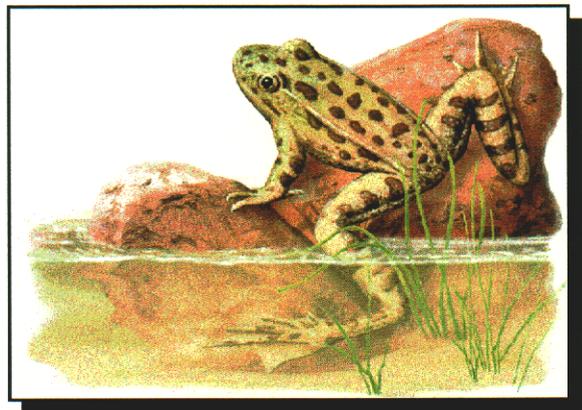
New Approach to Compliance Issues

On June 14, 2000, the United States Fish and Wildlife Service published in the Federal Register notice of a proposal to list the Chiricahua Leopard Frog as threatened. Given the tenuous state of the population, listing is anticipated. The dewatering of cienegas and resulting habitat loss, in addition to predation and competition from non-natives such as bullfrogs, are known threats to the Chiricahua Leopard Frog, found now only in the Cienega-Rincon watershed, limited areas of the Upper Santa Cruz, and in stockponds in the Altar Valley area within Pima County. Water management activities such as groundwater pumping and surface water diversions fall within the definition of potential "take." The proposed rule provides a way for the community to manage our way out of the precarious position that listings can cause.

A 4(d) rule is included which would exempt from Section 9 liability, take by livestock use or maintenance activities at stock tanks on private lands. This rule recognizes the importance of stock tanks to existing populations and at the same time confirms the dire state of the overall population.

Consistent with the Ranch Conservation element of the SDCP, this rule aligns the incentives of the major stewards of the resource with the goal of conserving the species.

CHIRICAHUA LEOPARD FROG



Importance of Conserving Resources in the Cienega Creek Watershed

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Regional Significance of the Cienega Creek to Native Fish and Frogs

Soon after publication of the proposed listing Pima County issued a report by Dr. Philip Rosen, a leading biologist in the area, entitled *Aquatic Vertebrate Conservation in Pima County*. Dr. Rosen outlines plans for conservation and restoration of native fishes, leopard frogs, Sonoran mud turtles, and garter snakes in Pima County in both the urban and ex-urban areas of Eastern Pima County.

The report discusses the conservation potential of forty key canyons, identifying the presence of both native and non-native aquatic species, and suggesting specific actions ranging from removal of harmful exotics, to reintroduction of natives, to specific management prescriptions, to necessary partnerships and priority acquisitions.

Dr. Rosen's report makes it clear that our problems extend beyond the leopard frog listing, and include the crash the entire aquatic system. At the same time, *Aquatic Vertebrate Conservation in Pima County* provides the draft of a blueprint for Eastern Pima County to begin to address in a serious fashion our aquatic restoration needs after more than a century of refusing to face them. Dr. Rosen provides an ingenious method for working with, and improving upon, our current circumstances.

An important point is this: the ability to repair aquatic systems will depend our ability to maintain and protect what Dr. Rosen calls "the all important Empire-Cienega section of the Cienega Creek." His report speaks to the need to conserve the Cienega Creek watershed.

Regional Significance of the Cienega Creek to Multiple Species and Multiple Resources

Within this opening statement of the legislation for the proposed Las Cienegas National Conservation Area, each of the six elements of the Sonoran Desert Conservation Plan finds support.

A few data sets are presented here, excerpted from the more than 100 studies that have been undertaken to develop the information base for all elements of the Preliminary Sonoran Desert Conservation Plan. The Cienega-Rincon area, like the Altar Valley, has high natural and cultural resource value, and thus high conservation potential as a watershed planning unit.

■ Summary of Priority Vulnerable Species by Subarea

The chart below combines the total number of priority vulnerable species from the categories mammals, birds, reptiles, amphibians, fish, invertebrates, and plants, and ranks the areas from most to least number of species within the area that need protection due to their imperiled status. Just as the Cienega-Rincon and Altar Valley have the highest percent of priority streams (described below), these two watershed planning units have the greatest number of priority vulnerable species.

WATERSHED SUBAREA	NUMBER OF PRIORITY VULNERABLE SPECIES
Altar Valley	31
Cienega-Rincon	29
Upper Santa Cruz	23
Middle Santa Cruz	22
Tortolita Fan	17
Western Pima County	17
Avra Valley	16
Middle San Pedro	16

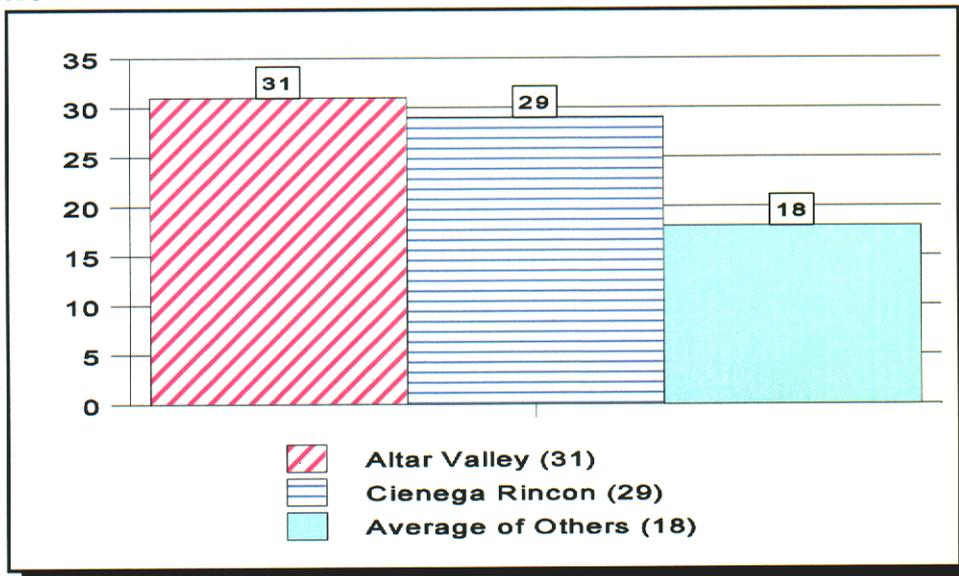
■ Summary of Priority Vulnerable Species by Taxonomic Group

The chart below shows the number of priority vulnerable species from each taxonomic group, with the Cienega-Rincon and Altar Valley subareas compared to the average of the other six watershed planning units.

<u>SUBAREA</u>	MAMMAL	BIRDS	FISH	AMPHIB	REPTILES	INVERT	PLANTS	TOTAL
CIENEGA-RINCON WATERSHED	7	7	3	2	2	5	3	29
ALTAR VALLEY WATERSHED	7	7	2	2	4	7	2	31
AVERAGE OF OTHER SIX WATERSHEDS	6	6	0.8	0.7	2.2	1.2	1.5	18

■ Source: *Priority Vulnerable Species*, June 8, 2000

NUMBER OF PRIORITY VULNERABLE SPECIES BY WATERSHED



■ Priority Vulnerable Mammal Species

Nine mammals are considered to be priority vulnerable species. Seven are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

■ Priority Vulnerable Bird Species

Eight birds are considered to be priority vulnerable species. Seven are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

■ Priority Vulnerable Fish and Amphibian Species

Six fish and two amphibian species are considered to be priority vulnerable species. Half of the fish and both amphibians are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

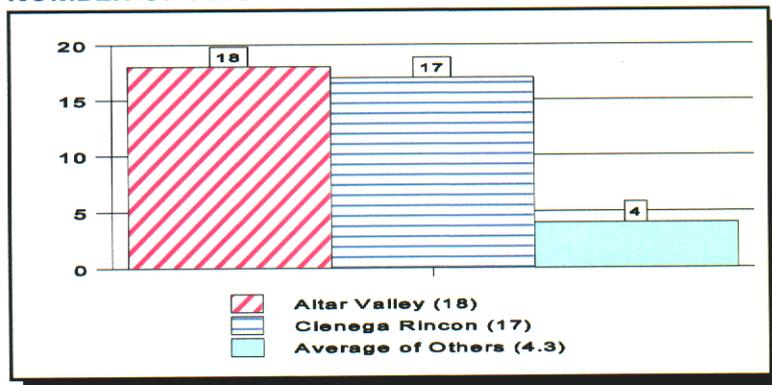
Page 12

- Prioritization of Streams for Conservation in Pima County** -- Streams that ranked in the top 20 by the following parameters are recommended for priority consideration: perennial stream length and intermittent stream length; area of hydro-mesoriparian vegetation and of xeroriparian Class A vegetation; area of shallow groundwater; and presence of native fish.

Over 50 percent of the priority streams within the County are found within the Altar Valley and the Cienega Rincon area.

SDCP Planning Unit	Number of Priority Streams	Percentage of Total
1. Middle San Pedro	8	12
2. Cienega Rincon	17	26
3. Upper Santa Cruz	3	4
4. Middle Santa Cruz	9.5	15
5. Tortolita Fan	5.5	8
6A. Altar Valley	18	28
6B. Avra Valley	2	3
7. Tohono Nation	1	2
8. Western Pima Co.	1	2
Total	65	100

NUMBER OF PRIORITY STREAMS BY WATERSHED



Importance of Conserving Resources in the Cienega Creek Watershed

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■ Potentially covered species in need of riparian areas

Potentially covered species are those for which an incidental take permit might be sought under the Endangered Species Act. The potentially covered species thought to need riparian areas are summarized by subarea in the table below.

Common Name	Included in Cienega Rincon Subarea?
Mexican Long-tongued Bat	yes
Merriam's Mouse (Mesquite Mouse)	yes
Western Yellow Bat	
Allen's Big-eared Bat	yes
Western Red Bat	yes
Arizona Shrew	
Southwestern Willow Flycatcher	yes
Western Yellow-billed Cuckoo	yes
Cactus Ferruginous Pygmy-Owl	yes
Abert's Towhee	yes
Bell's Vireo	yes
Chiricahua Leopard Frog	yes
Lowland Leopard Frog	yes
Mexican Garter Snake	yes
Red-backed Whiptail Lizard	
Giant Spotted Whiptail	
Sonora Sucker	
Gila Chub	yes
Desert Pupfish	
Longfin Dace	yes
Gila Topminnow	yes
Desert Sucker	
Huachuca Water Umbel	yes

■ Native Fish and Frogs

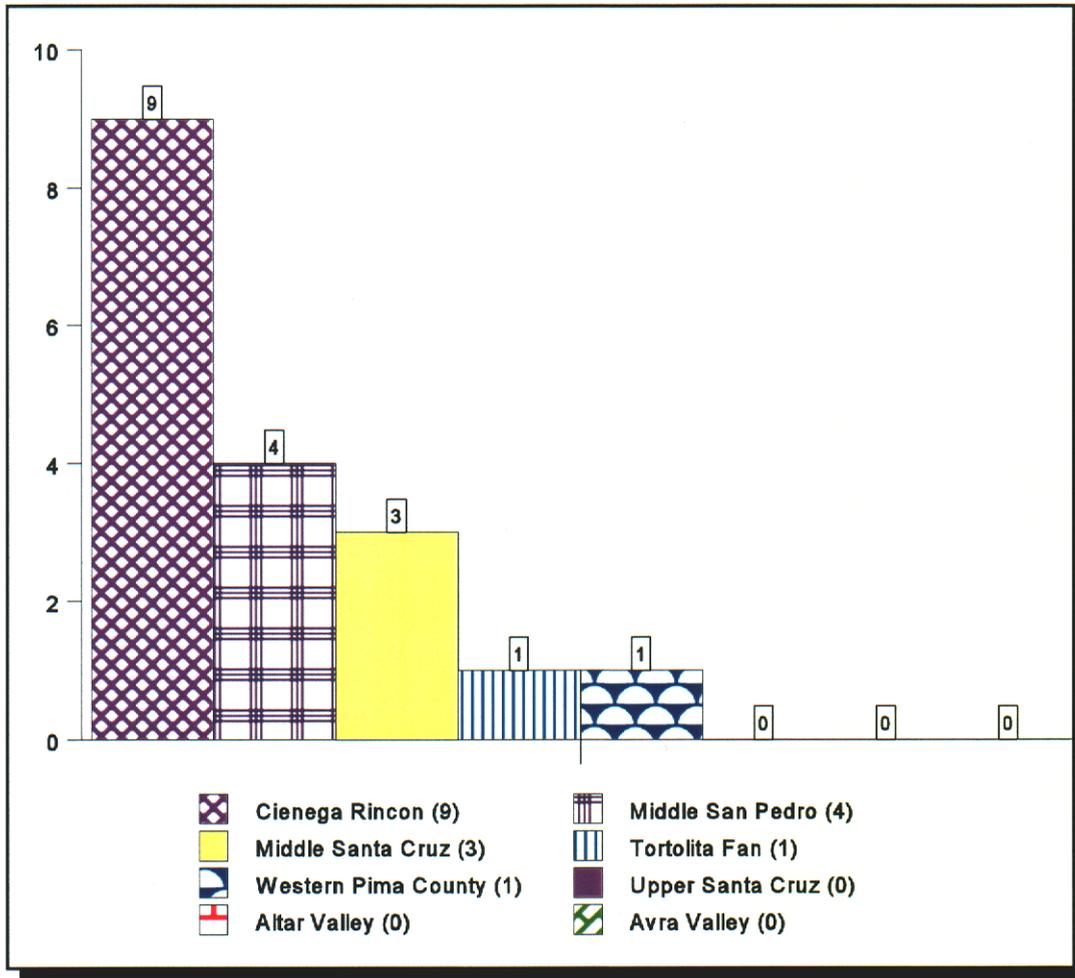
Watercourses associated with existing or very recently extirpated populations of native fish and frogs are listed in the tables below. The Cienega Rincon area far exceeds other subareas by this measure. This information was developed by Pima County by consulting experts knowledge, literature review and HDMS records.

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

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NUMBER OF WATERCOURSES PER SUBAREA KNOWN TO BE ASSOCIATED WITH EXISTING OR RECENTLY EXTIRPATED POPULATIONS OF NATIVE FISH



Summary

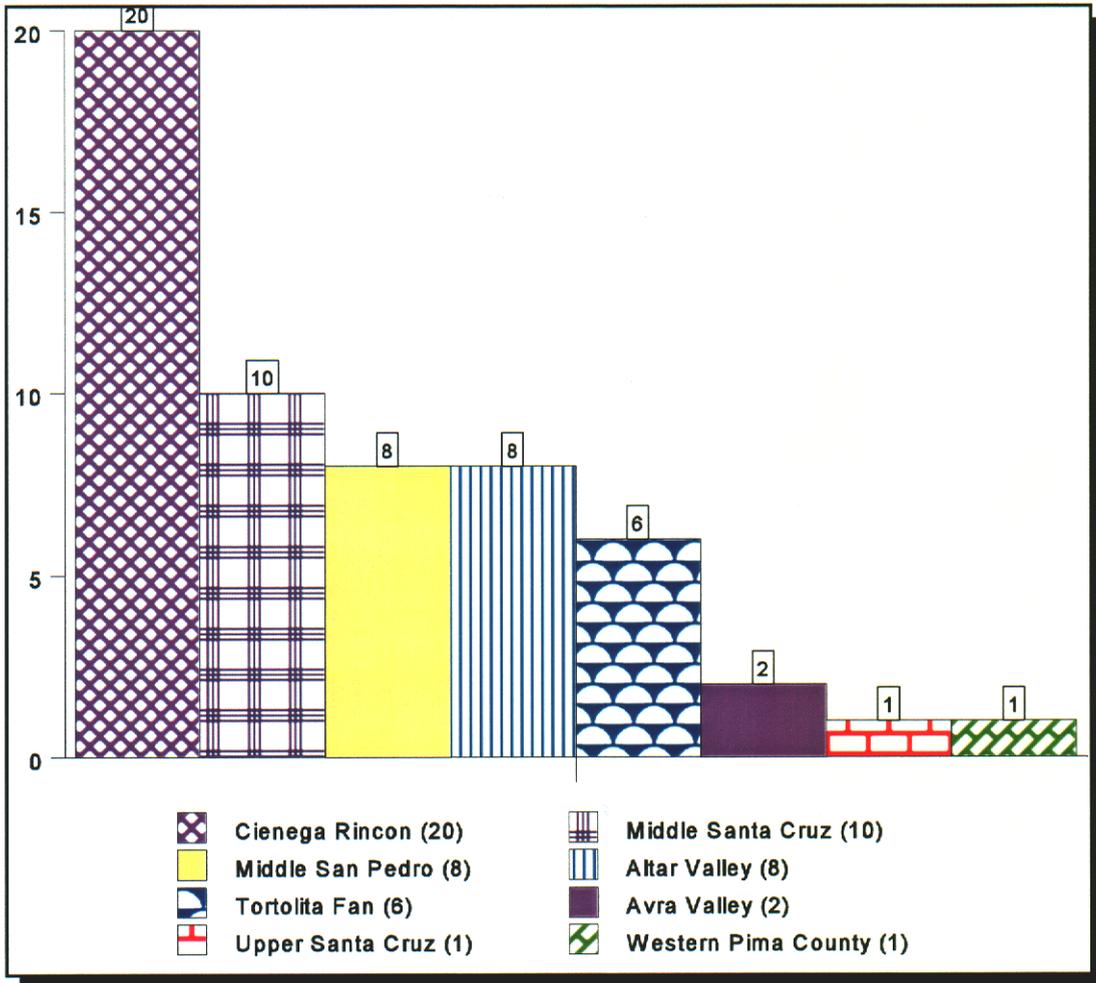
- Having 9 watercourses associated with native fish, the Cienega Rincon area has more than twice the number of any other watershed
-

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

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NUMBER OF WATERCOURSES PER SUBAREA KNOWN TO BE ASSOCIATED WITH EXISTING OR RECENTLY EXTIRPATED POPULATIONS -- NATIVE FROGS



Summary

- Having 20 watercourses associated with native frogs, the Cienega Rincon area has more than twice the number of the second highest resource value watershed by this measure
-

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

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- Cultural Resources Element** -- An analysis of the conservation potential of each watershed for cultural resources was conducted measuring four variables: sensitivity, integrity, legal protection and development threat. Among the Eastern Pima County watershed planning units, the Cienega-Rincon area rated second of seven subareas. It is worth noting that the proposed National Conservation Area now before Congress is sufficient in size and scope to encompass most of the predicted high sensitivity areas for cultural resources and would thus extend a measure of protection for these resources in a manner that is consistent with the goals of the Sonoran Desert Conservation Plan.

<u>RANK BY SUBAREA</u>	FUTURE THREAT	SENSITIVITY	LEGAL PROTECTION	INTEGRITY OF RESOURCE BASE	CONSERVATION POTENTIAL
SAN PEDRO	LOW	MED	HIGH	HIGH	1st of 7 subareas
CIENEGA RINCON	MED	HIGH	MED	MED	2nd of 7 subareas
AVRA VALLEY	MED	MED	MED	MED	3rd of 7 subareas
ALTAR VALLEY	MED	MED	MED	MED	3rd of 7 subareas
UPPER SANTA CRUZ	MED	MED	LOW	MED	5th of 7 subareas
TORTOLITA	HIGH	HIGH	LOW	LOW	6th of 7 subareas
MIDDLE SANTA CRUZ	HIGH	MED	MED	LOW	7th of 7 subareas

- Ranch Conservation Element** -- The proposed National Conservation Area supports the element of the Sonoran Desert Conservation concept which seeks to keep ranches from being subdivided. The Empire-Cienega Resource Conservation Area has become a laboratory for the exercise of a conservation ethic which reflects the growing understanding among the ranch community that science-based practices and protection of habitat lead to ecologically sound and financially viable ranching. By virtue of its extensiveness as a land use and the ongoing land stewardship provided by ranchers, ranching in Pima County is uniquely suited to preserve natural, unfragmented open space, habitat, and the land's natural and cultural resource values. Consequently, ranch conservation was identified by the Pima County Board of Supervisors as a conservation element of the Sonoran Desert Conservation Plan.

Importance of Conserving Resources in the Cienega Creek Watershed

July 24, 2000

Page 17

- In order to characterize ranching as a land use, data were gathered both regionally and by subarea to objectively describe, map, and quantify this land use in terms of its extent, productive capacity, threats, and conservation potential. A simple but multivariate analysis was conducted to evaluate ranch lands and ranching as a land use throughout Pima County. What results is the following preliminary assessment and comparative rankings of the different subareas.

Highest Extent of Ranch Lands

1. Altar Valley
2. **Empire-Cienega Valley**
3. Upper Santa Cruz Valley
4. San Pedro Valley
5. Avra Valley
6. Tortolita Fan
7. Western Pima County
8. Middle Santa Cruz Valley

Highest Productivity / Capacity

1. **Empire-Cienega Valley**
2. Altar Valley
3. Upper Santa Cruz Valley
4. San Pedro Valley
5. Middle Santa Cruz Valley
6. Tortolita Fan
7. Avra Valley
8. Western Pima County

Highest Threats to Ranchlands

1. Middle Santa Cruz Valley
2. Tortolita Fan
3. Upper Santa Cruz Valley
4. Avra Valley
5. Empire-Cienega Valley
6. Altar Valley
7. Western Pima County
8. San Pedro Valley

Highest Conservation Potential

1. Altar Valley
2. **Empire-Cienega**
3. Upper Santa Cruz Valley
3. San Pedro Valley
4. Western Pima County
5. Avra Valley
6. Tortolita Fan
7. Middle Santa Cruz

- Ranch Conservation Potential:

The establishment of the Las Cienegas National Conservation Area will contribute greatly to the potential for much of the Empire-Cienega Valley to remain a viable area for sustainable ranching. Other factors that support sustainable ranching in the proposed NCA include the relative stability and long-term tenure of ranch lands comprised of private lands, State lands, BLM, and National Forest leases; the limited acreage of public lands designated for sale or commercial use outside the proposed NCA; low population pressure outside the urbanizing northwestern portion of the valley; the relatively long distance and access to the valley south of I-10 from the Tucson area; its proximity to existing preserves that allow grazing; a high proportion of productive grasslands; good average rainfall; and relatively high grazing capacity. The Empire-Cienega Valley watershed currently has a high potential to continue sustainable ranching due in large measure to the proposed establishment of the Las Cienegas National Conservation Area.

Ranch Land Conservation

Highest Potential for Ranch Land Conservation

- 1 Alter Valley
- 2 Empire-Cienega Valley
- 3 Upper Santa Cruz Valley
- 3 San Pedro Valley
- 4 Western Pima County
- 5 Avra Valley
- 6 Tortolita Fan
- 7 Middle Santa Cruz Valley

Planning Units

1. San Pedro Valley
2. Cienega-Rincon Valley
3. Upper Santa Cruz Valley
4. Middle Santa Cruz Valley
5. Tortolita Fan
- 6a. Alter Valley
- 6b. Avra Valley
7. Tohono O'odham
8. Western Pima County

Pima County Index Map



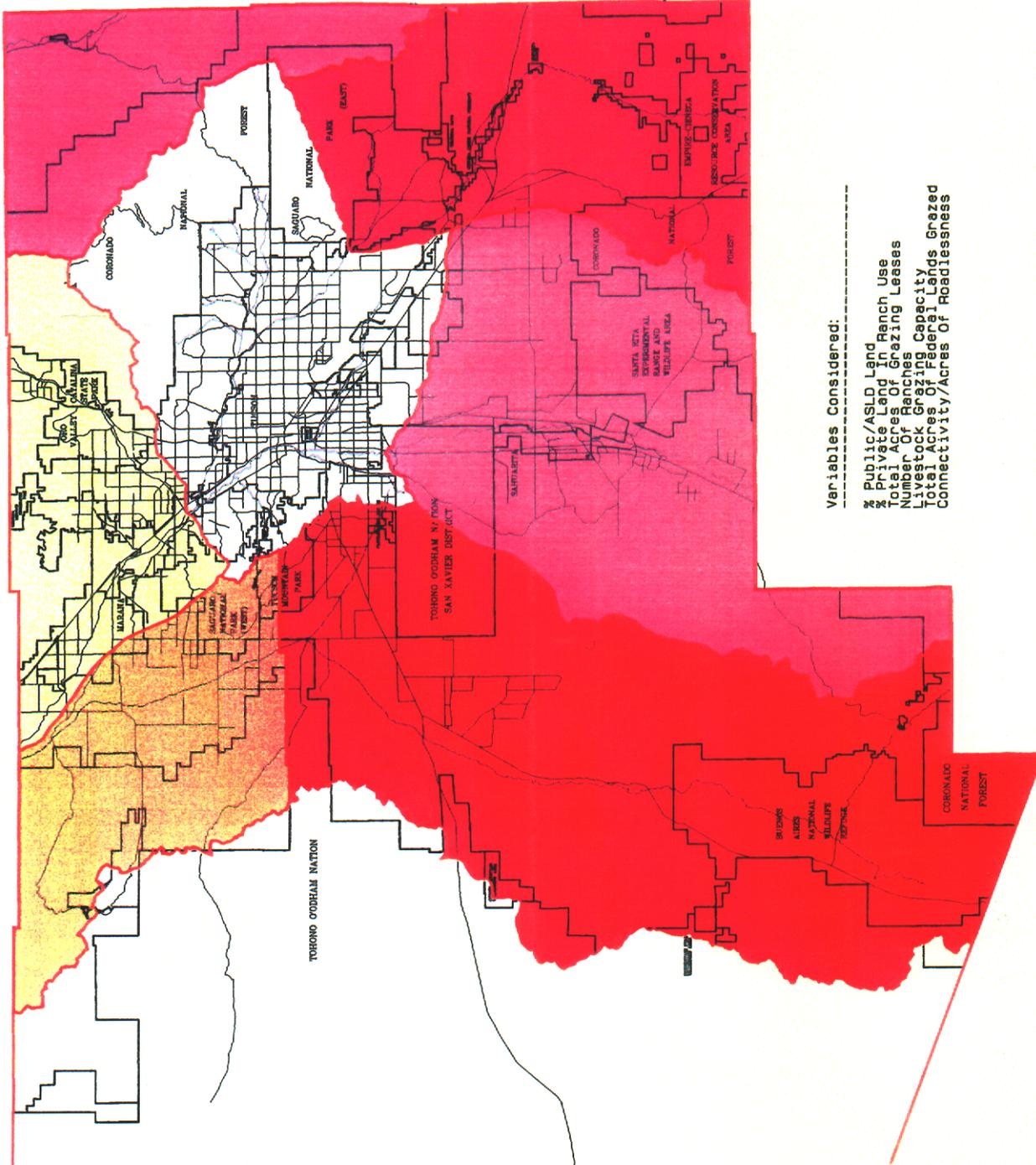
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Scale 1: 100,000



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Variables Considered:

- % Public/ASLD Land
- % Private Land in Ranch Use
- Total Acres Of Grazing Leases
- Livestock Carrying Capacity
- Total Acres Of Private Lands Grazed
- Connectivity/Acres Of Roadlessness

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Conclusion

Since legislation was introduced to establish the Las Cienegas National Conservation Area, regulatory events and research conducted to draft the Sonoran Desert Conservation Plan have strengthened the rationale for elevating the conservation status of lands in and around the boundaries of the proposed Las Cienegas National Conservation Area.

This report suggests a priority order for protecting State Land tracts based on their natural and cultural resource value as an initial framework for conservation action.

Protecting the Cienega Creek watershed is major positive step for advancing conservation in Southern Arizona. It benefits not only the watershed planning unit, but the entire region. By making a long term commitment to conserve natural resources in defined parts of the region, we will also create certainty for other land uses.

The proposed National Conservation Area, consistent with the Pima County Sonoran Desert Conservation Plan initiated by the Board of Supervisors, holds a great deal of promise for the long term stability of the economic and natural resources of our region.

The Las Cienegas National Conservation Area has strong and diverse support from those who understand the importance of creating a balance of fiscal and natural resources through landscape planning that will improve the quality of life for many generations of Tucson citizens.

For these and other reasons, the Cienega Creek watershed deserves federal attention and protection.

IMPORTANCE OF CONSERVING RESOURCES IN THE CIENEGA CREEK WATERSHED

On October 5, 1999, the Pima County Board of Supervisors passed Resolution 1999-204, to support the Proposed Las Cienegas National Conservation Area (NCA), consistent with the larger Sonoran Desert Conservation Plan. Since that time, events and additional information have served to emphasize the importance of conserving resources in the Cienega Creek watershed, including:

- On June 14, 2000, the United States Fish and Wildlife Service proposed to list the Chiricahua Leopard Frog as threatened under the Endangered Species Act. The existing locations of the Chiricahua Leopard Frog in Pima County are in the Cienega-Rincon watershed, the Upper Santa Cruz, and in stockponds in the Altar Valley.
- Pima County contracted with Dr. Philip Rosen, a leading biologist on the topic, to draft a report on the status and potential to re-establish both the Chiricahua and Lowland leopard frog. Dr. Rosen's report, entitled *Aquatic Vertebrate Conservation in Pima County* (August 10, 2000), prescribes protections for areas including what he identifies as "the all important Empire-Cienega Ranch section of the Cienega Creek" and outlines plans for conservation and restoration of native fishes, leopard frogs, Sonoran mud turtles, and garter snakes in Pima County in both the urban and ex-urban areas of Eastern Pima County
- Over 100 reports and studies have been undertaken to develop the information base for all elements of the Preliminary Sonoran Desert Conservation Plan, which will be issued next month. The Cienega-Rincon area, like the Altar Valley, has high natural and cultural resource value, and thus high conservation potential, as a watershed planning unit.

The information found in many of these reports, together with a recent proposed listing for the Chiricahua Leopard Frog, strengthens the reasons for elevating the conservation status of lands in and around the boundaries of the proposed Las Cienegas National Conservation Area. This report provides a brief summary of some of the resource issues that make the Cienega Creek watershed vital to the overall success of the Sonoran Desert Conservation Plan, and includes recommendations for conserving land within the watershed. While federal and county land aspire to a conservation commitment that recognizes the resource value of the area, the same can not be said for State Land. Therefore, these recommendations suggest a priority order for protecting State Land based on their natural and cultural resource value.



IMPORTANCE OF CONSERVING RESOURCES IN THE CIENEGA CREEK WATERSHED

PIMA COUNTY, ARIZONA, JULY 2000

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2. Background and Purpose of the Proposed Las Cienegas National Conservation Area

2.1 Background

The proposed Las Cienegas National Conservation Area is a practical and progressive response to natural resource and fiscal management issues in Pima County Arizona. Conservation of the resources in the area is an ideal that has broad public support and complements the goals of Pima County's Sonoran Desert Conservation Plan. Last September, Congressman Kolbe submitted a legislative proposal in the House of Representatives to establish the Las Cienegas National Conservation Area. The National Conservation Area legislation provides the opportunity to consolidate public ownership and management of the Cienega watershed and set specific management guidelines to ensure conservation of riparian and grassland ecosystems.

The origins of this proposal date back more than a decade. In 1987, Pima and Santa Cruz Counties urged the Arizona Congressional delegation to authorize the Bureau of Land Management (BLM) to acquire the privately-owned Empire-Cienega Ranch. Through subsequent land exchanges, the BLM acquired roughly 42,000 acres of deeded land and assumed management of another 57,000 acres of state grazing land.

The acquisition marked the beginning of a local effort to control urban sprawl, maintain open space through ranch conservation, provide for public recreation, and protect native plants and wildlife. Toward this end, Pima County established Colossal Cave Mountain Park and Cienega Creek Natural Preserve and acquired several adjacent ranches at a cost of approximately \$14 million. These acquisitions brought nearly 5,800 acres into public ownership, and included management of over 31,000 acres of State Trust land leased for grazing. Land ownership by public entities within the Pima County boundaries of the original concept map for the proposed National Conservation Area includes almost 37,000 acres of federal land (primarily Bureau of Land Management); about 89,640 acres of State Lands, and nearly 6,000 acres of County land.

2.2 Purpose of the Proposed Las Cienegas National Conservation Area

The proposed Congressional legislation will elevate the conservation status and establish a "Las Cienegas National Conservation Area." If enacted, it will be similar to the 1988 legislation which authorized the 56,000 acre San Pedro Riparian National Conservation Area in Cochise County.

The stated purpose for establishing the Las Cienegas National Conservation Area is to "conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, agricultural, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and value of the public land ... while allowing environmentally responsible and sustainable livestock grazing and recreation to continue in appropriate areas."

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3. Compliance Issues Related to the Proposed Chiricahua Leopard Frog Listing

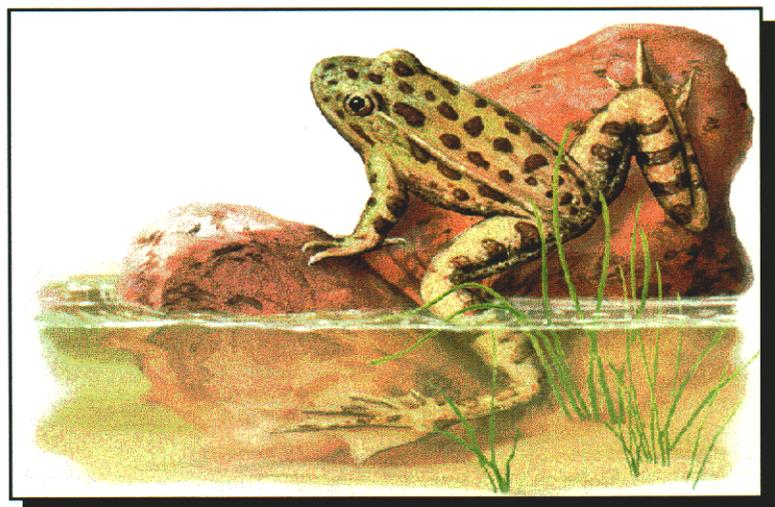
3.1 June 14, 2000 Proposed Listing

On June 14, 2000, the United States Fish and Wildlife Service published in the Federal Register notice of a proposal to list the Chiricahua Leopard Frog as threatened. The comment period for this proposal is open for six more weeks. Given the tenuous state of the population, listing is anticipated. The Chiricahua Leopard Frog inhabits cienegas, which are wetland communities found at elevations of 3,200 to 8,890 feet. In a comprehensive analysis entitled *Cienegas -- Vanishing Climax Communities of the American Southwest*, authors Henderson and Minckley describe cienegas as "aquatic islands of unique habitat in an arid-land matrix." The dewatering of cienegas and resulting habitat loss, in addition to predation and competition from non-natives such as bullfrogs, are known threats to the Chiricahua Leopard Frog, found now only in the Cienega-Rincon watershed, limited areas of the Upper Santa Cruz, and in stockponds in the Altar Valley area within Pima County.

The text of the proposed rule to list the Chiricahua Leopard Frog states that southeastern Arizona has been extensively surveyed so "it is unlikely that many additional new populations will be found there." (P. 37345) In some sites the frogs are limited to habitats such as stock ponds, where dry spells impact non-natives with more force, but leave the native Chiricahua Leopard Frog at risk too. The listing document states that: "stock tank populations are often quite small. Small populations are subject to extirpation from random variations The dynamic nature of stock tank habitats and the small size of the populations that inhabit them suggest that many of these populations are not likely to persist for long periods." (P. 37351)

Within the proposed rule, potential take is defined to include: "water diversions, groundwater pumping, water releases, or other water management activities that result in the displacement or death of eggs, tadpoles, or adult frogs; disruption of breeding activities; introduction of nonnative predators; or significant alteration of vegetation characteristics at or near occupied sites." A 4(d) rule is included which would exempt from Section 9 liability, take by livestock use or maintenance activities at stock tanks on private lands. This rule recognizes the importance of stock tanks to existing populations and at the same time confirms the dire state of the overall population. Consistent with the Ranch Conservation element of the SDCP, this rule aligns the incentives of the major stewards of the resource with the goal of conserving the species.

CHIRICAHUA LEOPARD FROG



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3.2 August 10, 2000 Study -- Aquatic Vertebrate Conservation in Pima County

Following the proposed rule to list the Chiricahua Leopard Frog as threatened, Pima County issued a report by Dr. Philip Rosen, a leading biologist in the area, entitled *Aquatic Vertebrate Conservation in Pima County*. Dr. Rosen outlines plans for conservation and restoration of native fishes, leopard frogs, Sonoran mud turtles, and garter snakes in Pima County in both the urban and ex-urban areas of Eastern Pima County. The report discusses the conservation potential of forty key canyons, identifying the presence of both native and non-native aquatic species, and suggesting specific actions ranging from removal of harmful exotics, to reintroduction of natives, to specific management prescriptions, to necessary partnerships and priority acquisitions.

The review of key canyons provides alarming insight into the numerous crashes and disappearances that have occurred recently in native frog and fish populations. Stabilizing the aquatic species in isolated canyons is obviously a condition of restoring urban populations. "Ideally," Dr. Rosen writes, "conservation strategies both inside and outside the urban environments of Pima County should look toward both preservation in mountain canyons and restoration of valley floors." (P. 15)

Highlights from the August 10th report relevant to the issue of protecting the Cienega Creek area include:

- **"Fishes:** Imperiled fishes in Pima County currently occur naturally at upper Ciénega Creek-Empire Ranch (Gila chub, topminnow, longfin dace), Sabino Canyon (Gila chub, and formerly, Gila topminnow), perhaps Buehman Canyon (Gila chub), and potentially in the Santa Cruz River at Arivaca Junction (Gila topminnow, Sonora sucker). Longfin Dace also occur in the County in lower Ciénega Creek, the northeast quadrant of the Santa Rita Mountains (Cave, Gardner, and Fish Canyons), the San Pedro River and some of its tributary canyons, and should be present in the Santa Cruz." (P. 13)
- **"Amphibians:** Lowland leopard frogs are abundant in the perennial stretches of the lower San Pedro and in lower Ciénega Creek (in the County's Natural Preserve). They also occur in the County in good numbers at about 7 isolated canyons in the Rincon, Santa Catalina, and Whetstone Mountains, and they are known in more limited numbers in about 4 additional, also isolated, canyons in these mountains. ...

It is quite possible that the lowland leopard frog may be re-discovered in or near the Altar Valley just north of Buenos Aires National Wildlife Refuge. Otherwise in southern Arizona, this species has been extirpated except at the Muleshoe Ranch Preserve, and two isolated springs, in the Atascosa and Pajarito mountains. Isolated populations of lowland leopard frog have been disappearing at an alarming rate in the mountains around Tucson--at least 6 major populations have disappeared in the last three decades. They have disappeared due to introduced species and short-term drying (2 or 3 cases), and will not be naturally re-established without supportive management." (P. 13)

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"Chiricahua leopard frogs now occur in the County only at Buenos Aires National Wildlife Refuge and vicinity (2 known populations), at Empire Ranch (1 known, tiny population persisting), and in the northern Santa Rita Mountains (where 2 small populations may or may not be persisting). They were formerly widespread and abundant at Arivaca, the Altar Valley, Sierra San Luis, northern Santa Rita Mountains, and upper Ciénega Creek, occurring widely in natural streams, springs, and stock tanks. Major population losses are attributable to exotic species. Both species of leopard frogs are also suffering from a possibly newly acquired disease." (P. 13)

- **"Reptiles** - The Mexican garter snake persists in the County in Ciénega Creek. It formerly occurred, and was presumably extremely abundant, at Arivaca and in all perennial waters of the Santa Cruz, Rillito, Pantano, and Agua Caliente in the Santa Cruz Valley and Tucson Basin. This species is dwindling toward eventual extinction in the United States".

- **"Cienega Creek Natural Preserve**, from Pantano to the railroad bridge. A well-known, major lowland leopard frog population site, and more recently with numerous records of the Mexican garter snake, this site is recovering from grazing. Under grazing, it was a desert stream with little pool development. Under protection as a county park, deeper and more stable pools have developed, and a ciénega-stream environment is apparently developing. Bullfrogs and non-native soft-shelled turtles were reliably reported at the site starting in about 1995. These and exotic fishes (currently present in clay pit ponds dangerously close to the stream) may do better in the new, more stable conditions, and may pose a significant threat. Clearly, the non-native fish near the stream should be removed. A thorough survey of stock tanks in the region surrounding this critical resource should be initiated. New pond developments in the Pantano floodplain at Vail Valley below the county park threaten to produce a bullfrog explosion that will inundate the leopard frog population in the Natural Preserve. ... State representatives should be contacted concerning the contradictory nature of state statute and Arizona Game and Fish Department's rules and attitude toward bullfrog possession and introductions. State legislative action is required before the bullfrog can gain its richly deserved status in Arizona--totally prohibited. Currently, it is legal to purchase bullfrogs out of state, and release them on private land. Without legislative action, the Arizona Game and Fish Department cannot correct this situation. A successful, reasoned argument from the SDCP will benefit the entire state. This site may well support a variety of native fish species, most notably the Gila chub and Gila topminnow, which are upstream in the Empire-Cienega Ranch reach of Ciénega Creek. Until very recently, the habitat in the Natural Preserve was shallow runs, with few pools, and unstable banks. Thus, chub and topminnow have probably not had time to recolonize the site. From the standpoint of future recolonization potential in the Tucson Basin, as envisioned in the present plan document, allowing natural downstream colonization processes would be more informative than immediate re-introduction of the species. Assuming the habitat is now suitable, it would be very strange if downstream colonization during floods did not occur, and confirmation would be important." (P 17)

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- **“Empire-Cienega Resource Conservation Area -- BLM (Empire-Cienega Ranch).** This is the wetland gem of Pima County, with lowland leopard frogs (rare or extinct), Chiricahua leopard frogs (now rare), bullfrogs (rare), Mexican garter snakes (apparently still widespread and probably not uncommon), Sonoran mud turtles (abundant), longfin dace (abundant), and Gila chubs and Gila topminnows (both superabundant). The excellent wetland management practiced by the Bureau of Land Management, with the cooperation of the grazing permittee, at this site should be recognized. Efforts to eliminate all stock ponds with breeding populations of non-native fish and bullfrogs in the entire basin should be assisted and pursued with vigor.” (P. 18)

- **“Keeping exotic fish, which have apparently somehow never gained access to Ciénega Creek, out of the system is perhaps the County’s highest priority for wetland conservation.** There are several million endangered fishes in the system--probably 1-2 orders of magnitude greater than the sum total of all other individuals of Gila topminnow in the U.S., as well as large numbers of Gila chub. Loss of the site through spread of mosquitofish, green sunfish, bass, and bullhead catfish could possibly eliminate the long-term survival prospects for these two fishes. Removal of the offending pond habitat proximal to the stream may make it difficult for bullfrogs to persist in the area, as well.” “The Chiricahua leopard frog and Mexican garter snake populations in Ciénega Creek are very important, and require study and monitoring. The Mexican garter snake population may be the best one left in the United States.” (P. 18-19)

- “Mountain Canyon refugia, and the all-important Empire-Cienega Ranch section of Ciénega Creek, must of course be protected from de-watering. Further, renovations in many of them are needed, specifically the removal of harmful introduced species. This document provides an annotated list of most of the major canyons that support aquatic species in the County. A major step in recovery of the valley floor will be the elimination of upstream, in-drainage populations of introduced species, which otherwise will regularly recolonize downstream areas we are attempting to manage, sharply foreclosing our options.” (P. 26)

- “In addition to detailing some aspects of these proposed restoration efforts, this document identifies and highlights some key immediate or important priorities: (1) The Empire-Cienega Ranch area must be protected from invasive exotic species, especially fishes, by getting the exotics out of the surrounding drainage basin; ... (3) A long-term solution should be sought (in cooperation with Buenos Aries National Wildlife Refuge and Arizona Game and Fish Department) to the disastrous situation at Arivaca Ciénega and Arivaca Lake, where non-native species have overwhelmed the Chiricahua leopard frog, Mexican garter snake, and Gila topminnow; (4) Pima County and the Sonoran Desert Conservation Plan should recognize and assist the development of cooperation between the Buenos Aires National Wildlife Refuge, Arizona Game and Fish Department, and area ranchers interested in conservation and re-establishment of native leopard frogs in ponds and springs in the desert grassland and oak woodland areas of the County.” (P. 27)

4. Relation of Las Cienegas to the Sonoran Desert Conservation Plan

Within this opening statement of the legislation for the proposed Las Cienegas National Conservation Area, each of the six elements of the Sonoran Desert Conservation Plan finds support, including (1) Corridor Protection for wildlife; (2) Protection of Critical and Sensitive Habitat; (3) Riparian Restoration and water resource protection; (4) Mountain Park and recreation goals; (5) Ranch Conservation; and (6) Historic and Cultural Preservation. Pima County has also analyzed land use and fiscal considerations as part of developing the Sonoran Desert Conservation Plan.

This section of the report summarizes data from the over 100 studies that have been undertaken to develop the information base for all elements of the Preliminary Sonoran Desert Conservation Plan, which will be issued next month. The Cienega-Rincon area, like the Altar Valley, has high natural and cultural resource value, and thus high conservation potential as a watershed planning unit.

4.1 Habitat and Corridor Considerations of the Las Cienega National Conservation Area

- **Habitat and Corridors Elements** -- A series of nineteen studies have been drafted to develop the regional biological evaluation of the Preliminary Sonoran Desert Conservation Plan.
- **In General** -- Preserving large blocks of suitable land and important wildlife movement corridors is necessary to maintain the present diversity of plant and animal life in the area. The BLM's acquisition of the Empire-Cienega Ranch in 1988 was a good start in this respect. BLM has, since then, substantially improved habitat conditions for several species of wildlife.

The southeast corner of Pima County plays an important role in the overall conservation plan. Traditionally, grassland in southern Arizona has been subject to extensive development, while mountainous land has been isolated in separate Coronado National Forest units, the so-called "sky islands." But many wildlife species, principally large mammals and birds, depend at some point in the year upon the availability of lower elevation plant communities lying outside National Forest boundaries. The uplands are habitat for grassland-dependent wildlife such as the Chihuahuan Pronghorn, Baird's Sparrow and Sprague's Pipit.

The Las Cienegas National Conservation Area, particularly if it adopts management goals that are adaptive and developed in a manner consistent with the Sonoran Desert Conservation Plan, will preserve wildlife movement corridors linking a number of mountain ranges to the Cienega Creek corridor and adjacent grasslands. The area involved also allows animals to take advantage of local variations in rainfall and elevation, and to respond to periodic fires.

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- Priority Vulnerable Species: A 300 page document entitled *Priority Vulnerable Species, Data Compilation and Synthesis* was submitted by the Recon Consulting team as part of the biological evaluation of the Sonoran Desert Conservation Plan. It provides a detailed description of plants and animals that are being considered by the Science Technical Advisory Team as potentially covered under the multi-species program. Organized by taxonomic group, the priority vulnerable species accounts include:
 - 9 mammals
 - 8 birds
 - 7 reptiles
 - 7 plants
 - 6 fish
 - 2 amphibians
 - Invertebrates

Two strong themes emerge when this compilation of species accounts is read together: one is the enormous importance of aquatic and riparian-based habitats to the majority of priority vulnerable species, and the other is the very bleak biological status of the riparian system.

- Summary of Priority Vulnerable Species by Subarea

The chart below combines the total number of priority vulnerable species from the categories mammals, birds, reptiles, amphibians, fish, invertebrates, and plants, and ranks the areas from most to least number of species within the area that need protection due to their imperiled status. Just as the Cienega-Rincon and Altar Valley have the highest percent of priority streams (described below), these two watershed planning units have the greatest number of priority vulnerable species.

WATERSHED SUBAREA	NUMBER OF PRIORITY VULNERABLE SPECIES
Altar Valley	31
Cienega-Rincon	29
Upper Santa Cruz	23
Middle Santa Cruz	22
Tortolita Fan	17
Western Pima County	17
Avra Valley	16
Middle San Pedro	16

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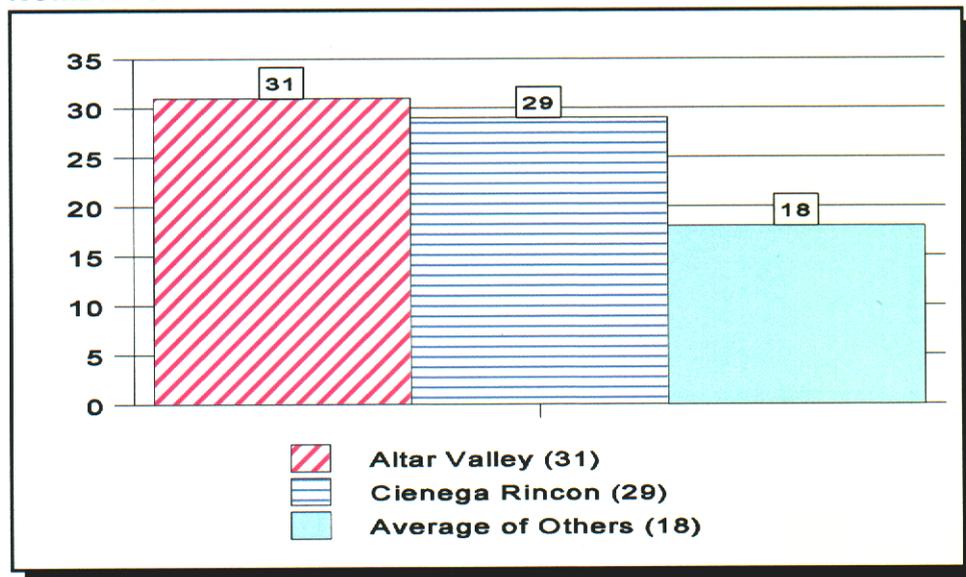
■ Summary of Priority Vulnerable Species by Taxonomic Group

The chart below shows the number of priority vulnerable species from each taxonomic group, with the Cienega-Rincon and Altar Valley subareas compared to the average of the other six watershed planning units.

<u>SUBAREA</u>	MAMMAL	BIRDS	FISH	AMPHIB	REPTILES	INVER T	PLANTS	TOTA L
CIENEGA-RINCON WATERSHED	7	7	3	2	2	5	3	29
ALTAR VALLEY WATERSHED	7	7	2	2	4	7	2	31
AVERAGE OF OTHER SIX WATERSHEDS	6	6	0.8	0.7	2.2	1.2	1.5	18

■ Source: *Priority Vulnerable Species*, June 8, 2000

NUMBER OF PRIORITY VULNERABLE SPECIES BY WATERSHED



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■ Priority Vulnerable Mammal Species

Nine mammals are considered to be priority vulnerable species. Seven are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

COMMON NAME	PRIORITY VULNERABLE SPECIES IN THE CIENEGA-RINCON SUBAREA?
Mexican long-tongued bat	yes
Allen's big-eared bat	yes
Western yellow bat	
Western red bat	yes
Lesser long-nosed bat	yes
California leaf-nosed bat	yes
Merriam's mouse	yes
Pale Townsend's big-eared bat	yes
Arizona Shrew	

A number of the bat species depend on, or occur along, riparian corridors. Riparian losses have had a negative impact on the Merriam's mouse, listed above.

CALIFORNIA LEAF-NOSED BAT



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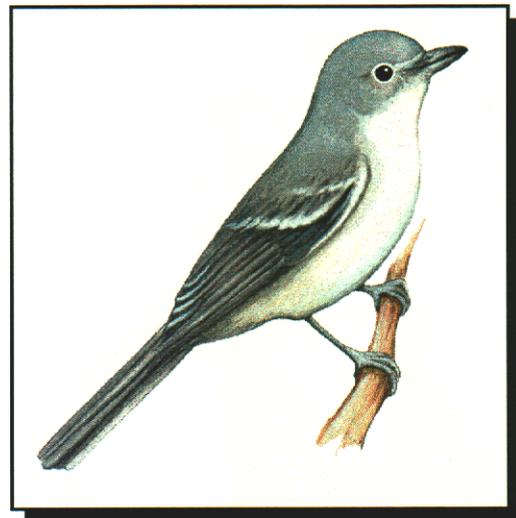
■ Priority Vulnerable Bird Species

Eight birds are considered to be priority vulnerable species. Seven are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

COMMON NAME	PRIORITY VULNERABLE SPECIES IN THE CIENEGA-RINCON SUBAREA?
Rufous-winged sparrow	yes
Swainson's hawk	yes
Burrowing owl	
Western Yellow-billed Cuckoo	yes
Southwestern willow flycatcher	yes
Cactus ferruginous pygmy-owl	yes
Abert's Towhee	yes
Bell's Vireo	yes

The report traces records back to the earliest naturalists in Pima County. Captain Charles Bendire's records from the 1870s along the Rillito are cited. Again, the importance of riparian habitat is a recurring theme in the species accounts. Six of the eight birds described in the text have an association with riparian areas. These areas have been seriously altered from baseline conditions and continue to decline.

BELL'S VIREO



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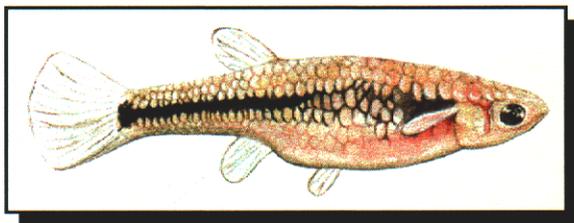
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■ Priority Vulnerable Fish and Amphibian Species

Six fish and two amphibian species are considered to be priority vulnerable species. Half of the fish and both amphibians are known or thought to be potentially present in the Cienega-Rincon watershed planning unit.

COMMON NAME	PRIORITY VULNERABLE SPECIES IN THE CIENEGA-RINCON SUBAREA?
FISH	
Gila topminnow	yes
Gila Chub	yes
Longfin Dace	yes
Desert Sucker	
Sonora Sucker	
Desert Pupfish	
AMPHIBIANS	
Chiricahua Leopard Frog	yes
Lowland Leopard Frog	yes

GILA TOPMINNOW



Like the status of Amphibians, the dire state of fish species reflects the state of our aquatic and riparian systems. As early as 1904, the mining, grazing and range practices of the day, combined with the presence of non-native fish, were identified by the aquatic biologist Frederic Morton Chamberlain as predictors of the demise of our aquatic systems. After surveying the area for native fish he concluded: "The only hope for fish in this region lies in pond culture." In reprinting the Chamberlain survey and reflecting on the further decline since 1904, Dr. W.L. Minckley provides this perspective: "Of the 16 native species Chamberlain caught, one is extinct and eight are listed as Threatened or Endangered by the U.S. Department of the Interior. Eleven also are formally listed by the Republic of Mexico, and most of the remainder are considered imperiled by state agencies or private conservation groups and may soon be proposed for listing." (*Chamberlain's 1904 Survey of Arizona Fishes*, J. of the Southwest)

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4.2 Riparian Protection Considerations of the Las Cienegas National Conservation Area

- Riparian Protection Element -- Sixteen studies form the basis of the riparian element of the Preliminary Sonoran Desert Conservation Plan. This section summarizes some of the findings from these reports.
- In General -- Depletion of water tables and surface water diversions have led to the loss of riparian habitat and to the precipitous decline in the populations of many species. A disproportionate number of extirpated native species are (or were) dependent on aquatic habitat which is now lost. Riparian habitat itself has been targeted by the Science Technical Advisory Team for protection under the Sonoran Desert Conservation Plan.

One report to the Team confirms the need for such attention; in answer to the question of what percentage of each vegetation community exists in public preserves, riparian habitat was found to be the most unprotected, with a range of 67 percent to 100 percent of the existing community lacking representation in the current system of public land preserves.

Threats to the riparian resources and wildlife community within the proposed Las Cienegas National Conservation Area include the following:

1. Much of the proposed National Conservation Area lies outside the Tucson Active Management Area (TAMA), wherein groundwater pumping is restricted and water conservation measures are required. Even within the Tucson Active Management Area, measures are not taken to conserve the shallow water tables upon which riparian areas depend.
2. The Desert Fishes Recovery Team, comprised of scientists from a variety of state and federal agencies, has listed Cienega Creek as its top priority for protection. The remnant cienegas and desert wetlands along this stream are home to the endangered Gila Topminnow and Huachuca Water Umbel as well as the Lesser Long-nosed Bat. The Chiricahua Leopard Frog, Gila Chub, and Yellow-Billed Cuckoo also occur within the proposed National Conservation Area. These are species which may soon become listed as endangered or threatened .
3. In general, mesquite woodlands, fish, frogs and cottonwood trees along Cienega, Davidson, Wakefield, Mescal and Agua Verde Creeks all depend on the presence of a shallow water table.

Potential benefits from the Las Cienegas National Conservation Area include at least that perennial stream segments could be protected and restored, and thus contribute to recovery of several species listed under the Endangered Species Act.

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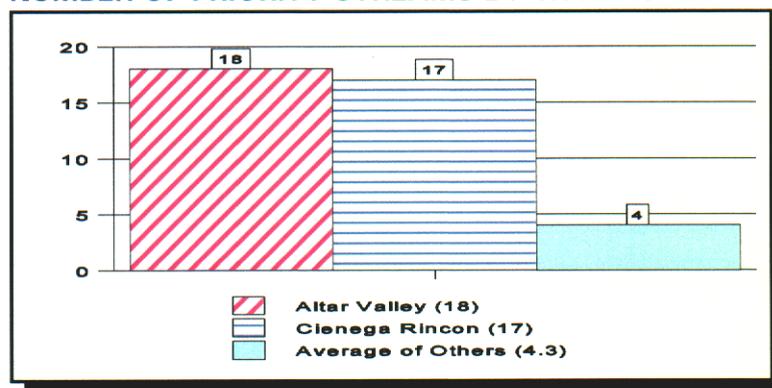
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- Prioritization of Streams for Conservation in Pima County** -- This report, issued on April 5, 2000, contributes to the Riparian Protection Element of the Sonoran Desert Conservation Plan by describing a number of streams within watershed planning units and prioritizing these streams according to their existing contribution to the overall conservation of biological diversity in Pima County. Streams that ranked in the top 20 by the following parameters are recommended for priority consideration: perennial stream length and intermittent stream length; area of hydro-mesoriparian vegetation and of xeroriparian Class A vegetation; area of shallow groundwater; and presence of native fish.

Over 50 percent of the priority streams within the County are found within the Altar Valley and the Cienega Rincon area.

SDCP Planning Unit	Number of Priority Streams	Percentage of Total
1. Middle San Pedro	8	12
2. Cienega Rincon	17	26
3. Upper Santa Cruz	3	4
4. Middle Santa Cruz	9.5	15
5. Tortolita Fan	5.5	8
6A. Altar Valley	18	28
6B. Avra Valley	2	3
7. Tohono Nation	1	2
8. Western Pima Co.	1	2
Total	65	100

NUMBER OF PRIORITY STREAMS BY WATERSHED



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■ Potentially covered species in need of riparian areas

Potentially covered species are those for which an incidental take permit might be sought under the Endangered Species Act. The potentially covered species thought to need riparian areas are summarized by subarea in the table below.

Common Name	Included in Cienega Rincon Subarea?
Mexican Long-tongued Bat	yes
Merriam's Mouse (Mesquite Mouse)	yes
Western Yellow Bat	
Allen's Big-eared Bat	yes
Western Red Bat	yes
Arizona Shrew	
Southwestern Willow Flycatcher	yes
Western Yellow-billed Cuckoo	yes
Cactus Ferruginous Pygmy-Owl	yes
Abert's Towhee	yes
Bell's Vireo	yes
Chiricahua Leopard Frog	yes
Lowland Leopard Frog	yes
Mexican Garter Snake	yes
Red-backed Whiptail Lizard	
Giant Spotted Whiptail	
Sonora Sucker	
Gila Chub	yes
Desert Pupfish	
Longfin Dace	yes
Gila Topminnow	yes
Desert Sucker	
Huachuca Water Umbel	yes

Critical habitat for certain riparian-dependent species has been designated by U. S. Fish and Wildlife under the Endangered Species Act.

Critical habitat for spikedace and loach minnow has been designated in the San Pedro River Valley.

Critical habitat for the ferruginous pygmy-owl also includes many riparian areas, the largest of which is the San Pedro River corridor.

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■ Native Fish and Frogs

Watercourses associated with existing or very recently extirpated populations of native fish and frogs are listed in the table below. The Cienega Rincon area far exceeds other subareas by this measure. This information was developed by Pima County by consulting experts knowledge, literature review and HDMS records.

Subarea	Stream Name	Native Fish	Leopard Frogs
1 San Pedro	Bullock Canyon	✓	✓
	Redfield Canyon	X	✓
	Edgar Canyon	✓	✓
	Youtcy Canyon	?	✓
	San Pedro River	✓	✓
	Buehman Canyon	✓	✓
	Espiritu Canyon	?	✓
	Bingham Cienega	?	✓
2 Cienega Rincon	Chiminea Canyon	?	✓
	Box Canyon	?	✓
	Gardner Canyon	?	✓
	Rincon Creek	✓	✓
	Agua Verde Creek	?	✓
	Paige Creek	?	✓
	Madrona Canyon	?	✓
	Empire Gulch	?	✓
	Wakefield Canyon	✓	✓
	Mattie Canyon	✓	✓
	West Sawmill Canyon	X	✓
	Fish Canyon	X	✓
	Unnamed Spring (#173)	?	X
	Cinco Canyon	?	✓
	Posta Quemada Canyon	✓	✓
	Nogales Spring	✓	✓
	Cienega Creek (lower)	✓	✓
	Little Nogales Spring	✓	✓
	Cienega Creek (upper)	✓	✓
	Box Canyon (Santa Ritas)	X	✓
Davidson Canyon	✓	✓	
3 Upper S.Cruz	Florida Canyon	?	✓

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Subarea	Stream Name	Native Fish	Leopard Frogs
4 Mid Santa Cruz	Bear Canyon	?	✓
	Tanque Verde Creek	✓	✓
	Sabino Canyon	✓	✓
	Molino Canyon	?	✓
	Railroad Wash	X	✓
	Ventana Canyon	?	✓
	Rillito Creek	X	✓
	Pantano Wash	X	✓
	Santa Cruz River	?	✓
	Agua Caliente Canyon	✓	✓
5 Tort. Fan	Alamo Canyon (Catalinas)	X	✓
	Romero Canyon	X	✓
	Cargodera Canyon	?	✓
	La Milagrosa Canyon	?	X
	Montrose Canyon	X	✓
	Lemmon Creek	X	X
	Canada del Oro	✓	✓
	Santa Cruz River	?	✓
6A Altar Valley	Fresnal Wash	X	✓
	Puertocito Wash	X	✓
	Oak Tree (Altar Valley)	X	✓
	Altar Wash	X	✓
	Canoa Wash	X	✓
	Arivaca Creek	?	✓
	Presumido Canyon	X	✓
	San Luis Wash	X	✓
6B Avra Valley	Cocio Wash	?	✓
	Brawley Wash	X	✓
8 Western Pima	Quitobaquito Pond	✓	X
	Alamo Canyon	X	✓

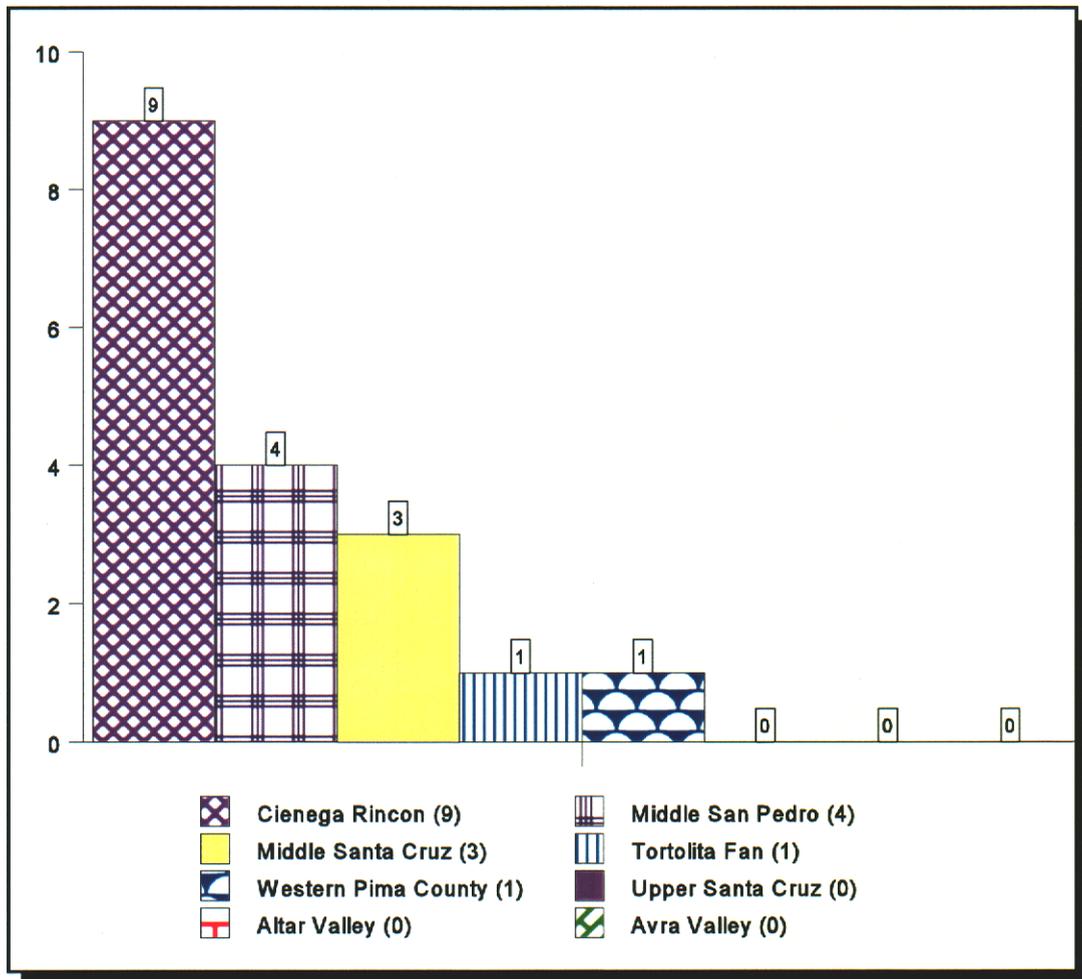
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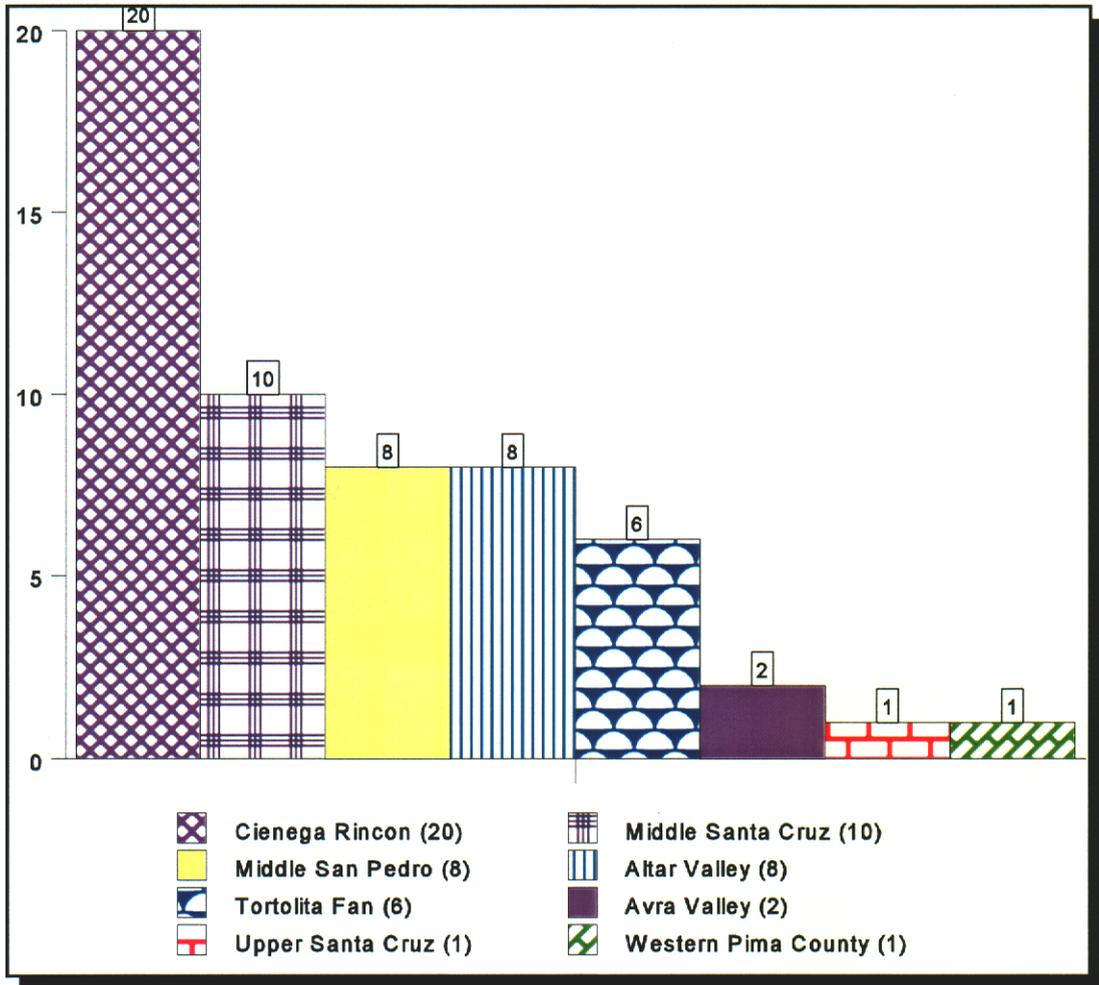
NUMBER OF WATERCOURSES PER SUBAREA KNOWN TO BE ASSOCIATED WITH EXISTING OR RECENTLY EXTIRPATED POPULATIONS OF NATIVE FISH



Summary

- Having 9 watercourses associated with native fish, the Cienega Rincon area has more than twice the number of any other watershed
-

NUMBER OF WATERCOURSES PER SUBAREA KNOWN TO BE ASSOCIATED WITH EXISTING OR RECENTLY EXTIRPATED POPULATIONS -- NATIVE FROGS



Summary

- Having 20 watercourses associated with native frogs, the Cienega Rincon area has more than twice the number of the second highest resource value watershed by this measure

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■ Groundwater pumping and surface -water diversions

Pima Association of Governments compiled information on groundwater withdrawals and surface water diversions near perennial streams, intermittent streams, and shallow groundwater areas previously identified by PAG for the SDCP.

Areas within the Cienega-Rincon watershed are presumed to have relatively high groundwater usage because of the large number of wells: Mud Spring, portions of Davidson Canyon, Gardner Canyon, upper Cienega Creek, portions of lower Cienega Creek and nearby Barrel Canyon.

Streams with known surface water diversions are Cienega Creek, the San Pedro River, and the Santa Cruz River. The perennial base flows of Cienega Creek and San Pedro River are diverted for golf course and pasture use, respectively.

■ Loss of floodplain function

In the urban periphery, continued loss of floodplain function is an additional future threat. Examples of areas where future structures may cause large losses of floodplain functions within the Cienega Rincon watershed include:

Proposed levees along Rincon Creek will reduce overbank flooding.

Bank protection and channelization is proposed for portions of Pantano Wash adjacent to Vail Valley.

Pantano Wash is the likely future source of aggregate for development in the area.

■ Comparing the watersheds to each other, the most imperiled river systems include:

Rincon Creek, where groundwater pumping for development may deplete a local aquifer which supports streamflow and gravel mining may increase channel downcutting;

Cienega Creek, where future groundwater pumping may deplete streamflow, where derailments along the railroad could contaminate the aquifer, and where non-native species could imperil the largest remaining Gila topminnow population.

Davidson Canyon, threatened principally by groundwater pumping and habitat loss. Future upstream mining could impair water quality.

■ Major opportunities for protection

Infrastructure planning in the metropolitan area could reduce water stress to Rincon Creek and Cienega Creek. Extension of reclaimed and potable water lines and substitution of reclaimed water for groundwater derived from these area is needed.

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4.3 Cultural Resource Considerations of the Las Cienegas National Conservation Area

- Cultural Resources Element -- Nineteen reports establish the preliminary cultural resource element. This section summarizes some of the findings from these reports.
- In General -- An analysis of the conservation potential of each watershed for cultural resources was conducted measuring four variables: sensitivity, integrity, legal protection and development threat. Among the Eastern Pima County watershed planning units, the Cienega-Rincon area rated second of seven subareas.

<u>RANK BY SUBAREA</u>	FUTURE THREAT	SENSITIVITY	LEGAL PROTECTION	INTEGRITY OF RESOURCE BASE	CONSERVATION POTENTIAL
SAN PEDRO	LOW	MED	HIGH	HIGH	1st of 7 subareas
CIENEGA RINCON	MED	HIGH	MED	MED	2nd of 7 subareas
AVRA VALLEY	MED	MED	MED	MED	3rd of 7 subareas
ALTAR VALLEY	MED	MED	MED	MED	3rd of 7 subareas
UPPER SANTA CRUZ	MED	MED	LOW	MED	5th of 7 subareas
TORTOLITA	HIGH	HIGH	LOW	LOW	6th of 7 subareas
MIDDLE SANTA CRUZ	HIGH	MED	MED	LOW	7th of 7 subareas

- Introduction -- This section presents information and analysis of current data on archaeological sites, historic resources and traditional cultural places within the subarea.

Archaeological research in the Rincon Valley area began in the 1920s with excavation at the Tanque Verde ruin, a late prehistoric Hohokam village site located south of Saguaro National Park Eastern District.

Between the mid 1960s and the early 1990s, the Saguaro National Park (then a monument) was the subject of multiple survey and follow up excavation projects that resulted in the discovery of hundreds of new archaeological sites along the hilly flanks of the Rincon Mountains.

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With the expansion of the Tucson metropolitan area to the south and east in the 1980s and 1990s, private development has also prompted archaeological survey in the Rincon Valley. The proposed Rocking K Ranch subdivision is the most notable example. Survey conducted between 1988 and 1996 has covered approximately 5800 acres of private and state lands during which 83 archaeological sites were recorded dating from the Late Archaic through to the end of the Hohokam sequence, a period covering approximately 4000 years. More recently, private development just south of Rocking K has identified another 25 sites on 1750 acres within the proposed Rancho del Lago subdivision, adding new data on prehistoric settlement along the Pantano Wash.

Between 1975 and 1982, archaeological investigation within the northern Santa Rita Mountains on the west side of the subarea revealed prehistoric uses of the uplands. A 23 square mile area of National Forest land was surveyed for the proposed Anamax-Rosemont land exchange, leading to the identification of 621 cultural manifestations dating to Archaic, Hohokam, and Historic Periods.

Excavation of 10 Archaic sites demonstrated ancient use of the highlands at least 7000 years ago.

The Cienega Creek itself has received its share of research attention beginning in the 1920s with investigations conducted by archaeologists from the University of Arizona. In the 1950s, survey and testing along the Creek identified pre-ceramic (Archaic) sites buried under the deep alluvium covering the Cienega Creek flood plain.

In 1982, a number of these ancient sites were excavated to investigate the origins of agriculture in prehistory.

More recently, beginning in 1995, a doctoral student at the University of Arizona surveyed thousands of acres along Cienega Creek and several of its tributaries. As a result, site counts have been increased to 554 for the subarea, representing a span of time from approximately 6000 B.C. to the present day. This effort confirms both the antiquity and the richness of Cienega Creek and its tributaries.

In sum, archeological survey and follow up research continues to demonstrates the importance of the subarea as a source of information on the past.

- **Site data:**

The following is a summary of archaeological data for the subarea that is presented by gross time period and site function. This analysis uses data from the Arizona State Museum, University of Arizona.

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Cienega Rincon Valley Subarea Archaeological Site Data by Site Function					
PERIOD	Prehistoric	Historic	Both	Unknown	Total
FUNCTION					
Agriculture	7	8	1	4	20
Art	2	1	1	5	9
Communication	0	1	1	0	2
Disposal	4	4	0	2	10
Government	0	5	0	0	5
Habitation	16	12	1	8	37
Resource Processing	29	6	1	22	58
Resource Procurement	9	5	1	12	27
Religion	2	0	0	0	2
Storage	1	0	0	0	1
Transportation	0	3	0	0	3
Unknown	133	8	5	53	199
Total	203	53	11	106	373

- Prehistoric sites outnumber the historic by four to one, and in a few cases, occupations from both major time periods are present on the same site. In all, Resource Processing, Habitation, and Resource Procurement, are the most common of the identifiable functions, indicating that residential needs, the acquisition of critical resources (either food or non-food items) and the processing of those resources were the primary activities in the subarea during both prehistoric and historic times. This is followed by Agricultural uses, Disposal (trash dumps) and Art (rock art) in order of their representation. The "Unknown" category consists of artifact scatters, such as pottery and stone chips, where function cannot be assessed. That so many components (199) have unidentifiable functions and cannot be accurately dated (106) is to be expected because the data presented here are collected during survey where only surface characteristics of sites are recorded without the benefit of subsurface excavation.

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Cienega Rincon Valley Subarea Prehistoric Archaeological Site Data by Time Period					
TIME PERIODS	PaleoIndian 12,000 B.C. - 8,000 B.C.	Archaic 8,000 B.C.- A.D. 200	Ceramic A.D. 200- A.D. 1540	Unknown	Total
Sites	0	20	84	99	203

- This table presents information on both the number of prehistoric components in the subarea as reported by the Arizona State Museum. New information not yet available to the Museum boosts the number of recorded Archaic sites to 142 and Ceramic Period sites to 281, marking a huge increase in site from both time periods but especially the earlier Archaic times. This period demonstrates that cultural deposits of extreme antiquity are present in Pima County. As a whole, the data presented here clearly indicate that portions of the subarea area in proximity to permanent water were heavily occupied throughout much of the prehistoric sequence. Missing from the prehistoric sequence is any evidence of occupation of the subarea during the PaleoIndian Period.

While no sites dating to the PaleoIndian Period have yet been reported in the subarea, four sites dating to this time period are known in the San Pedro River Valley to the east. The term "PaleoIndian" describes the earliest period of human occupation in the Americas. This was a time following the end of the last ice age when the environment was cooler and wetter than it is today.

Many species of now extinct animals including mammoth, horse, camel, bear, bison, and lions lived during this period. Numerous archaeological sites found in the west indicate that hunting these large animals was an important part of the subsistence of PaleoIndian people and as such archaeologists refer to them as "big game hunters." While very little is known about these people, it is believed that they lived in small groups or bands by hunting and gathering as food became seasonably available throughout the year.

Archaeological evidence suggest that they were highly mobile covering thousands of square miles in a year as they moved across the landscape. Early in the succeeding Archaic Period, the environment became warmer, the large game animals disappeared, and modern plant and animal species were established.

The Museum has records on 20 sites dating to the Archaic Period. The Archaic Period represent a time span of almost 8000 years during which human beings adjusted their way of living in response to new environmental conditions. In order to survive, people became generalists in their subsistence practices, hunting and gathering a wide variety of plants and animals and becoming more efficient in how they processed their food as indicated by the presence of grinding stones found on sites of this period.

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Again, people appeared to have lived in small groups by hunting a gathering wild plants and animals over large areas through a seasonal round. Sites from the early and middle parts of the Archaic are rare in southern Arizona suggesting low population levels in response to the unfavorable environmental conditions believed to exist at that time; however, toward the end of the period several significant changes occurred laying the foundation for subsequent cultural development.

First, the environment stabilized by 4500 years ago approaching modern conditions by that time.

Second, population levels appear to have increased and some evidence suggests that people roamed within more restricted territories as a result.

Third, by approximately 3500 years ago, people began to experiment with growing their own food as a supplement to their diet. This change also co-occurred with more permanent settlement along well watered reaches of the major drainages in the region.

- A total of 84 sites dating to the Ceramic Period in prehistory are known within the Cienega Rincon Valley subarea. The sheer number of sites and site components dating to this period in prehistory indicates that the subarea was strongly favored by ceramic period populations. The Ceramic Period covers the time between the adoption of ceramic technology in the third and fourth centuries after Christ to the end of the prehistoric sequence around A.D. 1540.

It was during the early part of the period, between approximately A.D. 200 to A.D. 700, that Archaic Period populations completed the transition from mobile hunting and gathering to settled, village based, agricultural existence in southern Arizona and elsewhere. The principal pottery bearing people in the region during prehistory were the Hohokam, who emerged as a distinct culture in the eighth century and dominated central and southern Arizona until around A.D. 1450.

The Hohokam flourished along the river valleys of southern Arizona but were also well adapted to the desert lands to the west. They lived in settled, permanent villages, grew their own food using irrigation and dry farming techniques, developed a rich ceremonial life, and traded extensively with their neighbors throughout the region.

A period of environmental instability during the A.D. 1300s is believed have weakened the agricultural economy to the point where the Hohokam were no longer able to produce food in sufficient quantities and with enough consistency to support large populations and the culture collapsed around A.D. 1450.

Following the collapse of the Hohokam, the region is believed to have been occupied in very low numbers by an O'odham (upper Piman speaking) people whose settlement and subsistence practices reflect a return to an earlier, simpler way of living.

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Life continued to involve the cultivation of crops supplemented by hunting a gathering, but the level of technical sophistication and social and religious cohesion characteristic of the Hohokam is missing in these later populations. These people are believed to be the descendants of the Hohokam, but are recognized as separate culture groups. Archaeologists know very little about the period that represents the end of the Hohokam and the beginning of the Spanish Colonial presence in southern Arizona. It appears to have been a time of flux when the vacuum left by the disappearance of the Hohokam was filled by groups that the Spanish recognized as the Sobaipuri and the Tohono O'odham in the 17th and 18th centuries. No components dating to late prehistoric times are known in the Cienega Rincon Valley subarea.

Cienega Rincon Valley Subarea Historic Archaeological Site Data by Culture Group			
Euro-American	Native American	Unknown	Total
32	1	20	53

- This table presents archaeological data on the Historic Period, spanning the years between A.D. 1540 and 1950. European settlement of the Cienega Rincon Valley subarea dates from the latter half of the 19th century. New survey data pushes the total number of sites from the Historic Period to 77, although no breakdown is available as of yet. Trails existed over the Rincon Mountains and the Cienega Creek was used since Spanish Colonial times to connect the Tucson area with the San Pedro River Valley. The Mormon Battalion, for instance, constructed a wagon road through Cienega Creek in 1846. While several early ranches were established in the eastern Tucson Basin as early as the 1860s, large scale ranching in the area did not begin until the 1870s. Several notable examples include the Empire Ranch, the Cienega Ranch, and the Tanque Verde Ranch. Smaller ranches and farmsteads were established during the 1870s, but it was the coming of the railroad in 1880 and the cessation of Apache hostilities in 1886, that opened the area up to new settlement. The largest settlement in the eastern Tucson Basin was at Pantano, founded in the early 1880s by the Southern Pacific Railroad company; it was abandoned in the 1950s. Historic use of the Rincon Valley in the 1880s and 1890s involved homesteading and ranching, with dairy farming, woodcutting, and quicklime production being the focus of economic activity.

The Cienega Creek saw the San Antonio and San Diego Stage Company pass through it in 1857 and the succeeding Butterfield Overland Mail line in 1859. Freight from Messilla New Mexico was carried through the valley in the 1860s and 1870s. Ranches, such as the Empire ranch mentioned above, were established in the Cienega at this time along with others in the area including the Sanford, Kane and Gardiner Ranches, all of which were absorbed during the 1880s and 1890s by the expansion of the Empire ranch. Mining, while not an important activity in the lower Cienega, occurred along its western margins in the Empire and Santa Rita Mountains, and communities associated with these enterprises also flourished for a time before disappearing from the valley in the early 20th century.

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A total of 32 Historic Period sites have been identified in the subarea by the Arizona State Museum. Twelve of these are Habitations, six are Resource Processing (mortar/metate, roasting pit, kiln, ore processing, etc), two are transportation (roads, trails, stage stops, etc.) related features and three are related to government (public buildings, park, plaza, big house, etc.). Four historic Native American occupations have also been identified, three of which are believed to be Tohono O'odham. There are also two components that could not be securely identified as to cultural affiliation. The low numbers of components dating to the historic time period is probably a reflection of research bias and not a lack of resources dating to this time period. Recent research in the area conducted within the Cienega Natural Preserve and to the south along Cienega Creek confirms this observation. Sixty-five Historic Period sites have been newly recorded including several identified as Sobaipuri and Apache in origin. Also recorded were the remains of ranches (Empire, Gardiner, O'Leary, Hopley and Kane), historic towns (Greaterville and Pantano), mines (Total Wreck) historic travel routes (Butterfield Stage Line and Southern Pacific Railroad) and historic road alignments (State roads 83 and 88).

■ Historical Resources

Definition: "Historical resources are sites, districts, structures, objects, or other evidences of human activities that represent facets of the history of the nation, state, or locality. Also places where significant historical or unusual events occurred even though no evidence of the event remains, or places associated with persons significant in our history that have gained importance in the last 50 years" (Preserving Cultural and Historic Resources, Pima County, May 1999).

Historical resources are largely constructed or engineered elements of the built environment including buildings used for residential purposes, such as houses, but also commercial stores, industrial facilities, civic centers, and places of worship. Roads, bridges, irrigation canals, mining works, and railroad tracks are also historical resources. Information on these places is recovered through drawings and design plans, photographs, maps, surveys, and personal recollections.

The Cienega Rincon Valley subarea has a number of places of historic importance including occupied historic communities, abandoned settlements or ghost towns, places that have been recognized for their historic value and registered on the National Register of Historic Places, and a historic trail.

■ Historic communities

The town of Vail, Arizona, is located south of Pantano Wash and adjacent to the southern Pacific railroad line. The community owes its existence to the railroad and was originally a station along the line between Tucson and El Paso beginning in 1881. The Southern Pacific Railroad received permission to cross ranch land owned by brothers Walter and Edward Vail in 1880, hence the name of the settlement.

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This station was located between the Empire and Rita stations on old maps of the area. By 1883, a post office was opened in nearby Pantano, now a historic archaeological site. Today, Vail continues to exist as a small settlement in a rapidly growing area (Excerpted from "Arizona's Names" by Byrd Howell Granger, The Falconer Publishing Company, 1983)

■ Ghost Towns:

Many historic communities developed, even thrived, only to be abandoned. These places were typically mining towns, or in some cases, milling towns, that boomed until economic forces eliminated the reason for their existence. Established during the later part of the 19th century and early 20th century, these places remain time capsules that reflect a by-gone era. The following descriptions are excerpted from "Ghost Towns of Arizona" by James E. and Barbara H. Sherman, University of Oklahoma Press, 1969.

Greterville

The discovery of placer gold in the foothills of the Santa Rita mountains in 1874 sparked the creation of the Greterville Mining District. Within a few years, hundreds of miners settled in the village of the same name. Mining continued until the gravel bearing deposits were depleted in the 1880s. In its hey day, the town offered several dance halls, saloons, shops, and in 1882 a school opened. The post office opened in 1879, closing in 1946. Mining at a much reduced level has continued off and on and a small number of families still occupy this once bustling community.

Rosemont

Starting in the 1870s, copper ore was pulled from the Santa Rita Mountains at Rosemont camp, a small community located in the southwest corner of the subarea. In its day, Rosemont supported 150 people, had a school, a hotel, and some stores. Mining continued for several decades before the mines closed down and the community was abandoned. The post office opened in 1894 and closed in 1910.

Total Wreck

In 1879, silver/lead ore was discovered in the Empire Mountains. Named after the appearance of the hill in which the deposits were found, Total Wreck began mining operations in 1881 after the arrival of the railroad. By 1883, there were two hundred residents, fifty houses, three stores, three hotels, four saloons, a butcher shop and a lumber yard. By the end of 1884, the mine was closed. The post office opened in 1881 and was closed in 1890.

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■ National Register properties:

The National Register of Historic Places was created as a part of the National Historic Preservation Act of 1966. It is the nation's premier honor roll for places deemed of national, regional, or local historic importance. The criteria for listing include: a) association with a person who has contributed to history; b) association with an event important to history; c) associated with the work of a master artist or craftsman or typical of a style or type of workmanship; d) yielding or having the potential to yield information important to history or prehistory. Listing in no way effects the rights of private property owners to do what they wish with their property. Federal agencies; however, are required to consider the effects of their actions on listed properties. The following descriptions are excerpted from the individual National Register nomination forms available at the State Historic Preservation Office in Phoenix, Arizona.

Empire Ranch

The Empire Ranch is located among rolling grasslands adjacent to the Empire Gulch, an intermittent stream in the middle of the Cienega Valley. Started in 1876 as 160 acre holding, the ranch became one of the largest in the west eventually covering an area 60 miles north/south by 30 miles east/west stretching from the Rincon Mountains to the Mexican Border. Owned initially by a number of men, the ranch was bought in 1881 by Walter Vail, after which the town of Vail is named in part (see above). Vail expanded the ranch in the mid 1880s, taking time to also serve in the territorial legislature and on the Pima County Board of Supervisors. Vail was killed in a street car accident in Los Angeles in 1906. The adobe ranch house was listed on the National Register of Historic Places in 1975.

Cienega Bridge

The Cienega Bridge was built in 1921 as part of the Borderland Highway project across southern Arizona. The bridge is a concrete and reinforced steel structure designed as a medium-span concrete arch with a two-span concrete girder viaduct over a branch of the Southern Pacific Railroad. It was one of three virtually identical open-spandrel concrete arches that were built in Pima, Pinal, and Yavapai counties, although the Cienega bridge was the longest with a span of 146 feet. The bridge was nominated to the National Register for its significance to local transportation history and placed on the National Register of Historic Places in 1988.

Colossal Cave Historic District

Discovered in 1879, by a local ranch hand looking for stray cows, Colossal Cave consists of 39 miles of subterranean caverns and connecting tunnels, two miles of which are currently open to the public. Attempts to develop the cave for public access began in earnest in 1917 and by 1922 a formalized trail system was in place.

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Between 1934 and 1937, the Civilian Conservation Corps occupied a portion of the nearby Posta Quemada cattle ranch, and implemented an ambitious plan to upgrade and expand the visitor's facilities. The results transformed Colossal Cave into a modern tourist destination. Of note is the visitor's center, a two-story building of southwestern vernacular design constructed from shaped stone quarried from the local hillside. Other facilities built by the CCC include picnic and barbecue areas, rock walls, paths and footbridges, as well as the trail and lighting system in the cave itself. These historic features and those of the Posta Quemada Ranch complex were nominated as a historic district for their tourism, educational, and ranching themes and placed on the National Register of Historic Places in 1992. The cave is now a part of Pima County's Park system and is open to the public.

Kentucky Camp Historic District

Located on the Coronado National Forest, the Kentucky Camp Historic District includes buildings, structures, and archaeological sites relating to hydraulic placer mining in southeastern Arizona. Kentucky Camp was constructed as the headquarters of the Santa Rita Water and Mining company which was founded in 1902 to revitalize the worked-out Greaterville gold placers with intensive hydraulic mining. Despite its ambitious scale of operations, the endeavor proved an economic failure and closed in 1906. The District includes elements that together represent the system of hydraulic mining employed at the Kentucky Camp. The site was nominated to the National Register of Historic Places because of its association with early 20th century mining technology and listed in 1995.

Rincon Mountain Foothills Archaeological District

The Rincon Mountain Foothills Archaeological District is located within the Saguaro National Park Eastern District. The nomination was prepared as a result of multiple archaeological surveys that were conducted in the Park from the mid 1960s to the late 1970s. These efforts resulted in the discovery of 110 historic and prehistoric archaeological sites dating from the Archaic, Ceramic (Hohokam) and Historic Periods within a 25 square mile area, making it the largest property listed on the National Register in the subarea. The District was listed in 1979.

Upper Davidson Canyon Archaeological District

This district is a by-product of a proposed land exchange in the Coronado National Forest in the mid 1970s that required survey of approximately 23 square miles. The Davidson Canyon portion of that survey proved so rich in archaeological sites, that in 1980 it was excluded from the proposed land exchange and set aside for listing on the National Register. A total of 29 prehistoric sites dating from the Archaic and succeeding Ceramic (Hohokam) Period are included within 1300 acres. The district was listed in 1992 for its potential to yield information important to understanding prehistoric use of the upland areas in southern Arizona.

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■ Historic Trails

Butterfield Stage Line

The Butterfield Overland Company was one of the first continental mail carriers. It opened in 1858 connecting St. Louis, Missouri and San Francisco, California; however, by 1861 it had ceased operations. In Arizona, the company used parts of existing trails to forge a route some 437 miles in length. In 1869, Wells Fargo operated over the old Butterfield stage lines and in the 1870s, the Southern Pacific railroad surveyed along the approximate route. In the Cienega Rincon subarea, the trail followed the south side of Cienega Creek for most of its length, crossing to the north to follow Mescal Arroyo. Vestiges of the Cienega Creek stage stop, located adjacent to the creek in the vicinity of Marsh Station Road, still exists (excerpted from "Retracing the Butterfield Overland Trail Through Arizona," by Gerald T. Ahnert, Westernlore Press, 1973).

■ Rural Historic Landscapes:

There may also be individual ranches or farmsteads within the subarea that qualify as having importance to the history of the settling of the Cienega Rincon Valley subarea.

Some of these may be part of larger historic landscapes that are recognizable entities that have historic value. Historic Landscapes a special subcategory of historic resources. As defined by the National Park Service, a rural historic landscape is "that portion of the exterior natural environment that has been modified, influenced, or given special cultural meaning by people who shaped the landscape to serve human needs. A rural historic landscape is a geographical area that historically has been used by people or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways and natural features. Historic landscapes may reflect the beliefs, attitudes, traditions, and values of these people." The most likely candidates for places with these values in the subarea are ranches where the connection between historic ranch properties, ranch lands and ranching as a traditional activity remains intact. Examples where these connections may still be demonstrated are the Empire Ranch, the Empirita Ranch and the Posta Quemada Ranch.

■ Traditional Cultural Places

Definition: "A traditional cultural place is a historic site or district that is important because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. The traditional cultural significance of an historic property is derived from the role the property plays in a community's historically rooted beliefs, customs, and practices" (Preserving Cultural and Historic Resources, Pima County, May 1991).

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Pima County has been occupied by indigenous peoples for thousands of years and the modern descendants of these prehistoric cultures still live in the region today. All of Pima County is claimed as ancestral lands by the Ak-Chin Indian Community, the Gila River Indian Community, and the Tohono O'odham Nation. The Tohono O'odham claim direct ancestral affiliation with the prehistoric Hohokam Indians who inhabited much of southern and central Arizona. Places of traditional cultural value, as defined, are special to the community and must often remain secret to non-members; this is particularly true among Native Americans. These might be places where in the past natural resources were collected for ceremony or where natural features on the landscape are still recognized as having significance. Other places with traditional cultural value of particular importance to Native Americans are rock art sites and all archaeological sites containing human graves. Two of the sites within the subarea are identified as prehistoric rock art localities, and an additional 16 more were used for habitation purposes, which often contain human graves. It is reasonable to assume, that Native Americans would identify these places as having traditional cultural value. Again, recent survey information suggests that many more places with these kinds of values may exist in the Cienega Creek area.

- Data are presented in the table below showing the number of archaeological components by land status and degree of legal protection for cultural resources.

Cienega Rincon Subarea Archaeological Sites by landownership and legal protection		
Jurisdiction	No. of Archaeological Sites	Protection Status/Level
BLM	12	Protected/high
National Forest Lands	61	Protected/high
National Parks/Monuments	117	Protected/high
State Lands	41	Protected/moderate
County owned Lands	30	Protected/moderate
Private Lands	100	Unprotected/low
Total	361	

A total of 191 of the 361 sites have high protection status, reflecting the high percentage of federal lands in the subarea (37.8%), but also the effort that has been made by the federal agencies to identify cultural resources on these lands. Seventy-one sites are moderately protected from public and private actions, 30 of which are within county park lands at Colossal Cave or are located within Pima County's Cienega Creek Natural Preserve. The remaining 100 sites have low protection status. Since state lands can be sold for development, and private lands are subject only to local zoning, 141 of the 361 known archaeological sites may be affected by future development in the subarea. Furthermore, since the majority of the land base in the subarea has never been archaeologically surveyed, potentially hundreds, even thousands of sites that exist but have never been recorded could be affected.

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■ Resource Loss:

Relatively low levels of public and private development have occurred in the Cienega Rincon Valley subarea, with the exception of residential growth north of I-10. The presence of the Saguaro National Park on the northern margins of the subarea area, the listing of six National Register properties, combined with the creation of parks (Colossal Cave), preserves (County Natural Preserve) and conservation areas (Empire-Cienega), have contributed to a greater sensitivity towards natural and cultural resources conservation in the Cienega-Rincon subarea.

■ Resource Threat:

The greatest area of threat continues to be in the north and west of the subarea where large scale platted communities are being constructed. Subdivision housing and the construction of public infrastructure is occurring and will continue to occur in this area as the Tucson Metropolitan area pushes to the south and east. Potentially hundreds of archaeological sites and other cultural resources will be affected. The fact that private land can be subdivided and developed without platting under current state law, and that state trust land is vulnerable to sale for the highest and best use, increases the potential for resource loss in the future. On the southern end of the subarea, development pressures are far less intense and thus less of a threat to cultural and historical resources.

- Summary: Despite the limited degree of archaeological survey coverage, what information has been collected demonstrates that over 10,000 years of human history is well represented in the Cienega Rincon Valley subarea enhancing its importance as a place with high scientific and educational value. The town of Vail is a historic community with potential archaeological and architectural assets. Three ghost town sites important to the history of mining occur within the subarea and six places have been listed on the National Register of Historic Places for their importance to the history and prehistory of the region. The subarea also contains one of the few historic trails used to open the West. Native American claims identify the Cienega-Rincon Valleys as part of their traditional use areas and the possibility that places with traditional cultural value exist in the subarea is high, especially those places associated with the archaeological record. The subarea has rich cultural and historical resource values that will only increase as more data are collected. Since the majority of the Subarea is composed of state trust lands, and since these lands are potentially convertible into private lands for development, there is a further need to identify cultural and historical resources, evaluate their significance, and where warranted protect them for future generations.

- To this end, it is worth noting that the proposed National Conservation Area now before Congress is sufficient in size and scope to encompass most of the predicted high sensitivity areas for cultural resources and would thus extend a measure of protection for these resources in a manner that is consistent with the goals of the Sonoran Desert Conservation Plan.

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- Consistency in the analyses identify the Altar Valley, Empire-Cienega Valley, Upper Santa Cruz Valley, and San Pedro Valley as the subareas where ranching comprises a significant land use, and their capacity and stability suggest the best potential for sustainable ranch use. It is therefore concluded that ranchlands in these valleys have the best potential to define the urban boundary, where developing lands at the urban edge give way to natural open space. The future of State Trust land grazing leases will continue to be a key to ranch conservation.
- Introduction:

The Empire-Cienega Valley was historically one of the most significant ranching valleys in eastern Pima County. Today it remains largely rural, and is characterized by significant unfragmented expanses of natural open space, comprised principally of ranchlands and public preserves. Once threatened by massive development, the potential for the valley to retain its natural open space and ranching tradition is today greatly enhanced by efforts by Pima County and Santa Cruz County and the Bureau of Land Management to consolidate public ownership of the Empire-Cienega Ranch for conservation purposes.

Proposed for development in 1969 by the Gulf America Corporation (GAC), the Empire-Cienega ranches then comprised about 90 square miles in Pima and Santa Cruz counties, which GAC proposed to develop into a "satellite community" for a population of 180,000 residents. Concerns about impacts to ground-water, transportation, services, and environmental impacts resulted in one of Pima County's biggest development battles, with ranchers and environmentalists joining together in the opposition. Although portions of the Empire Plan were approved, no construction was begun, and the bankruptcy of GAC forced the sale of the Empire and Cienega ranches. These were purchased by Anamax Mining Company, which abandoned the GAC plans and later put the ranches up for sale. In 1986, Pima County contemplated acquisition of these ranches as floodprone lands to assist in controlling downstream urban flooding problems and to conserve ground-water. In 1988, through subsequent land exchanges, the BLM acquired roughly 42,000 acres of these deeded lands and assumed management of another 57,000 acres of state trust grazing lands that it manages as a resource conservation area and leases to local ranchers for livestock grazing.

Farther downstream in the Empire-Cienega valley, Pima County established Colossal Cave Mountain Park and Cienega Creek Preserve and acquired the nearby Posta Quemada and Empirita ranches, which are also leased as working cattle ranches. The acquisition of these ranches by BLM and Pima County marked the beginning of local efforts to control urban sprawl, maintain open space, continue sustainable ranching, allow public recreation, and protect cultural and natural resources.

Because of the valley's unique environmental qualities, including two of southern Arizona's perennial streams, the Secretary of Interior visited the Empire-Cienega Resource Conservation Area in January 1999 to consider the effort to establish a National Conservation Area (NCA).

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Since that time, Congressman Jim Kolbe and his staff have been working with the community and the Sonoita Valley Planning Partnership to develop legislation to establish the Las Cienegas National Conservation Area. This legislation (HR 2941) was introduced on September 24, 1999. If approved, the Las Cienegas NCA would protect more than 300 square miles, some 200,000 acres, in the Cienega Creek and Babocomari River watersheds, while allowing responsible and sustainable livestock grazing and recreation to continue. As a consequence of these actions by Congressman Kolbe, the BLM, Pima County, Santa Cruz County, and local residents, a significant portion, some 63 percent of the land area of the Empire-Cienega Valley is likely to be conserved for its natural and cultural values and open space, while providing a working landscape for ranching and livestock grazing.

■ Historical Summary:

The initial occupation of the valley by the prehistoric Archaic peoples dates perhaps as early as 8500 B.C., and while there are no Paleoindian occupation sites that have been identified, Paleoindian use of the valley perhaps as early as 10,000 B.C. is suggested by the presence of at least one isolated Clovis projectile point found in the eastern edge of the Santa Rita Mountains. More than 600 archaeological and historical sites have been found in the Empire-Cienega valley, dating to the Archaic, Early Agricultural, Hohokam, Protohistoric and Historic periods. A substantial number of these sites date to the Archaic period, followed by the Hohokam who occupied villages and smaller hamlets from about A.D. 300 to 1450 and farmed along the Cienega Creek floodplain and near spring sites in the adjacent mountains. Following the Hohokam collapse, 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. Arriving about the same time as the Spanish, the Apache, too, frequented southeastern Arizona, which later became part of the homeland of the Chiricahua Apache.

With the acquisition of this region by the United States following the 1854 Gadsden Purchase, some of the first Americans to enter the area were prospective miners in search of gold and silver. Lured to the region by Spanish accounts of rich ore bodies and the discovery of gold and silver elsewhere in southern Arizona, prospectors staked numerous small claims in the Santa Rita and other nearby mountain ranges; however, because of increased Apache raiding, mining, ranching, and agriculture in the Empire-Cienega valley was nearly precluded until after the Civil War. Settlement of the Empire-Cienega Valley with miners, homesteaders, and ranchers began in earnest in the 1870s when mines were re-opened and new mines developed and ranches were established under the Homestead Act of 1862 and the Desert Land Act of 1877. In 1874, the Greaterville gold placers were located, and by the late 1870s copper was being exploited at Helvetia, Twin Buttes, Silverbell, and elsewhere. The first mine in the Rosemont area was the Narragansett in 1879. With the coming of the railroad through the northern part of the valley in 1880, miners and ranchers were able to ship ore and livestock to distant markets, further encouraging the development of mining and ranching in the valley.

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The Empire-Cienega Valley is bounded by Saguaro National Park - East on the north, the Cochise County line and the Whetstone Mountains on the east, the Santa Cruz County line and the Sonoita area on the south, and the Santa Rita Mountain Range and the Empire Mountains on the west. The Empire-Cienega Valley watershed reflects a significant range in elevation from 2848 to 8596 feet. As with much of the Basin and Range province of the greater Southwest, the rugged mountain terrain and river valley support a variety of environmental zones and vegetation types, ranging from the Cienega Creek floodplain to higher elevation evergreen forests of the Santa Rita, Rincon, and Whetstone mountain ranges that surround the valley. Much of the valley is characterized by a broad, gently sloping bajada that accommodates broad expanses of grasslands that extend into the foothills of the surrounding mountain ranges.

Because of the range in elevation, rainfall, too, is highly variable ranging from about 13 inches annually at the lowest elevations to an estimated 31 inches at the highest elevations. Most of the rainfall in this watershed is estimated to average about 15 - 23 inches annually. This amount of rainfall covers nearly 92 percent of the subarea acreage.

■ Land Base & Land Uses:

Nearly all of the Empire-Cienega Valley subarea is located in unincorporated Pima County, except for the northwest portion of the subarea largely to the west of Pantano Wash, which has been annexed into the City of Tucson. The balance of the watershed, like much of Pima County, is comprised of a mosaic of land ownership including federal, state, and private lands, and a significant portion of this land is publicly owned. Approximate acreages are provided below for each kind of ownership.

Table 3. Land Ownership & Jurisdictions in the Empire-Cienega Valley

National Forest	53,715 acres	16.8 percent
National Parks	30,866	9.7
Pima County	5,910	1.8
BLM	36,741	1.5
State Lands	125,584	39.4
Private Lands	65,703	20.6
Unknown	<u>16</u>	<u>0.0</u>
TOTAL	318,535 acres	99.8 percent

Vail, Mescal, and Sonoita in Santa Cruz County are the principal settlements in the Empire-Cienega Valley watershed, and the total population in the entire valley is currently estimated at only 3,312 people. Private lands, comprising some 21 percent of the land base, are located throughout the valley. While some 48 percent of these private lands, 31,398 acres, are classified as used for ranching or agricultural purposes, some 52 percent, 34,305 acres, of all private lands are categorized as non-agricultural lands.

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A significant area of these non-ranching private lands characterizes much of the northwest portion of the subarea within and adjacent to the City of Tucson boundary and the Interstate 10 corridor. This area, which is experiencing urbanization from the Tucson metropolitan area, essentially marks where the transition from ranching to real estate development is occurring. Some of these lands such as the Rocking K and Vail Valley Ranch Specific Plan areas have been zoned for high density development and formally platted, and other areas in the valley reflect both formal subdivisions and lot-splitting or wildcat subdivision areas.

Elsewhere in the Empire-Cienega Valley, clusters of private lands that are not used for ranching are found to the east of Highway 83 and northwest of the Empire Mountains in the area to the south of the interchange at I-10 and Highway 83. Other clusters occur near Mescal along the I-10 corridor and to the south of the Whetstone Mountains. There are a total of 5704 parcels and 41 subdivisions recorded with the Pima County Assessor's Office. Platted subdivisions cover some 7209 acres.

■ Ranches:

It was not until the Gadsden Purchase of 1854 that the Empire-Cienega Valley experienced its first significant wave of immigrants who were largely American mining prospectors; however, permanent settlement of the region did not occur until after the Civil War.

With the establishment of the Butterfield Stageline and later the Southern Pacific Railroad in 1880 across the northern portion of the valley, the Empire-Cienega Valley became more easily accessible for exploration and settlement.

With the success of the Empire Ranch and local silver, gold and copper mines at Greaterville, Total Wreck, and Rosemont, the rail stop at Vail provided rail access to ranchers and miners who could ship cattle and ore to distant markets. This resulted in greatly increased productivity in ranching and great wealth for those ranchers like Walter Vail who had the foresight to buy land, water, and mineral rights to expand and diversify their holdings. The principal routes in the valley, the east-west I-10/railroad corridor and the north-south State Highway 83 reflect these early routes of travel and shipping.

Much of the original Empire Ranch continues to be used in ranching. Today, some 28 ranches, many of which include lands from the original homesteads and the Empire holdings, continue in operation in this subarea. Lands used in ranching include some 31,398 acres of private lands, 25 state trust land grazing leases, 4 state trust land grazing permits, about 16 BLM leases of various parcels, and 14 National Forest leases.

The larger ranches, which include principally cow-calf and some steer or stocker types of livestock operations, all utilize grazing and ranch management plans under which they implement their state and federal grazing leases.

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Table 4. Ranches in the Empire-Cienega Valley Watershed in Pima County

Agua Verde	Dykman	M Pierce	Rincon Peak
Andrada	Empire	Martin Cattle Co.	Rosemont
Apache Springs	Empirita	Martin	Sands Ranch
Cienega Creek	Gardner Canyon	Mescal	Sullivan
Clyne	Jay - Six	Miller	Thurber
Cross Station	L Pierce	Oak Tree	Willow Springs
Cumero	Lopez	Posta Quemada	X-9 Ranch

■ Ranch Conservation Potential:

The establishment of the Las Cienegas National Conservation Area will contribute greatly to the potential for much of the Empire-Cienega Valley to remain a viable area for sustainable ranching. Other factors that support sustainable ranching in the proposed NCA include the relative stability and long-term tenure of ranch lands comprised of private lands, State lands, BLM, and National Forest leases; the limited acreage of public lands designated for sale or commercial use outside the proposed NCA; low population pressure outside the urbanizing northwestern portion of the valley; the relatively long distance and access to the valley south of I-10 from the Tucson area; its proximity to existing preserves that allow grazing; a high proportion of productive grasslands; good average rainfall; and relatively high grazing capacity.

■ Summary & Conclusions:

To conclude, the Empire-Cienega Valley watershed continues to support stable and sustainable ranching operations in large part because of its environmental setting and the connectivity of its ranchlands and open space. The valley is located in a rich and varied environment that expresses a range of environmental zones from riparian bottomlands to high elevation evergreen forests, offering the opportunity to use different areas of the valley for grazing as forage becomes available seasonally. The principal vegetation type is scrub grasslands, which comprises some 70 percent of the vegetation in the subarea. Numerous water sources, both natural and constructed, provide water to both cattle and wildlife throughout the watershed in all elevations. Except for the urbanizing northwest portion and other small subdivisions, the valley remains largely rural, and significantly, some 243,758 acres, approximately 77 percent of the land in the subarea, are used in ranching and agriculture. This includes 31,398 acres, or 48 percent, of all private lands. Some 74,777 acres of public and private lands, or approximately 23 percent, of the valley are not used for ranch purposes. Public lands and preserves available for grazing account for 212,360 acres or 67 percent of the valley. At the present time there is limited threat from development pressure in the middle and southern portions of the valley; however, urbanization characterizes the northwestern portion of the valley. Population is currently very low at 3,312 people, although it is expected to grow significantly in the northwest with the development of Rocking K Ranch and Vail Valley Ranch. The Empire-Cienega Valley watershed currently has a high potential to continue sustainable ranching due in large measure to the proposed establishment of the Las Cienegas National Conservation Area.

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4.5 Mountain Park Considerations of the Las Cienegas National Conservation Area

- The proposed Las Cienegas National Conservation Area could facilitate the development of recreation management strategies. The recreation opportunities are numerous.

The Arizona Trail corridor will pass through a considerable portion of the proposed NCA. The Arizona Trail is a 750 mile non-motorized recreational trail that stretches from Utah to Mexico, passing through some of Arizona's most scenic back country. The trail is now nearly 70 percent complete. It is open to hikers, equestrians and mountain bicyclists.

Fifteen trails listed on the Eastern Pima County Trail System Master Plan (Pima County Ordinance No. 1996-75) cross or are located within the proposed National Conservation Area, including two utility corridor trails that will link with the Arizona Trail. These trails are presently being used for recreational purposes.

Hunting areas in eastern Pima County have been reduced by development, but hunting is also occurring within the proposed Area and will be permitted under the proposed legislation.

4.6 Land Use and Fiscal Considerations of the Las Cienegas National Conservation Area

- Land use and fiscal issues are detailed in a series of reports that numbers twenty-seven.
- Summary

The Cienega-Rincon Watershed lies in the south-eastern part of eastern Pima County, immediately west of Cochise County and south of the Saguaro National Park East. Land ownership is comprised primarily of State Trust Land.

The current land use for the sub-area is predominantly vacant land, mostly property that belongs to the State Land Trust. In the Cienega-Rincon Sub-area, land development has occurred primarily on five percent of the land, primarily on the north side of Interstate 10. The maximum development activity in varying densities, regulated and unregulated, occur in T15S, R16E; the northern half of T16S, R16E; and, the western half of T16S, R17E. The maximum density of residential uses occur in the form of medium and low intensity urban. In the past three years, rezoning of approximately 7,900 acres of land has occurred, permitting a total of 12,302 dwelling units. The acquisition and conservation of ranches have been somewhat successful in the prevention of urban sprawl.

The planned land uses for the sub-area include Medium/High and Low Intensity Urban, Low Intensity Rural, some Medium Intensity Rural, Resource Conservation, Resource Transition, and some Commercial Activity Centers. Zoning on vacant land is predominantly RH Rural Homestead; GR-1 Rural Residential; Specific Plans (Rocking K and Vail Valley); IR Institutional Reserve; and SH Suburban Homestead. Other districts include CR-1 Single Residential; CR-4 Mixed Dwelling Type; CI-1 Light Industrial/Warehouse; and, CI-2 General Industrial.

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Interstate 10 roughly bisects (horizontally) the watershed, connecting metro Tucson to Cochise County. Other roads include Old Spanish Trail, Colossal Cave Road, Camino Loma Alta, Sahuarita Road and Marsh Station Road.

The watershed is served by private wells and by a few water companies. The Cienega-Rincon Watershed Sub-area includes some large trunk sewers near the westerly edge, as well as a number of existing developments. Both the Rocking K and Vail Valley developments will be extending large trunk sewers past undeveloped land to their sites. Electricity, telephone and gas services are provided by Tucson Electric Company, US West and Southwest Gas Company, respectively. Individual propane tanks are also in use. The Vail Unified School District covers the northwestern majority of the watershed.

Currently, a total of nine capital improvement projects are underway, funded through various bonds with a total budget of over \$10 Million dollars.

Residential construction in the sub-area declined by almost 50 percent between 1998 and 1999, as revealed by the number of permits issued during those years. There has been minimal commercial construction.

■ Site Inventory and Analysis

Location

The Cienega Rincon Watershed sub-area lies in the south-western part of eastern Pima County, immediately west of Cochise County and south of the Saguaro National Park East. It extends from the Saguaro National Park East, due south to the county boundary with Santa Cruz County encompassing an area of approximately 318,535 acres.

Ownership

Land ownership is comprised primarily of State Trust Land. Others include the lands of the Bureau of Land Management; some small parcels of Federal land; Saguaro National Park East (partial); Coronado National Forest (partial); Cienega Creek Preservation area; county land; and, private land (including a considerable amount of ranch property).

Land Use

The current land use for the sub-area is predominantly vacant land, mostly property that belongs to the State Land Trust, public preserves and ranch property. Vacant land, public preserves and agricultural land combined constitutes approximately 95 percent of the total land (public preserves = 50 percent, vacant land = 35 percent and agricultural land = 10 percent). Other uses include rural uses, miscellaneous government, industrial, mobile home parks and subdivisions, small portions of single family residences and very little commercial.

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Land development in the watershed has occurred on five percent of the land, primarily on the north side of Interstate 10. The maximum development activity in varying densities occur in the Township-Range of T15S, R16E; the northern half of T16S, R16E; and, the western half of T16S, R17E.

Mobile homes fulfill the housing demands of a sizable portion of the watershed's population.

Over the past three years, rezoning of approximately 7,900 acres of land has occurred permitting a total of 12,302 dwelling units. Based on the number of dwelling units, at an average of 2.5 persons per dwelling, the projected population of the area is estimated to be 30,750 residents, in addition to the existing population and population resulting from unregulated development.

The major developments are the regulated subdivisions of Rocking K and Vail Valley, accounting for an estimated 11,172 dwelling units on 6,220 acres (over 78 percent of the total rezoned land). These two developments are expected to accommodate a population of approximately 27,930 residents.

Development, south of I-10, have occurred in an area southwest of the intersection of I-10 and Sonoita Mountain View Highway (State Highway 83) in what is called Corona de Tucson or New Tucson. A development of approximately five square miles, it includes subdivided as well as wild-cat lots.

Single family residences on subdivided land zoned CR-1 Single Family residences account for approximately 1,600 acres of land. About 320 acres are zoned for SR Suburban Ranch, and the remainder of about 1,600 acres is lot-split with single family residences and mobile homes.

In an area of approximately 11 square miles, east of State Highway 83 approximately seven miles south of its intersection with I-10, there is a fair amount of wild cat lot-splitting on land zoned RH Rural Homestead. The density of development is very low, with views of the Santa Rita Mountains to the southwest and the Empire Mountains to the south.

There is also regulated and unregulated development on both sides of I-10 where Pima and Cochise counties share their boundaries. Mobile home constitute a majority of the dwelling units in this area.

Industrial land in the watershed accounts for no more than a square mile and commercial land is almost non-existent.

Another significant land use is that of ranching and ranch conservation. "Pima County has participated in a number of ranch conservation efforts,...." In the Cienega-Rincon watershed, the County's past ranch conservation efforts include the Cienega, Empire, Empirita and Posta Quemada ranches.

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Planned Land Use

The planned land uses for the sub-area include Medium/High and Low Intensity Urban, Low Intensity Rural, some Medium Intensity Rural, Resource Conservation, Resource Transition, and some Commercial Activity Centers. The table below shows that Low Intensity Rural (LIR) and Resource Conservation (RC) account for most of the planned land use. A large portion of vacant state land, immediately north and northwest of the Empire Cienega Resource Conservation Area has been planned as resource conservation land. This would create an area of protected and semi-protected land on the entire length of the watershed, along a north-south axis. It would connect the existing natural preserves of the Saguaro National Park East, Coronado National Forest, Colossal Cave Park, Cienega Creek Preservation Area and the Empire Cienega Resource Conservation Area. There are approximately 133,295 acres of land, currently available in the watershed for non-preservation and non-agricultural land uses. Of this, a total of 44,528.69 acres have been planned for Resource Conservation (33.4 %) and 13,158.34 acres for Resource Transition (with a maximum development density of 0.3 RAC). A total of 47,182.42 acres, or 35.4 percent, have been planned for Low Intensity Rural development (with a maximum density of 0.3 RAC). This indicates that the overall development intent for the watershed is one of a low-density, residential, with exception of Rocking K and Vail Valley. At the current time, Activity Centers (commercial) account for a total of approximately 1,373 acres and Industrial (urban) reflects 11.72 acres, indicating a low-density, low-intensity area.

PLANNED LAND USE: CIENEGA-RINCON WATERSHED		
JURISDICTION	PLANNED LAND USE	ACRES
PIMA COUNTY	CAC	649.75
PIMA COUNTY	DR	307.21
PIMA COUNTY	I	11.72
PIMA COUNTY	LIR	47,182.42
PIMA COUNTY	LIU-0.3	1,101.84
PIMA COUNTY	LIU-0.5	2,829.00
PIMA COUNTY	LIU-1.2	173.94
PIMA COUNTY	LIU-3.0	4,110.84
PIMA COUNTY	MFC	714.09
PIMA COUNTY	MHIU	780.93
PIMA COUNTY	MIR	3,672.23
PIMA COUNTY	MIU	5,021.80
PIMA COUNTY	NAC	9.35
PIMA COUNTY	RC	44,528.69
PIMA COUNTY	RT	13,158.34
PIMA COUNTY	OUTSIDE PLAN AREA	9,041.59
TOTAL		

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Zoning

Zoning, on vacant land, is predominantly RH Rural Homestead. Other vacant land, in excess of 1,500 acres, include SP Specific Plan, GR-1 Rural Residential, IR Institutional Reserve and SR Suburban Ranch.

Industrial land, zoned either CI-1 Light Industrial/Warehouse or CI-2 General Industrial, accounts for approximately one square mile (with 390 acres vacant); and, less than 250 acres are zoned commercial (with about 100 acres vacant).

Currently, of the watershed's total land area of 318,535 acres, approximately 133,290 acres are vacant, but have zoning designations. Of the total vacant land, 117,400 acres (88 percent) are zoned RH Rural Homestead i.e. land earmarked for low-density residential uses. The combined industrial and commercial vacant land measures less than a square mile. The remaining vacant land includes single family residential, mobile homes, multifamily, etc. comprising of less than 1.5 percent of the total vacant land.

ZONING ON VACANT LAND: CIENEGA-RINCON WATERSHED		
JURISDICTION	ZONING DISTRICT	ACRES
PIMA COUNTY	RH	1.24
PIMA COUNTY	CB-1	43.89
PIMA COUNTY	CB-2	54.44
PIMA COUNTY	CI-1	390.52
PIMA COUNTY	CMH-1	20.32
PIMA COUNTY	CR-1	881.44
PIMA COUNTY	GR-1	4,536.68
PIMA COUNTY	IR	2,149.40
PIMA COUNTY	RH	
PIMA COUNTY	SH	307.31
PIMA COUNTY	SP	5,332.78
PIMA COUNTY	SR	1,533.70
PIMA COUNTY	SR-2	584.49
PIMA COUNTY	TH	60.04
TOTAL		

There are several rezoning cases that are either being reviewed currently or have been left open from as far back as the early 1960s. Some of these have conditional zoning while others do not. Cases related to residential rezonings show that a total of 7,697 lots are proposed - subject to zoning changes - on a total of 2,285 acres (at maximum allowable density for each zone district).

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5. Recommendations

For years the community has worked to conserve the resources in the Cienega Creek watershed. The most comprehensive proposal to date is found in the Las Cienegas National Conservation Area bill, backed by Congressman Jim Kolbe. Since Congressman Kolbe introduced legislation for the Las Cienegas National Conservation Area in September of 1999, the land and resource assessments being carried out to develop the Sonoran Desert Conservation Plan have been issued in a series of over 100 reports. The information found in many of these reports, together with a recent proposed listing for the Chiricahua Leopard Frog, strengthens the reasons for elevating the conservation status of lands in and around the boundaries of the proposed Las Cienegas National Conservation Area. While federal and county land aspire to a conservation commitment that recognizes the resource value of the area, the same can not be said for State Land. Therefore, these recommendations suggest a priority order for protecting State Land based on their natural and cultural resource value.

5.1 Priority 1 -- 28,525 acres of State Trust Land in Need of Conservation

In addition to conserving the approximate 5,991 acres of County-owned land, 36,520 acres of BLM land, and 48 acres of Forest Service land found within the Pima County jurisdictional area of the proposed Las Cienegas National Conservation Area, approximately 28,525 acres of State Land should be committed to conservation status, as reflected on the map on page 48. This minimum reserve would total 71,084 acres, without private land included. Nine specific sites are identified for conservation:

- (1) State Lands abutting the Cienega Creek Preserve in the I-10 area;
- (2) the Davidson Canyon area, due to it's importance to native fish;
- (3) A tract of State Land that connects the Pima County and BLM lands, due to its importance to native fish and frogs;
- (4) Land in the Wakefield Canyon area as identified due to its importance to native fish, frogs, and the potential to reintroduce the endangered Gila Topminnow;
- (5) Land to the west of the original NCA concept map, which is northeast of Sycamore Canyon (Section 34). The Lake area is important for exotic species management and for native fish conservation opportunities;
- (6) Spring Water Canyon presents native frog conservation opportunities;
- (7) The Empire Gulch tract is identified as a top priority due to the presence of native fish and frogs;
- (8) Gardner Canyon is important to riparian protection efforts; and
- (9) The Mud Springs Canyon tract is critical to overall riparian protection goals.

Conservation Resources in the Las Cienegas NCA

Priority 1 - 28,525 Acres

-  Las Cienegas NCA Boundary
-  Administrative Boundaries
-  County Lines
-  Federal Ownership
-  State Ownership
-  Pima County Ownership
-  City of Tucson Ownership
-  Private Ownership
-  No record
-  Selected Lands

STATE LANDS = 28,525 ac.

Ownership source: Pima County Assessor

Pima County Index Map



Index Map Scale 1:500,000



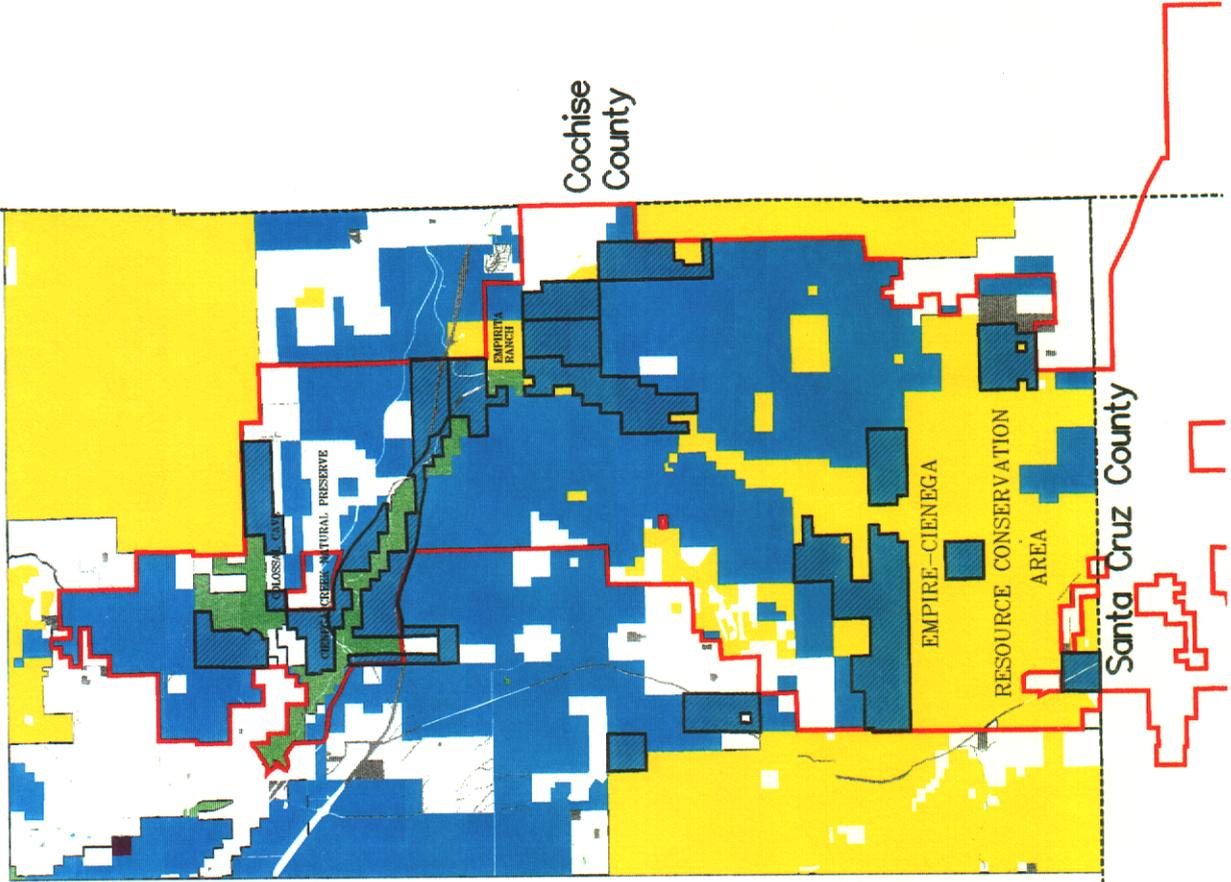
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Project: /s/conserv/assess/01/ncs_pr1_sml.ap

PlotDate: 07/03/09



5.2 Priority 2 -- 63,293 acres of State Land in Need of Conservation

When the 28,525 acres of State Land described and mapped above are secured for conservation purposes, the following tracts are important to protect next, in addition to conserving the approximate 5,991 acres of County-owned land, 36,520 acres of BLM land, and 48 acres of Forest Service land found within the Pima County jurisdictional area of the proposed Las Cienegas National Conservation Area. Approximately 63,293 acres of State Land would be committed to conservation status, as reflected on the map on page 50. This reserve would total 105,852 acres, without private land included. Five specific sites are identified for conservation, bringing the total State Land contribution to 63,293:

- (1) State Land near Colossal Cave is important for the unique species supported by its limestone habitat;
- (2) The Agua Verde State Land abutting the Coronado National Forest is important;
- (3) The Mescal Arroyo in the I-10 area is important for purposes of supporting a bosque and associated riparian species;
- (4) Lower Wakefield and Smitty Spring area is included; and
- (5) The Montosa / Apache Spring tract is identified as important in this second tier of protection.

SUMMARY OF ACRES BY LAND OWNER -- PRIORITY 2 RESERVE	
JURISDICTION	ACRES
PIMA COUNTY	5,991
BLM	36,520
FOREST SERVICE	48
STATE LAND	63,293
TOTAL	105,852

Conservation Resources in the Las Cienegas NCA Priority 2 - 63,293 Acres

- Las Cienegas NCA Boundary
- Administrative Boundaries
- County Lines
- Federal Ownership
- State Ownership
- Pima County Ownership
- City of Tucson Ownership
- Private Ownership
- No record
- Selected Lands

STATE LANDS = 63,293 ac.

Ownership source: Pima County Assessor

Pima County Index Map



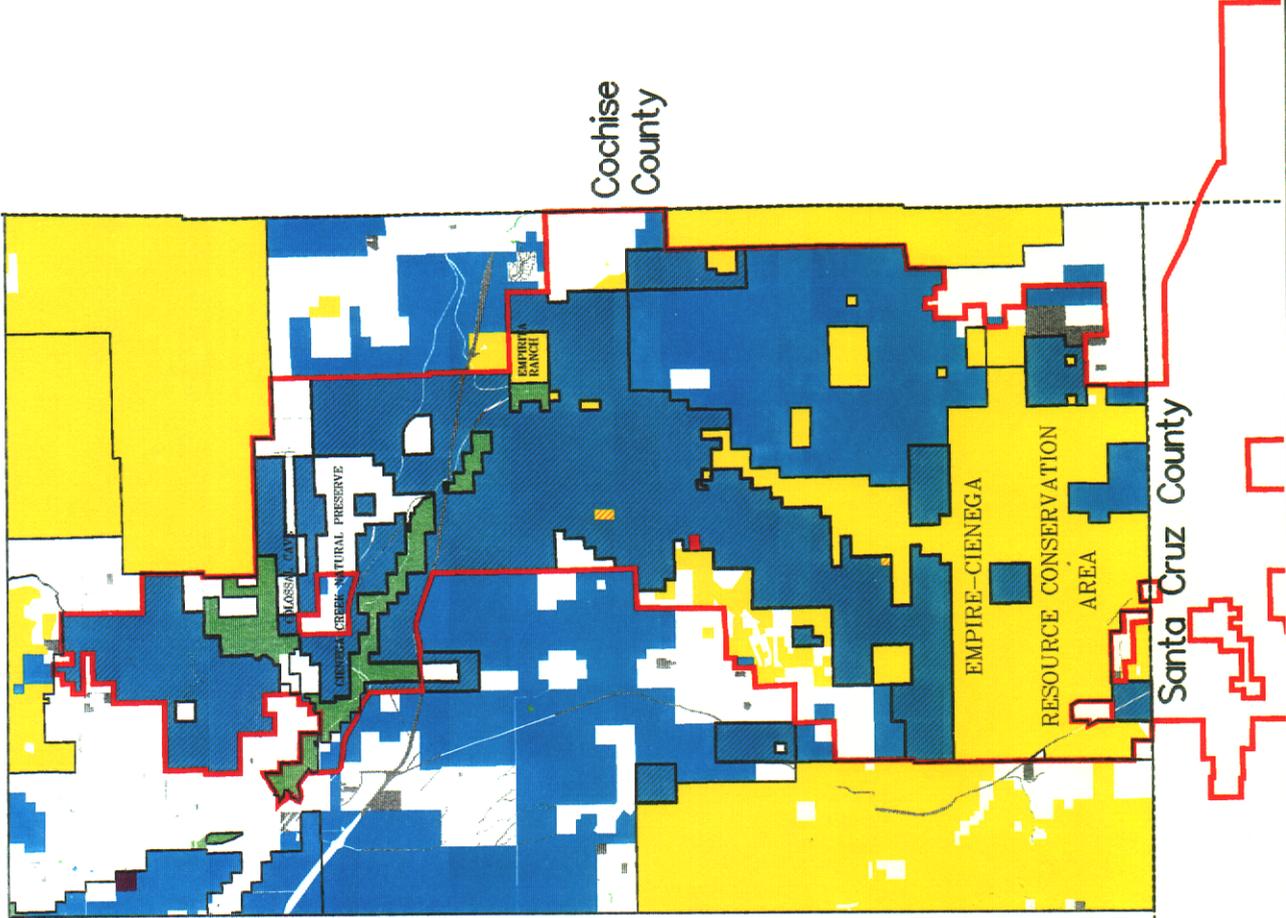
Index Map Scale 1:1,000,000



Scale 1:64,000



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5.3 Priority 3 -- 89,641 acres of State Land in Need of Conservation

The remaining State Land within the original concept map for the NCA becomes important to protect when the priorities described above are met, in addition to conserving the approximate 5,991 acres of County-owned land, 36,520 acres of BLM land, and 48 acres of Forest Service land found within the Pima County jurisdictional area of the proposed Las Cienegas National Conservation Area. Approximately 89,641 acres of State Land within the original concept map of the NCA in Pima County would be committed to conservation status, as reflected on the map on page 52. This reserve within Pima County would total 132,200 acres, without private land included. Specific sites are identified for conservation: (1) State Land to the west of Cienega Ranch; (2) State Land to the east of Cienega Ranch; and (3) the North Oak Tree and Middle Canyons tract.

SUMMARY OF ACRES BY LAND OWNER -- PRIORITY 3 RESERVE	
JURISDICTION	ACRES
PIMA COUNTY	5,991
BLM	36,520
FOREST SERVICE	48
STATE LAND	89,641
TOTAL	132,200

5.4 Priority 4 -- 91,114 acres of State Land in Need of Conservation

The Lake area to the west of the Las Cienegas NCA boundary was identified within the top priority tracts for protection. The Barrel Spring tract, also to the west is important too, for its high resource value. The 89,641 acres of State Land within the original concept map of the NCA in Pima County would be committed to conservation status, along with 1,473 acres to the west of the area. This reserve within Pima County would total 133,673 acres, without private land included.

SUMMARY OF ACRES BY LAND OWNER -- PRIORITY 4 RESERVE	
JURISDICTION	ACRES
PIMA COUNTY	5,991
BLM	36,520
FOREST SERVICE	48
STATE LAND	91,114
TOTAL	133,673

The Priority 3 proposal is mapped on page 52; a map of Priority 4 (the original NCA concept within Pima County) is found on page 53; and a composite map is found on page 54.

Conservation Resources in the Las Cienegas NCA

Priority 3 - 89,641 Acres

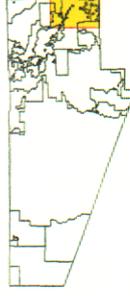
-  Las Cienegas NCA Boundary
-  Administrative Boundaries
-  County Lines
-  Federal Ownership
-  State Ownership
-  Pima County Ownership
-  City of Tucson Ownership
-  Private Ownership
-  No record
-  Selected Lands

OWNERSHIP WITHIN NCA

STATE LANDS	89,641 ac.
BLM LANDS	96,520 ac.
COUNTY PARK LANDS	5,991 ac.
NATIONAL FOREST LANDS	48 ac.
PRIVATE LANDS	14,875 ac.
TOTAL	147,075 ac.

Ownership source: Arizona State Land Department

Pinna County Index Map



Scale: 1:64,000

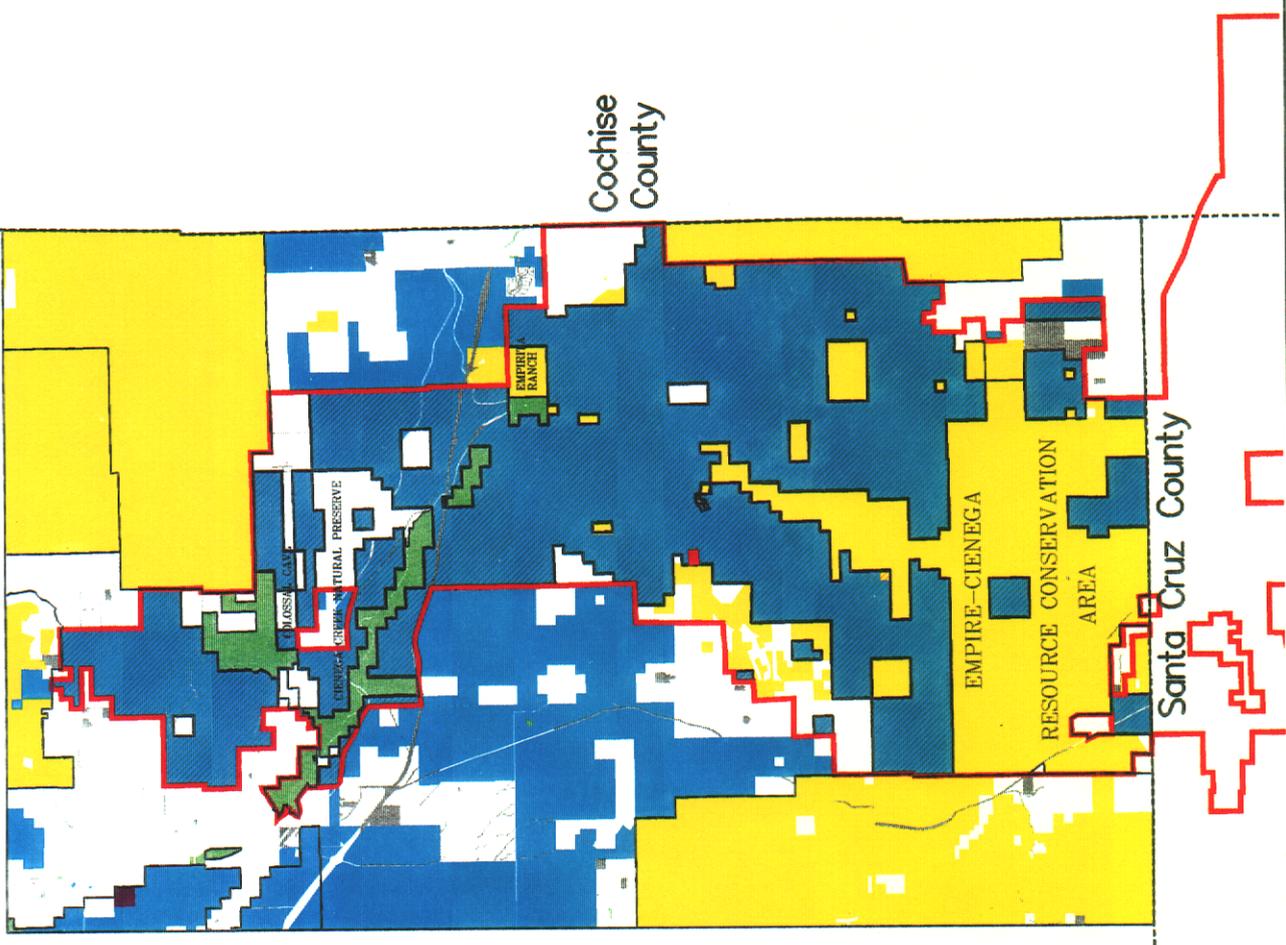


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THE COUNTY OFFICE OF TRANSPORTATION
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Conservation Resources in the Las Cienegas NCA Priorities 1, 2, and 4

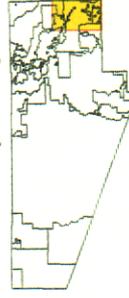
- Las Cienegas NCA Boundary
- Administrative Boundaries
- County Lines
- Federal Ownership
- State Ownership
- Pima County Ownership
- City of Tucson Ownership
- Private Ownership
- No record
- Priority 4 - 91,114 Ac.
- Priority 2 - 63,293 Ac.
- Priority 1 - 28,825 Ac.

OWNERSHIP WITHIN NCA

STATE LANDS	89,641 ac.
BLM LANDS	36,520 ac.
COUNTY PARK LANDS	5,991 ac.
NATIONAL FOREST LANDS	14,875 ac.
PRIVATE LANDS	14,875 ac.
TOTAL	147,075 ac.

Ownership source: Arizona State Land Department

Pima County Index Map



Index Map Scale: 1:50,000

This map was prepared using the data provided by the Arizona State Land Department. The accuracy of this map is dependent on the accuracy of the data provided. The user assumes all responsibility for the accuracy of the information depicted on this map. No warranty is made by the State of Arizona or the Department of Agriculture for any use of this map for purposes not intended by the State of Arizona or the Department of Agriculture.

Scale: 1:64,000

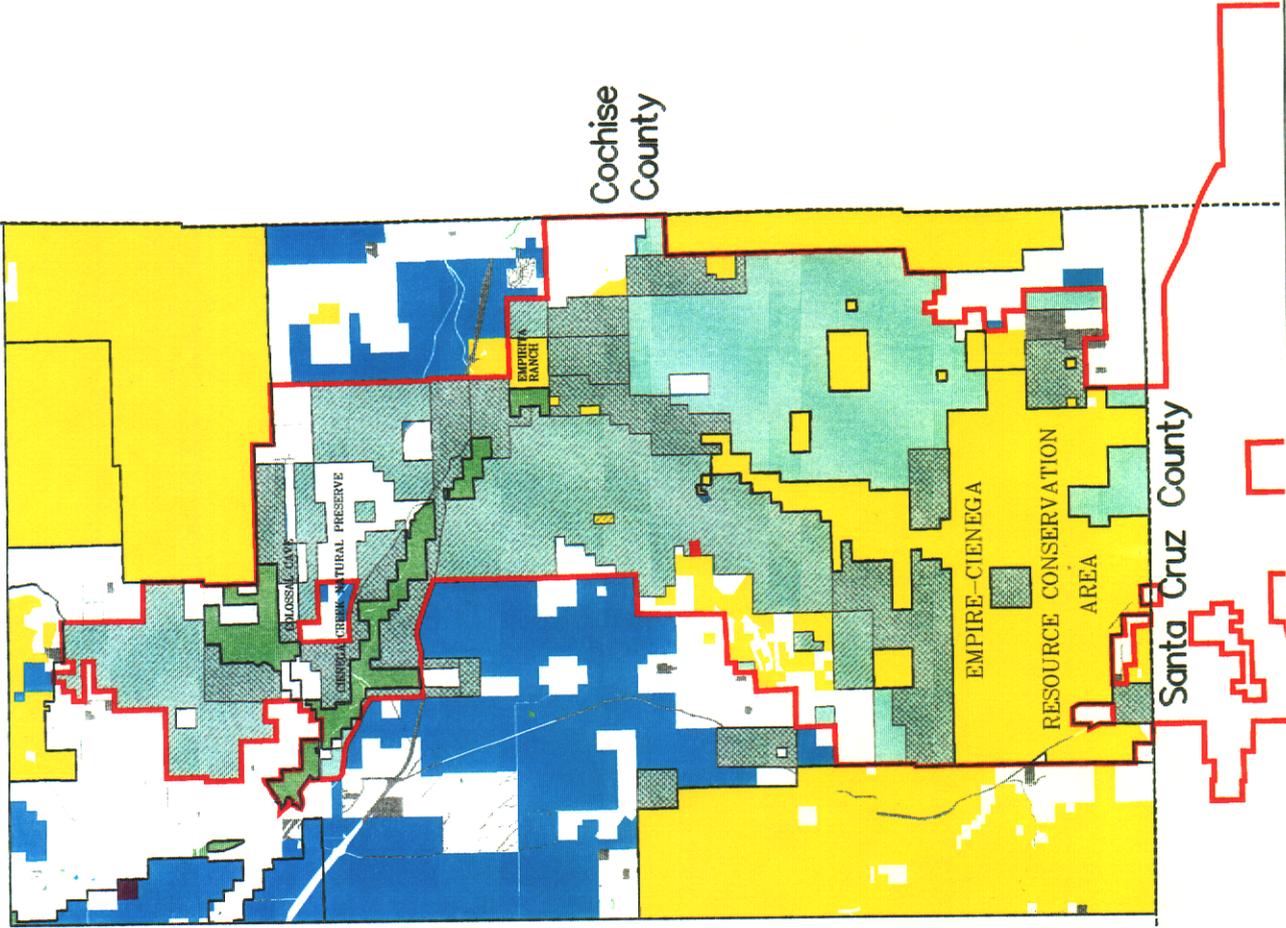


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Project: 07/07/00



Cochise County

Santa Cruz County

EMPIRE-CIENEGA
RESOURCE CONSERVATION
AREA

GIGASAL CANYON
SANTA CRUZ NATURAL PRESERVE

SANTA CRUZ RANCH

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6. Conclusion

These pages provide further proof of what many members of the community have known for decades -- that the Cienega Rincon watershed needs to be protected and conserved.

Only a lack of intergovernmental coordination and commitment is standing in the way of effectively carrying out the hopes of the community. This report is intended to express Pima County's continuing commitment to protecting the area. A strategy for prioritizing areas in need of protection is suggested.

Protecting the Cienega Creek watershed is a major positive step for advancing conservation in Southern Arizona. It benefits not only Pima County, but the entire state. By making a long term commitment to conserve natural resources in defined parts of the region, we will also create certainty for other land uses under within the region.

The proposed National Conservation Area, consistent with the Pima County Sonoran Desert Conservation Plan initiated by the Board of Supervisors, holds a great deal of promise for the long term stability of the economic and natural resources of our region.

The Las Cienegas National Conservation Area has strong and diverse support from those who understand the importance of creating a balance of fiscal and natural resources through landscape planning that will improve the quality of life for many generations of Tucson citizens.