

**ECONOMIC ANALYSIS
OF
CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Division of Economics
U.S. Fish and Wildlife Service
U.S. Department of the Interior

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PREFACE

This preface provides information on the approach used by Industrial Economics Incorporated (IEc) to assess the economic impacts that may result from designation of critical habitat for the cactus ferruginous pygmy-owl (hereafter referred to as the "pygmy-owl"), under contract to the U.S. Fish and Wildlife Service (FWS).

To evaluate the *increment* of economic impacts attributable to critical habitat designation for the pygmy-owl, above and beyond those effects associated with the ESA listing, it is necessary to compare a "without critical habitat" baseline to a "with critical habitat" scenario, measuring the net change in economic activity. The "without critical habitat" baseline represents current and expected economic activity under all existing restrictions prior to critical habitat designation, including Endangered Species Act (ESA) listing restrictions.¹ While IEc recognizes that the ESA listing may result in current and future economic impacts, these impacts were not the subject of this analysis.

To assess the incremental economic impacts of critical habitat designation for the pygmy-owl, IEc required policy direction from FWS on what restrictions will be imposed under critical habitat designation, over and above those associated with the listing. It is important to note here that it would not be appropriate for IEc to make such a policy determination. IEc requested that FWS consider what land management/use within the proposed critical habitat designation for the pygmy-owl might result in a ruling of adverse modification (critical habitat effects) without an accompanying jeopardy ruling (listing effects). Identifying these land management/use actions provides IEc with a basis for evaluating the incremental economic impacts due to critical habitat designation for the pygmy-owl.

FWS staff in Phoenix, AZ, Albuquerque, NM, and Washington, DC discussed potential land management/use actions and determined that, for the pygmy-owl critical habitat designation, there is no action that would result in an adverse modification ruling without an accompanying jeopardy ruling. In other words, critical habitat designation for the pygmy-owl would place no restrictions on land uses and activities *above and beyond restrictions that already exist under the ESA listing* of the pygmy-owl. Based on this guidance from FWS, IEc determined that critical habitat designation for the pygmy-owl would result in no direct economic impacts.

However, to ensure that no land management/use within the proposed critical habitat areas might result in restrictions above and beyond existing listing restrictions, IEc conducted the following assessment:

- Collected information on current and planned land uses in proposed critical habitat areas;

¹ In addition to Section 7 jeopardy rulings, listing a species may result in economic impacts attributable to Section 9 provisions regarding illegal take and to Section 4(d) protective regulations.

- Identified whether a federal nexus to these activities exists; and
- Requested FWS guidance on: (1) whether each land use might be subject to restrictions under the ESA listing for the pygmy-owl; and (2) whether additional restrictions might be imposed under the critical habitat designation.

In all cases, the FWS determined that no additional restrictions would be imposed under the critical habitat designation beyond existing restrictions under the listing.

In light of the lack of direct economic impacts, IEC evaluated the possibility of unintended economic impacts due to the critical habitat designation. Specifically, IEC considered how the public's perception of additional land use restrictions under the critical habitat designation may result in real reductions in land values and real estate transactions. These impacts may occur even though additional restrictions on land uses within critical habitat will not actually be imposed.

EXECUTIVE SUMMARY

The U.S. Department of the Interior's Fish and Wildlife Service (FWS) proposed designation of critical habitat for the cactus ferruginous pygmy-owl (referred to as the "pygmy-owl" throughout this report) on December 30, 1998. Under Section 4(b)(2) of the Endangered Species Act (ESA) of 1973, the Secretary of the Interior must evaluate economic and other relevant impacts that may result from the proposed critical habitat designation. If the Secretary determines that economic or other benefits of exclusion outweigh the benefits of designating an area as critical habitat, that area may be excluded from critical habitat, unless such exclusion would result in extinction of the species.

The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed Critical habitat designation for the pygmy-owl. Three general steps were followed to identify potential impacts:

- 1. What land uses and activities within the proposed critical habitat designation may be affected?** Potential impacts were identified by reviewing public comments and hearings on the proposed critical habitat designation and through interviews with federal, state, and county land management agency staff, as well as building association representatives and private landowners.
- 2. Does the land use or activity involve a "federal nexus"?** Critical habitat designation restrictions can only be imposed on state, county, and private land uses and activities when a "federal nexus" exists (i.e., the activities or land uses of concern involve federal permits, federal funding, or other federal actions). If no federal nexus exists, state, county, and private land uses and activities are not restricted by critical habitat designation. For federally managed land, critical habitat designation may restrict land uses and other actions that could adversely modify habitat.
- 3. Would the land use or activity face *additional* restrictions under the proposed critical habitat designation, above and beyond existing restrictions under the ESA listing of the pygmy-owl?** This analysis only evaluates economic impacts caused by critical habitat restrictions that are above and beyond impacts caused by the ESA listing of the pygmy-owl. Determinations of whether a land use or activity would face additional restrictions under the proposed critical habitat designation are based on FWS guidance. It should also be noted that if a land use or activity is limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions are not properly attributable to the critical habitat designation.

To evaluate the increment of economic impacts attributable to the critical habitat designation for the pygmy-owl, above and beyond the ESA listing, the analysis assumes a “without critical habitat” baseline and compares it to a “with critical habitat” scenario, measuring the net change in economic activity. The "without critical habitat" baseline represents current and expected economic activity under all existing restrictions prior to critical habitat designation. Only those actions that may be affected by restrictions imposed by critical habitat designation, above and beyond existing restrictions, are considered in this economic analysis.

Proposed Critical Habitat

FWS has proposed eight units of critical habitat for the pygmy-owl in the southwest Arizona counties of Pinal, Pima, Maricopa, and Cochise. The proposed units form an interconnected system of 733,786 acres of suitable and potential habitat for the species. Lands already believed to offer adequate protection for the pygmy-owl, such as National Park lands or National Monument lands, are excluded from critical habitat designation. Any existing significant structures within the critical habitat area, such as roads, buildings, and aqueducts, which do not contain the constituent elements necessary to support this species, are not considered critical habitat. Exhibit ES-1 displays how the 733,786 acres of critical habitat for the pygmy-owl are distributed across federal, state, and county land management agencies, and private landholders.

Exhibit ES-1		
PROPOSED CRITICAL HABITAT ACREAGE BY MANAGER, HOLDER, OR OWNER		
Manager, Holder, or Owner of Proposed Critical Habitat	Total Acres	Percentage of Total
U.S. Department of the Interior, Bureau of Land Management	91,283	12.4 %
U.S. Department of Agriculture, Forest Service	38,380	5.2 %
U.S. Department of the Interior, Bureau of Reclamation	11,596	1.6 %
U.S. Department of Defense	3,891	0.5 %
U.S. Department of the Interior, Bureau of Indian Affairs	219*	0.03 %
<i>Subtotal of Federal Land</i>	<i>145,369</i>	<i>19.8 %</i>

Exhibit ES-1 (Continued)		
PROPOSED CRITICAL HABITAT ACREAGE BY MANAGER, HOLDER, OR OWNER		
Manager, Holder, or Owner of Proposed Critical Habitat	Total Acres	Percentage of Total
Arizona State Land Department	434,651	59.2 %
County	18,109	2.5 %
Private	135,657	18.5%
<i>Subtotal Non-Federal Land</i>	<i>588,417</i>	<i>80.2 %</i>
TOTAL	733,786	100.0 %
<p>* Comments received from the Bureau of Indian Affairs (BIA) indicate that BIA owns 13,000 acres of land in Units 5b and 6, located approximately between Florence and the confluence of the Gila and San Pedro Rivers. Because this acreage overlaps with reported Bureau of Reclamation and private holdings, contacts were made with agency staff at the Bureau of Reclamation and the BIA to inquire about the ownership of this land. However, further data on land ownership were not available at the time of report publication. Source: U.S. Fish and Wildlife Service, Geographic Information System Maps, March 3, 1999.</p>		

Impacts of Critical Habitat Designation on Federal, State, County, and Private Land

The proposed critical habitat for the pygmy-owl includes federal, state, county, and private land. This analysis identifies uses of these lands subject to restrictions under the proposed critical habitat designation, above and beyond restrictions from the ESA listing or other existing statutes, regulations, or policies. These land uses and activities are evaluated to determine potential national and regional economic effects of the critical habitat designation.

Exhibit ES-2 summarizes the potential impacts of critical habitat designation for the pygmy-owl on federal, state, county, and private land uses and activities. According to guidance from FWS staff, critical habitat designation will place no restrictions on these land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. Therefore, no economic impacts are expected from critical habitat restrictions.

Impacts Due to Public Perception

Even though restrictions on land use are the same for land within critical habitat as for land outside of critical habitat, the public may perceive or expect the risk of additional restrictions from critical habitat designation. This perception may result in *real* reductions in land values and real estate transactions. Over time, as the public awareness grows that critical habitat will not result in additional restrictions, the impact of critical habitat designation on property markets can be expected to decrease to the level of impacts associated solely with the listing restrictions. The scale of impacts

depends on how great the initial effects of public perception are on property markets and the length of time it takes for public awareness to grow that critical habitat designation will not result in additional restrictions.

Social And Community Impacts

Small entities and communities potentially affected by critical habitat designation include: (1) Indian Allotments; (2) towns dependent on a large single employer (i.e., ASARCO) that may be affected; (3) bond security for districts that have recently invested in infrastructure; and (4) small businesses located within designated critical habitat. As noted previously, FWS guidance suggests that critical habitat designation will not impose additional restrictions above and beyond the restrictions that already exist under the ESA listing. Therefore, no impacts from the critical habitat designation are expected for these small entities and communities.

Exhibit ES-2						
SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION FOR THE CACTUS FERRUGINOUS PYGMY-OWL						
Manager, Holder, or Owner of Land	Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
U.S. Dept. of the Interior, Bureau of Land Management	Recreation	1, 2, 5a, 6	Potential habitat destruction	Possibly	No	None
	Right-of-ways	4	Right-of-way permits	Possibly	No	None
	Grazing	1, 2, 4, 5a, 6	Grazing permits	Possibly	No	None
	Land exchange	5a, 7	Transfer of ownership	Possibly	No	None
U.S. Dept. of Agriculture, Forest Service	Recreation	7	Potential habitat destruction	Possibly	No	None

Exhibit ES-2 (Continued)

**SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Manager, Holder, or Owner of Land	Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	<i>Additional</i> Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
U.S. Dept. of the Interior, Bureau of Reclamation	Aqueduct	2, 4	Regular clearing of vegetation	Possibly	No	None
U.S. Dept. of the Interior, Bureau of Indian Affairs	Routine maintenance of irrigation and power facilities; Construction of new power lines.	5b, 6	Potential habitat destruction	Possibly	No	None
U.S. Dept. of Defense	Military training	6	Habitat destruction from artillery range	Possibly	No	None
Pima County, Parks and Recreation Department	Trail construction; facility improvements	2	Section 404 permit, Section 401 permit	Possibly	No	None
Private	Current and planned land development	Mainly 3 and 4	Section 404 permit; FHA funding, Section 401 permit	Possibly	No	None
	Mining activity	6	Section 404 permit, Section 401 permit	Possibly	No	None

* Possible restrictions are based on guidance from FWS staff in Phoenix, Arizona office.

Sources: Public comments received in response to the proposed critical habitat designation; (2) public hearings held on the proposed critical habitat designation; and (3) interviews of staff at federal, state, and county land management agencies, as well as building association representatives and private landowners.

The U.S. Department of the Interior's Fish and Wildlife Service (FWS) published a proposed rule to list the cactus ferruginous pygmy-owl (referred to as the "pygmy-owl" throughout this report) as endangered in Arizona and threatened in Texas on December 12, 1994, under provisions of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531et seq.) As part of the proposed rule, FWS also proposed designation of critical habitat in Arizona for the species. Following a review of information and public comments received on the rule, FWS elected to list the pygmy-owl as an endangered species in Arizona on March 10, 1997 (62 FR 10730). FWS also determined that critical habitat in Arizona was not prudent and that listing in Texas was not warranted.

Following the publishing of this final rule, Southwest Center for Biological Diversity filed a lawsuit against the Secretary of the Department of the Interior, on the basis that the determination regarding critical habitat did not include a review of all relevant and applicable data. In October 1998, a Senior U.S. District judge found that there was no evidence that designation of critical habitat for the pygmy-owl was not prudent. He later ordered the Department of the Interior to re-evaluate its determination regarding critical habitat. In response, FWS proposed designation of critical habitat for the pygmy-owl on December 30, 1998.

Critical habitat designation can help focus conservation activities for a listed species by identifying areas, both occupied and unoccupied, that contain or could develop essential critical habitat features. Critical habitat designation contributes to the awareness of federal land-managing agencies and the public about the importance of these areas. However, the designation of critical habitat has no effect upon private actions on private lands and only applies where there is a federal connection involved, such as funding, permits, or other federal actions. Beyond this informational role, the designation of critical habitat may provide protection to areas where significant threats to the species have been identified. This protection may be required under the ESA Section 7, which requires federal agencies to ensure that activities they fund, authorize, or carry out are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.

Consultation Under Section 7 of the Endangered Species Act

During Section 7 consultation, FWS reviews proposed federal actions and determines whether the action is likely to jeopardize the continued existence of the species or adversely modify its critical habitat. In cases where a species has been listed without designation of critical habitat, FWS only determines whether the proposed action is likely to jeopardize the continued existence of the species. In cases where critical habitat has been designated, FWS also determines whether the proposed action is likely to adversely modify critical habitat. According to the ESA, jeopardy is defined as any action that would appreciably reduce the likelihood of both the survival and recovery of the species. Adverse modification of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of the species. Determination of whether an activity will result in jeopardy to the species or adverse modification of its critical habitat is dependent on a number of variables, including type of project, size, location, and duration.

If FWS determines that a proposed action will jeopardize or adversely modify the critical habitat of a species, it is required to provide, to the extent possible, reasonable and prudent alternatives to the proposed action. By definition, reasonable and prudent alternatives permit the continuance of the project while removing the elements that jeopardize the species or adversely modify its habitat. FWS also expects that most activities will find that a jeopardy or adverse modification determination can be avoided by modifying the planned activity, if necessary. FWS also expects that most activities that result in a finding of adverse modification of critical habitat are also expected to result in a jeopardy determination. Impacts attributable solely to critical habitat designation would result only when an activity adversely modifies critical habitat of the pygmy-owl, but does not jeopardize the pygmy-owl.

As mentioned previously, this economic analysis examines only the incremental restrictions that result from a determination of adverse modification of critical habitat, as assessed through Section 7 consultation. Based on the expected outcomes of likely Section 7 consultations for the affected areas, this analysis seeks to isolate any costs potentially resulting from determinations of adverse modification of critical habitat designation for the pygmy-owl; it does not attempt to estimate economic effects from the ESA listing of the species.

Purpose and Approach of Report

Under Section 4(b)(2) of the ESA, the Secretary of the Interior must evaluate economic and other relevant impacts that may result from the proposed designation of critical habitat. If the Secretary determines that economic or other benefits of exclusion outweigh the benefits of designating an area as critical habitat, that area may be excluded from critical habitat unless such exclusion would result in extinction of the species.

The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for the pygmy-owl. The analysis was conducted by assessing how critical habitat designation for the pygmy-owl may affect current and planned land uses and activities on federal, state, county, and private land. For federally managed land, designation of critical habitat may restrict land uses, activities, and other actions that threaten to adversely modify habitat. For state, county, and private land, critical habitat designation restrictions on land uses and activities can only be imposed when a "federal nexus" exists (i.e., the activities or land uses of concern involve federal permits, federal funding, or other federal actions). Activities on state, county, and private land that do not involve a federal nexus are not restricted by critical habitat designation.

In addition to determining whether a federal nexus exists, the analysis must distinguish between economic impacts caused by the ESA listing of the pygmy-owl and those additional effects that would be caused by the proposed critical habitat designation. *The analysis only evaluates economic impacts resulting from additional restrictions under the proposed critical habitat designation that are above and beyond impacts caused by existing restrictions under the ESA listing of the pygmy-owl.* Finally, in the event that a land use or activity would be limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions would not be attributable to critical habitat designation.

To evaluate the increment of economic impacts attributable to the designation of critical habitat, above and beyond the ESA listing, the analysis assumes a "without critical habitat" baseline and compares it to a "with critical habitat" scenario, measuring the net change in economic activity. The "without critical habitat" baseline represents current and expected economic activity under all existing restrictions prior to the designation of critical habitat. Only those actions that may be affected by restrictions imposed by critical habitat designation, above and beyond existing restrictions, are considered in this economic analysis. Moreover, actions must be "reasonably foreseeable," defined as projects which are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public.

Structure of Report

The remainder of this report is organized as follows:

- **Section 2: Information Sources and Framework for Analysis** - Highlights sources of information for the report and describes the framework and methodology for the economic analysis.
- **Section 3: Description of Species and Proposed Critical Habitat Areas:**
 - Provides general information on the species and a brief description of proposed critical habitat areas.

- **Section 4: Impacts of Critical Habitat Designation on Land Use: Federal, State, County, and Private Land** - Identifies and assesses potential economic and other relevant impacts from the proposed critical habitat designation.
- **Section 5: Impacts Due to Public Perception of Critical Habitat Designation** - Assesses the impacts that may result from public perception that critical habitat designation will impose additional restrictions above and beyond those existing restrictions under the ESA listing.
- **Section 6: Social and Community Impacts** - Identifies impacts to small entities and communities located within the proposed critical habitat.
- **Appendix A: Maps of Critical Habitat Areas:** - Provides maps of the proposed critical habitat units, including information on acreage by ownership/management.

This section describes the primary sources of information used to develop this report and provides an overview of the framework for analysis, including a description of the methodology used to determine potential economic impacts from the proposed designation of critical habitat for the pygmy-owl.

Information Sources

Numerous sources contributed to the development of this report, providing information on issues such as the ownership and management of lands within the proposed critical habitat designation, potentially affected activities and land uses, and economic impacts. The primary sources of information for this report fall into the following categories:

- **Personal Communications:** Numerous federal, state, and county agency staff involved in the management of land within the proposed critical habitat designation were contacted by phone to identify potentially affected current and planned activities and land uses and to provide data on possible economic impacts. In addition to federal, state, and county staff, several private landowners were contacted, including developers and ranchers. Phone interviews were conducted in March and April 1999.
- **Public Comments:** Public comments received in response to the proposed critical habitat designation for the pygmy-owl on December 30, 1998, provided valuable information on potentially affected land uses and activities, as well as possible economic impacts. Public comments on the draft economic analysis were also useful in developing the final report.

- **Public Hearings:** As part of the public comment period for the proposed critical habitat designation, public hearings were held in Sierra Vista, Tucson, and Coolidge, Arizona in February 1999. Transcriptions of the hearings were reviewed to identify possible impacts from the proposed critical habitat designation.
- **Geographic Information System (GIS) Maps:** FWS provided GIS maps of the proposed critical habitat units, displaying land ownership/management by square mile parcel and providing acreage estimates. The estimates were confirmed through personal communications with federal, state, and county agency staff.

Framework for Analysis

This economic analysis examines the impacts of restricting specific land uses or activities within areas designated as critical habitat. The analysis evaluates impacts in a "with" critical habitat designation versus a "without" critical habitat designation framework, measuring the net change in economic activity. The "without" critical habitat designation scenario, which represents the baseline for analysis, includes all protection already accorded to the pygmy-owl under state and federal laws, such as the Fish and Wildlife Coordination Act, the National Environmental Policy Act, the Clean Water Act, and the Migratory Bird Treaty Act. The ESA listing added additional protection in its listing provisions. The focus of this economic analysis is to determine the impacts from restrictions on land uses and activities from the designation of critical habitat that are above and beyond the impacts due to existing restrictions under state and federal laws and regulations.

Steps to Identify Potential Impacts from Critical Habitat Designation

Listed below are the three steps that were followed to identify economic impacts from the proposed critical habitat designation.

1. **What land uses and activities within the proposed critical habitat designation may be affected?** As noted above, potential impacts were identified by reviewing public comments, public hearings, and through phone conversations with federal, state, and county land management agencies, building associations, and private landowners.

2. **Does the land use or activity involve a "federal nexus"?** Critical habitat designation restrictions can only be imposed on land uses and activities on state, county, and private land when a "federal nexus" exists (i.e., the activities or land uses of concern involve federal permits, federal funding, or other federal actions). Activities on state, county, and private land that do not involve a federal nexus are not restricted by critical habitat designation. Therefore, they are not included in this economic analysis. For federally managed land, designation of critical habitat may restrict land uses, activities, and other actions that threaten to adversely modify habitat.

3. **Would the land use or activity face *additional* restrictions under the proposed critical habitat designation, above and beyond existing restrictions under the ESA listing?** As noted above, the baseline for analysis includes all restrictions on land use existing prior to the proposal of critical habitat, including listing restrictions. Only impacts from restrictions above and beyond this baseline are considered. Determinations of whether a land use or activity would face additional restrictions under the proposed critical habitat designation are based on FWS guidance. Those land uses and activities that would be subject to additional restrictions under the proposed critical habitat designation are evaluated to determine the potential national economic efficiency effects and regional economic impacts.

National and Regional Economic Effects

The economic effects of designation of critical habitat consist of those factors affecting national income (i.e., national economic efficiency effects) and those economic and social impacts that are important on a local or regional level (i.e., regional economic impacts).

- **National economic efficiency effects** are those consequences of critical habitat designation that represent a change in national income. Efficiency effects include, among other things, recreation (consumer surplus) values as well as management and construction costs in an area that would not be required without critical habitat designation. Impacts on national income may be positive (benefits) or negative (costs). For example, if road construction is prohibited in an area to avoid adverse modification, primitive recreation may be preserved in an area (a benefit) while development of motorized recreation is precluded (a cost).

- **Regional economic effects** (or distributional effects) relate to equity and fairness considerations associated primarily with how income and wealth are divided among regions and groups. These effects are represented by changes in regional employment, household income, or state/local tax revenue that

may have offsetting effects elsewhere in the economy. For example, if the designation of critical habitat results in less construction and development activity within critical habitat areas, this activity may increase in other nearby areas suitable for development. While this may have important economic impacts on different local economies, it may have little or no effect on the regional or national economy.

Benefits of Critical Habitat Designation

Critical habitat designation may also result in economic benefits in terms of preserving or enhancing non-recreational values provided directly by the species and indirectly by its habitat. Categories of potential benefits for the pygmy-owl include scenic beauty, biodiversity, ecosystem, and intrinsic (passive use) values.² These benefits may result because society, species, and ecosystems are spared adverse and irreversible effects of habitat loss and species extinction. Quantitative or monetary values for these potential benefits of critical habitat designation, however, are not provided in this report due to the lack of available data.

² Intrinsic values, also referred to as passive use values, include categories of economic benefits such as existence value, i.e., knowledge of continued existence of a resource or species; and bequest value, i.e., preserving the resource or species for future generations.

Description of Species and Common Habitat³

The cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is a small bird, approximately 6-7 inches long and reddish-brown in color. It features a cream-colored belly streaked reddish-brown, as well as a reddish-brown tail, unusually long for an owl. The pygmy-owl has yellow eyes and it lacks ear tufts. The bird is diurnal and its call, a monotonous series of short notes, is most commonly heard at dawn and dusk. The cactus ferruginous pygmy-owl is one of four subspecies of the ferruginous pygmy-owl.

The cactus ferruginous pygmy-owl's historic habitat extends from southern central Arizona south to the Mexican states of Colima and Michoacan, and from southern Texas to the Mexican states of Tamaulipas and Nuevo Leon. The Arizona populations of the pygmy-owl proposed for designation of critical habitat reside in a number of the state's woodland communities, including riverbottom woodlands, woody thickets or "bosques," and Sonoran desertscrub. The pygmy-owl generally resides at elevations below 4,000 feet.

Riparian woodlands or woody drainages in desert uplands and grasslands are a key element of the pygmy-owl's habitat, as they support trees or cacti large enough to provide nesting sites. The pygmy-owl's primary habitats formerly included riparian cottonwood forests, mesquite bosques, and Sonoran desert, but the species currently is found primarily in Sonoran desertscrub with palo verde, bursage, ironwood, mesquite, acacia, and saguaro cacti. Suitable habitat for the pygmy-owl is believed to exist or be able to exist, in habitats supporting riparian forests, riverbottom woodlands, xeroriparian forests, plains, and semi-desert grasslands, and the Arizona upland subdivision of the Sonoran desertscrub. These habitats are believed to support or to be able to support the aforementioned specific plant communities suitable for pygmy-owl habitat.

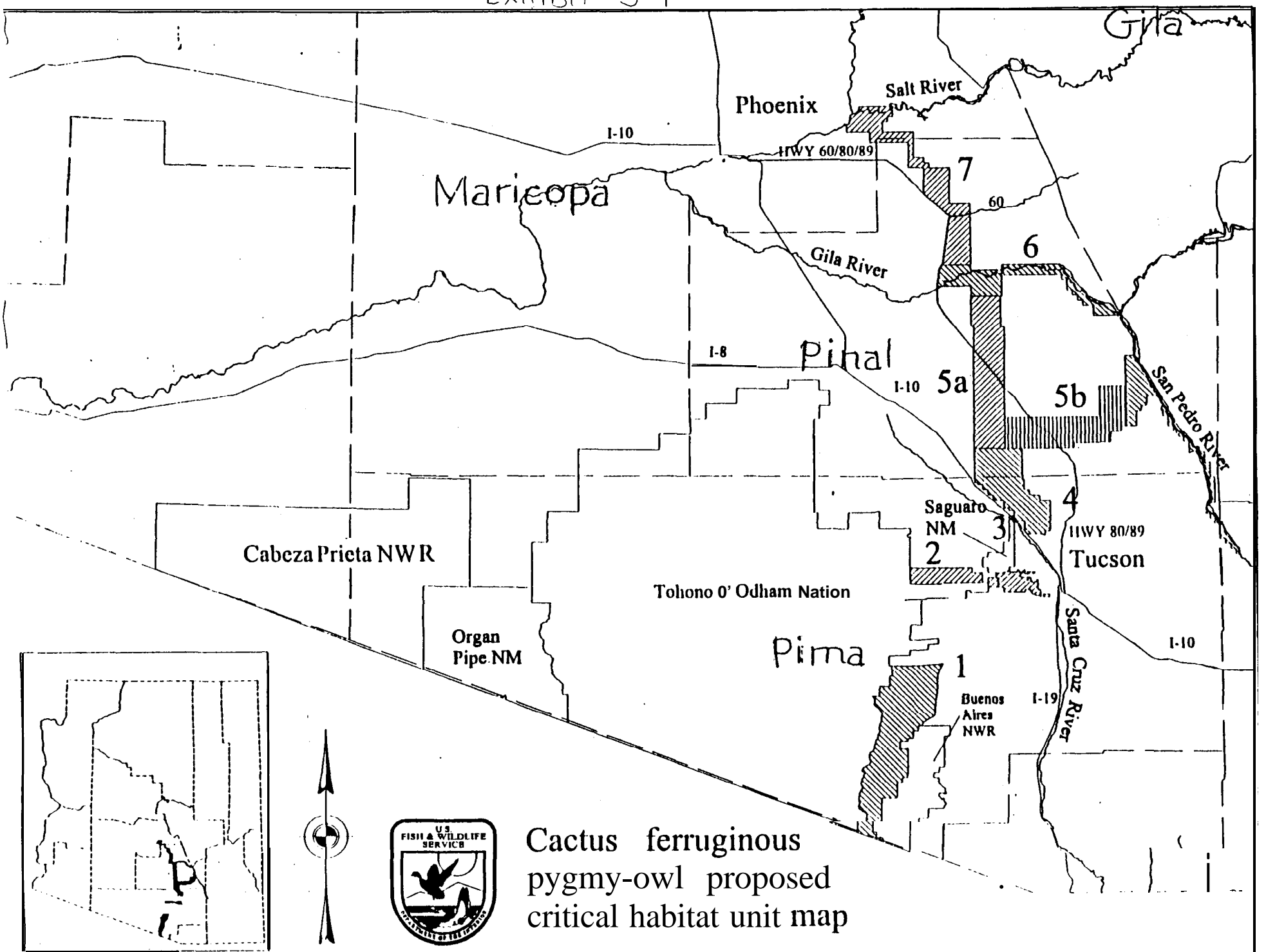
³ The information on the pygmy-owl and its habitat included in this section was obtained from the *Proposed Determination of Critical Habitat for the Cactus Ferruginous Pygmy-Owl*, December 30, 1998 (50 CFR Part 17).

Geographical Background on Proposed Critical Habitat Units

FWS has proposed eight units in southwestern Arizona for critical habitat designation for the pygmy-owl. FWS's proposed critical habitat units attempt to form an interconnected system of suitable and potential habitat for the species. All units proposed for critical habitat designation for the pygmy-owl are within geographical areas historically or presently occupied by the species, and are in current need of special management considerations or protection, as required under Section 3 of the ESA. Lands already believed to offer adequate protection for the pygmy-owl, such as National Park lands or National Monument lands, were excluded from critical habitat designation. Any existing significant structures within the critical habitat area, such as roads, buildings, and aqueducts, which do not contain the constituent elements necessary to support this species, are not considered to be critical habitat.

Exhibit 3-1 displays all eight units proposed as critical habitat designation for the pygmy-owl; more detailed maps of each unit are provided in Appendix A. As shown, the eight units are located in the southern and central counties of Pinal, Pima, Maricopa, and Cochise. Extending from just southeast of the greater Phoenix region to along the San Pedro River into Cochise County to the Arizona border with Mexico near Sasabe, the units form a corridor allowing for dispersal movement of the pygmy-owl. The proposed eight units follow geographical boundaries where possible, although land ownership boundaries preclude total adherence to geographical boundaries. Ranging from 2,460 acres to 159,018 acres per unit, all eight units of critical habitat together comprise 733,786 acres. These areas consist of land owned or managed by:

- U. S. Department of Agriculture
- Forest Service
- U. S. Department of the Interior
- Bureau of Land Management
- Bureau of Reclamation
- Bureau of Indian Affairs
- U. S. Department of Defense
- Arizona State Land Department
- Pima County, Parks and Recreation Department
- Private Owners



Cactus ferruginous pygmy-owl proposed critical habitat unit map

Unit 1

Unit 1 lies entirely within Pima County, southwest of Tucson. It includes a 159,018 acre parcel of land located east of the Baboquivari Mountains between the Buenos Aires National Wildlife Refuge and the Tohono O'Odham Indian Reservation. Extending south from the Coyote Mountains, Unit 1 stretches to the border with Mexico near the town of Sasabe. Unit 1 is owned or managed by following groups:

- Arizona State Land Department - 125,348 acres
- Bureau of Land Management - 5,894 acres
- Private holdings - 27,776 acres

At lower elevations, the land included in Unit 1 primarily consists of Sonoran savannah grassland, mesquite grassland, and desert shrub. At higher elevations, the desert grasslands give way to more rocky terrain and live oak. The unit is also interspersed with riparian corridors, mostly in the form of small streams, ponds, and mountain canyons. During the summer months, rainwater fills in washes and slight depressions in numerous sites, creating seasonal ponds. The washes of this unit are believed to provide suitable habitat for the pygmy-owl.

An important determinant in proposing Unit 1 as critical habitat was its proximity to the Buenos Aires National Wildlife Refuge, which currently supports pygmy-owls. The creation of a habitat corridor adjacent to the National Wildlife Refuge would extend the suitable habitat for the pygmy-owl population in the refuge. Moreover, the border with Mexico created by Unit 1 may provide additional opportunities for demographic and genetic interchange with the Mexican populations of the owl. Recently, several new pygmy-owl sites have been found in this Unit.

Unit 2

This unit forms a link between the potential pygmy-owl habitat on Tohono O'Odham Indian Reservation to the south and west, the Saguaro National Park to the north, and the Tucson Mountain County Park to the east. Located in Pima County due west of the city of Tucson, Unit 2 totals 47,078 acres and contains land managed by the following groups:

- Arizona State Land Department - 8,547 acres
- Private holdings - 1,662 acres

- Bureau of Reclamation - 2,880 acres⁴
- Bureau of Land Management - 15,880 acres
- Pima County, Parks and Recreation Department - 18,109 acres

Located just east of the Roskuge Mountains and immediately north of the Garcia Strip, the pygmy-owl habitat in Unit 2 generally consists of Sonoran desertscrub and mesquite bosques, with Saguaro cacti among the predominant vegetation. The desert lands of Unit 2 are interspersed by several washes, as well, offering suitable habitat for the pygmy-owl.

Unit 3

Unit 3 serves to connect the pygmy-owl habitat in Unit 2 and the adjacent Saguaro National Park with Unit 4, which contains the highest identified concentration of pygmy-owls in Arizona. Unit 3 is located in Pima County, within the greater Tucson area, just northwest of the city proper. The 2,460 acres designated for Unit 3 lie adjacent to a section of Highway 10 near the towns of Rillito and Cortaro, and extend southward for four miles. Unit 3 features Sonoran desertscrub similar to lands in Unit 2, but to a lesser extent because of residential and commercial development. Land in this unit is owned or managed by the following two groups:

- Private holdings - 2,420 acres
- Department of Defense - 40 acres

Unit 4

Unit 4 forms a habitat corridor that encompasses several towns in Pima County northwest of the center of Tucson. The unit joins Unit 3 at Interstate 10 near the towns of Rillito and Cortaro. From here, the critical habitat extends south to Cortaro Road, east to La Cholla Boulevard, and

⁴ The 2,880 acres held by Bureau of Reclamation correspond to a wildlife mitigation corridor established for the Central Arizona Project's Tucson Aqueduct. The 2,880 acres appear on the Unit 2 map in Appendix 1 as private holdings. The private property acreage for Unit 2 listed in this report (1,662 acres) reflects the difference between the 4,542 acres listed on the map and the 2,880 acres held by Bureau of Reclamation.

continues north until the border with Pinal County. Unit 4 extends into Pinal County for several thousand acres, roughly stretching from the town of Red Rock to Catalina State Park. Of the 84,883 total acres in Unit 4, ownership or management of land is divided as follows:⁵

- Arizona State Land Department - 38,617 acres
- Bureau of Land Management - 5,968 acres
- Private holdings - 40,298 acres

The proposed critical habitat contains stands of ironwood and saguaro, and mesquite bosques, as well as several washes. Current information indicates that the designated area supports the most contiguous currently occupied pygmy-owl habitat. In the immediate Tucson area, however, and to the south of Unit 4, very little suitable habitat remains due to residential, commercial, and agricultural development.

Unit 5a

Unit 5a forms a corridors connecting the pygmy-owl habitat northwest of Tucson to riparian habitats along the Gila River. The area totals 112,848 acres and extends directly north from its boundary in Pinal County with Unit 4 to just south of the Gila River, east of Florence. Land holdings in Unit 5a are divided according to the following:

- Arizona State Land Department - 57,141 acres
- Bureau of Land Management - 52,643 acres
- Private holdings - 3,064 acres

⁵ Unit 4 also includes a section of the Central Arizona Project's Tucson Aqueduct, managed by the Bureau of Reclamation. This canal is not represented on the Unit 4 map included in Appendix A. No information was available on the exact acreage and location of the canal at this time. Therefore, no adjustments have been made to BLM, Arizona State Land Department, or private holdings.

The proposed Unit 5a supports desertscrub and woodland areas and is thought to contain upland habitat suitable for the pygmy-owl. Historically, pygmy-owl populations were present in the designated unit. Unit 5a is important to the pygmy-owl critical habitat designation in southern Arizona because it provides a linkage allowing demographic and genetic connectivity and exchange between known existing pygmy-owl populations in northwest Tucson and riparian habitats along the Gila River and further north.

Unit 5b

Similar to Unit 5a, Unit 5b forms a corridor that connects the pygmy-owl habitat northwest of Tucson to riparian habitats along the San Pedro River. Unit 5b totals 98,272 acres and extends east from the northern edge of Unit 4 across southeastern Pinal County, encompassing lands in and around Oracle. The unit ends just west of the San Pedro River, and includes the following holdings:

- Arizona State Land Department - 91,542 acres
- Private holdings - 6,730 acres

The proposed Units 5b supports grassland with mesquite-lined washes. Unit 5b provides linkage between known pygmy-owl populations in northwest Tucson and riparian habitats along the San Pedro River.

Unit 6

Unit 6 parallels riparian habitats along the Gila and San Pedro Rivers in Pinal, Pima, and Cochise Counties. Totaling 130,735 acres, the proposed critical habitat includes woodland habitats along a portion of the Gila River extending from Florence to its intersection with the San Pedro River at Hayden. From there, Unit 6 continues south through woodland habitats of the San Pedro River, cutting across the northeast corner of Pima County before extending into Cochise County for a few miles. The unit includes land held by the following:

- Arizona State Land Department - 56,046 acres
- Bureau of Land Management - 10,220 acres

- Bureau of Indian Affairs - 219 acres⁶
- Bureau of Reclamation - 8,716 acres
- Department of Defense - 3,851 acres
- Private holdings - 51,683 acres

Unit 6 appears to contain suitable habitat for the pygmy-owl based on historical records identifying the species along the rivers, in addition to documentation from the 1980s of pygmy-owl populations inhabiting woodland areas of the lower San Pedro River. The area's riparian woodland vegetation, upland habitat, and Saguaro cacti present along the Gila and San Pedro Rivers are believed to provide adequate habitat for the pygmy-owl. Furthermore, the riparian habitat provides an important corridor to suitable pygmy-owl habitat to the north.

Unit 7

Unit 7 extends from the northwestern corner of Unit 6, along the Gila River near Florence, to just southeast of greater Phoenix. From Florence, Unit 7 continues north and slightly east until crossing the border into Maricopa County near Apache Junction. From there, Unit 7 extends for several thousand acres and includes an area along the Salt River. The 98,492 acres in Unit 7 include land held by following:

- Arizona State Land Department - 57,410 acres
- Bureau of Land Management - 678 acres
- Forest Service - 38,380 acres
- Private holdings - 2,024 acres

⁶ Comments received from the Bureau of Indian Affairs (BIA) indicate that BIA owns 13,000 acres of land in Units 5b and 6, located approximately between Florence and the confluence of the Gila and San Pedro Rivers. Because this acreage overlaps with reported Bureau of Reclamation and private holdings, contacts were made with agency staff at the Bureau of Reclamation and the BIA to inquire about the ownership of this land. However, further data on land ownership were not available at the time of report publication.

North of the Gila River, Unit 7 primarily supports upland habitats with desert scrub and cacti vegetation. Crossing into Maricopa County, Unit 7 includes the more mountainous desert terrain of the Superstition Wilderness, as well as a riparian woodland community along the Salt River. This riparian woodland area supported significant pygmy-owl populations into the 1970s, and is believed to currently offer suitable habitat for the species. Unit 7 is important to critical habitat designation for the pygmy-owl because it connects the seven other critical habitat units with the Salt River riparian woodlands, an area that has historically supported pygmy-owls.

**IMPACTS OF CRITICAL HABITAT DESIGNATION ON LAND USE:
FEDERAL, STATE, COUNTY AND PRIVATE LANDS**

SECTION 4

The proposed designation of critical habitat for the pygmy-owl includes federal, state, county, and private lands. Critical habitat designation may restrict land uses, activities, and other actions on federally managed land that threaten to adversely modify habitat. In order for activities and land uses on state, county, and private lands to be affected by critical habitat designation, a federal nexus must exist (i.e., the activities or land uses involve a federal permit, federal funding, or require federal actions). Activities on state, county, and private lands that do not involve a federal nexus are not restricted by the designation of critical habitat.

The potential impacts of critical habitat designation for the pygmy-owl on federal, state, county, and private land uses are described below.

IMPACTS OF CRITICAL HABITAT ON FEDERAL LAND

The areas proposed for designation as critical habitat for the pygmy-owl include property held or managed by the following federal agencies:

- U. S. Department of Agriculture
- Forest Service
- U. S. Department of the Interior
- Bureau of Land Management
- Bureau of Reclamation
- Bureau of Indian Affairs
- U.S. Department of Defense

Of the total 733,786 acres of proposed critical habitat, 19 percent (142,489 acres) is held or managed by federal agencies.

Section 7 of the ESA requires consultation for all federal actions likely to have an adverse affect on the species or its critical habitat. Current and planned land uses and activities on federal land that may be affected by designation of critical habitat were identified by reviewing public comments submitted by federal agencies and through phone communication with federal agency staff. According to guidance from FWS staff, critical habitat designation will place no additional restrictions on any of the identified federal land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. Nonetheless, federal agencies remain concerned about the possible impacts of critical habitat designation. Below we describe current and planned land uses and activities, possible federal nexuses, and concerns over impacts for each federal agency with land located in the proposed critical habitat.

U.S. Department of the Interior, Bureau of Land Management

The Bureau of Land Management (BLM) is the largest federal landholder of areas proposed as critical habitat for the pygmy-owl. The BLM owns or manages lands in six of the eight proposed units totaling 91,283 acres. The affected BLM lands are located within Units 1, 2, 4, 5a, 6, and 7, and range in size and topography.

- Unit 1 contains 5,894 acres of BLM land in Pima County, located among tracts of Arizona State Land Department holdings and in between the Buenos Aires National Wildlife Refuge and the Tohono O'Odham Nation tribal land. These lands are primarily a mixture of Sonoran savannah grassland and desert shrub with some riparian corridors.
- Unit 2 includes 15,880 acres interspersed within State Land Department holdings adjacent to Tucson Mountain County Park and Saguaro National Park.
- Unit 4 contains 5,968 acres contained in small parcels scattered among private and State Land Department property in Pinal County just north of Tucson.
- Unit 5a includes 52,643 acres, divided into two large sections on the northern and southern ends of the unit.
- Unit 6 contains 10,220 acres contained in scattered parcels of land set back from the San Pedro River.
- Unit 7 has the least BLM inholdings (678 acres), consisting of two small parcels surrounded by State Land Department property just south of the Maricopa County line in the Superstition Wilderness.

Exhibit 4-1 shows current and proposed BLM land uses based on information obtained from written comments submitted by BLM and from phone conversations with BLM staff. FWS guidance suggests that BLM lands will face no restrictions from critical habitat designation above and beyond existing restrictions under the ESA listing of the pygmy-owl. Each of the BLM land uses and possible restrictions are described in more detail below.

Exhibit 4-1					
U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT: SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION FOR THE CACTUS FERRUGINOUS PYGMY-OWL					
Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Grazing	1, 2, 4, 5a, 6	Grazing permits	Possibly	No	None
Recreation: Dispersed recreation (e.g., hunting, camping, day hiking)	1, 2, 5a, 6	Potential destruction of habitat	Possibly	No	None
Right-of-ways: Road access and utility lines.	4	Permitting for right-of-ways	Possibly	No	None
Land exchange: Proposed exchange of BLM parcels for private or other agency holdings.	5a, 7	Federal action: critical habitat transferred from federal ownership to private or other agency ownership	Possibly	No	None
<p>* Possible restrictions are based on guidance from FWS staff in Phoenix, Arizona office. Sources: (1) Ted Cordery, Bureau of Land Management, personal communication, March 17, 1999; (2) Bureau of Land Management comments received in response to proposed designation of critical habitat, February 26, 1999; (3) Comments from "Public Hearing on proposal to designated critical habitat for the endangered cactus ferruginous pygmy-owl and the Huachuca water umbel," February 12, 1999, Tucson Convention Center, Tucson.</p>					

Grazing

Bureau of Land Management staff report that livestock grazing constitutes the predominant use of BLM lands across the six proposed critical habitat units.⁷ Although FWS guidance suggests that the critical habitat designation will not result in additional restrictions beyond listing restrictions, BLM and private ranchers remain concerned that the designation of critical habitat might affect grazing on BLM lands. The scale and value of current grazing activity in the proposed critical habitat units is characterized below.

BLM leases land to ranchers in grazing allotments that range in size, with most BLM allotments in southeastern Arizona classified as *medium to small*. Licenses are granted for year-long use and tend not to change much over the years. Fees for grazing on these leased lands are calculated using "animal unit months" (AUMs), which equals the number of cattle grazing on a unit of land multiplied by the number of months per year that grazing occurs.

The average density of cattle on BLM land leased for grazing within the critical habitats was estimated by BLM staff at six cows per square mile. The average leasing cost per AUM is estimated at approximately \$1.35, while the average gain per AUM for ranchers is estimated at \$5.50 per AUM.⁸ Exhibit 4-2 shows the estimated benefits of grazing to BLM and private ranchers.

If the proposed critical habitat designation for the pygmy-owl in Arizona led to a restriction of grazing on BLM lands, any restricted lands would need to be fenced. These restrictions would require a large-scale fencing effort. Currently, grazing in Arizona operates under the state's "open range rule," which places the burden on owners, not ranchers, to fence off their lands to protect them from grazing. In effect, property owners adjacent to public or private grazing land must bear the cost of fencing off their land or the land may potentially become "free" grazing land. As permitting procedures differ on federal, state, and private lands, any restrictions on grazing on BLM lands would require the construction of fencing to delineate property lines and keep cattle within permitted areas. Depending on the nature of the restrictions, the cost of fencing could easily exceed the impacted land's grazing value, especially given the scattered nature of the many BLM parcels and the hundreds of miles of boundary perimeters.

⁷ Ted Cordery, Bureau of Land Management, personal communication, March 17, 1999.

⁸ The \$1.35/AUM estimate represents the 1999 federal grazing fee. The \$5.50/AUM gain for ranchers is based on an estimate in FWS "Analysis of the Economic Impacts of Designating Critical Habitat for *Salix arizonica*" by Jon Souder, February 21, 1994.

Exhibit 4-2

**SUMMARY OF ANNUAL GRAZING USE AND VALUE FOR BLM LANDS
WITHIN PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Unit	Acres¹	No. of Square Miles²	Total AUMs³	BLM Revenue⁴	Rancher Benefits⁵	Total Grazing Value⁶
1	5,894	9.2	663	\$895`	\$2,752	\$3,647
2	15,880	24.8	1,787	\$2,412	\$7,414	\$9,826
4	5,968	9.3	671	\$906	\$2,786	\$3,692
5a	52,643	82.3	5,922	\$7,995	\$24,578	\$32,573
6	10,220	16.0	1,150	\$1,552	\$4,771	\$6,323
7	678	1.1	76	\$103	\$317	\$420
Total	91,283	142.7	10,269	\$13,863	\$42,618	\$56,481

¹ The number of acres of grazing is based on BLM acreage per critical habitat unit, on the assumption that grazing occurs on all or almost all BLM land; Ted Cordery, BLM, personal communication.

² One square mile is equal to 640 acres.

³ Based on 72 AUMs (6 cows x 12 months) per square mile; "Eastern Arizona Draft Grazing Environmental Impact Statement, Phoenix and Safford Districts", BLM, Phoenix, September 1985.

⁴ Based on price of \$1.35 per AUM, the 1999 federal grazing fee; Ted Cordery, BLM.

⁵ Based on a gross value to rancher of \$5.50 per AUM minus the price paid to BLM, as reported in FWS "Analysis of the Economic Impacts of Designating Critical Habitat for *Salix arizonica*" by Jon Souder, February 21, 1994.

⁶ Equal to BLM revenue plus rancher benefits.

Recreation

Dispersed recreation is estimated as the second most important use of BLM managed land included in the proposed designation. BLM staff report that Units 1, 2, 4, 5a, and 6 provide recreational use of various types. The most common recreational activities in Units 1, 2, 5a, and 6 include hunting, camping, day hiking, and picnicking in areas that are accessible by vehicle. In addition to these activities, Unit 6 supports recreational tubing and rafting on the Gila River. BLM land in Unit 4 supports less recreational activity, including tighter restrictions on hunting, but does support some day-use recreation. The BLM receives no payment for recreational use of the lands or roads, and all recreational activities are unmanaged. As such, the BLM has no estimates of total use or visitor counts for lands in these units.

Right-of-ways

BLM land within the proposed critical habitat currently includes several right-of-ways. Most of these right-of-ways reflect utility lines or access roads and are concentrated in Unit 4. Estimates of the number and value of right-of-ways on BLM property were not available. BLM staff report, however, an expected rise in the demand for right-of-ways on BLM property, in particular in designated areas near Tucson and Apache Junction.

Land Exchanges

Land exchanges or "land disposals" comprise a third activity important in evaluating the potential effects of critical habitat. Under a land exchange, BLM may sell or exchange a portion of their current holdings for land owned by private, state, or federal parties. BLM personnel indicate that the most common transaction is a "common land exchange" with another federal agency. In the case of a land exchange with a private owner, the private landowner typically owns inholdings and seeks to exchange them for land more suitable for development.

A substantial number of acres of BLM land within the proposed critical habitat are identified as candidates for land exchange. These parcels include:

- 1,240 acres in Unit 1
- 1,200 acres in Unit 2
- 5,968 acres in Unit 4 (all)
- 52,643 acres in Unit 5a (all)
- 4,000 acres in Unit 6
- 40 acres in Unit 7

Although these lands have been identified as potential candidates for disposal, BLM often chooses not to dispose of such lands for reasons of public interest. Thus, only a fraction of lands identified for exchange may eventually change ownership.

Even if critical habitat designation results in no additional restriction on BLM land uses, BLM remains concerned that the designation may reduce the Bureau's ability to exchange land due to public perception about critical habitat areas. Public perception of the implication of critical habitat may affect BLM land exchanges, as well as State Land Department and private real estate transactions. Public perception impacts are addressed in a separate section of the report (see "Impacts Due to Public Perception").

U. S. Department of Agriculture, Forest Service

The United States Forest Service (USFS) manages a total of 38,380 acres of land proposed as critical habitat for the pygmy-owl, all of which is in the southwest corner of the Tonto National Forest in Unit 7. The northern edge of the proposed habitat lies in Maricopa County and runs along the Salt River for approximately 10-15 miles near the junction of the Salt and Verde Rivers. From there, the proposed area extends south and east, straddling the border between Maricopa and Pinal Counties for approximately 10 miles before dropping into Pinal County.

The designated areas of Tonto National Forest lie within the Superstition Wilderness Area and include desert mountain terrain, abundant flora including the Saguaro cactus, and a wide range of wildlife. The geographical attractiveness and proximity of the southwest corner of the National Forest to Phoenix have led it to become a popular recreational area.

Exhibit 4-3 summarizes the current and proposed projects in the Tonto National Forest identified by USFS staff as potentially being affected by the designation of critical habitat. According to guidance from FWS staff, designation of critical habitat will place no restrictions on these land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. More detailed descriptions of the current and proposed uses of Tonto National Forest lands are provided below.

Exhibit 4-3					
U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE: SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION FOR THE CACTUS FERRUGINOUS PYGMY-OWL					
Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Recreation: Light, dispersed recreation (e.g., tubing, day-hiking, picnicking); Move a 200-car parking lot to a new, adjacent location in Tonto National Forest	7	Potential destruction of habitat; clearing of vegetation	Possibly	No	None

* Possible restrictions are based on guidance from USFWS staff in Phoenix, Arizona office.
Source: Eddie Alford, Tonto National Forest Headquarters, personal communication, March 12, 1999.

Recreation

Tonto National Forest supports a wide array of recreational uses in the 38,380 acres proposed for critical habitat designation.⁹ One of the primary recreational destinations within the area is the Salt River, where activities include tubing, rafting, fishing, camping, and sightseeing. No estimates of recreational use for this area were available. USFS staff report that one river outfitter currently holds a right-of-way on National Forest land, in order to access the Salt River. While there are no existing proposals to expand the infrastructure and/or access to the wilderness area, Forest Service staff indicate that there is a proposal in place to relocate an existing parking lot. This effort would involve relocating a parking lot servicing a campground along the Salt River in order to remove it from the river drainage. The parking lot holds approximately 200 cars and will need to be relocated a few hundred feet away to adequately remove it from the river drainage. To complete this operation, the USFS will need to clear vegetation.

Outside of the Salt River Canyon, recreational opportunities on land managed by the USFS within the proposed critical habitat designation include camping, hiking, and horseback riding. There are currently no plans to further develop existing trail systems. There are no designated areas for use of motorized recreational vehicles, although USFS personnel report that occasional unauthorized use does occur. Tonto National Forest does not currently have any plans to construct new roads or facilities in support of recreation.

U.S. Department of the Interior, Bureau of Reclamation

Based on FWS estimates, public comments submitted by the Bureau of Reclamation, and phone conversations with Bureau of Reclamation staff, the proposed critical habitat for the pygmy-owl includes the following Bureau of Reclamation lands:¹⁰

- Unit 2 -- A section of canal surrounded by 4.5 square miles (2,880 acres) of "mitigation corridor" adjacent to Tucson Mountain County Park.
- Unit 4 -- a section of canal (roughly 570 acres) along the western edge of the designated area in Pima County.
- Unit 6 -- 8,716 acres along the Gila River near Kelvin, Arizona.

⁹ Eddie Alford, USFS, Tonto National Forest Service, personal communication, March 12, 1999.

¹⁰ Bruce Ellis and Henry Messing, Bureau of Reclamation, personal communication, March 12, 1999; Reclamation comments submitted on proposed critical habitat designation for the Pygmy-Owl, February 16, 1999.

Exhibit 4-4 shows current and proposed activities identified by Bureau of Reclamation staff as potentially being affected by designation of critical habitat. According to guidance from FWS staff, critical habitat designation will place no additional restrictions on activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. Detailed descriptions of current and proposed Bureau of Reclamation activities that may impact critical habitat are included after the exhibit.

Exhibit 4-4					
U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION: SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION FOR THE CACTUS FERRUGINOUS PYGMY-OWL					
Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Aqueduct: Maintenance of structure and land surrounding canal.	2, 4	Regular clearing of vegetation within 25 feet alongside canal	Possibly	No	None
<p>* Possible restrictions are based on guidance from FWS staff in Phoenix, Arizona office. Sources: (1) Bruce Ellis and Henry Messing, Bureau of Reclamation, personal communication, March 12, 1999; (2) Bureau of Reclamation comments submitted on proposed critical habitat designation for the Pygmy-Owl, February 16, 1999.</p>					

Aqueduct

The Bureau of Reclamation has identified a stretch of the Central Arizona Project's Tucson Aqueduct within areas delineated as Units 2 and 4 of the proposed critical habitat. Although the Bureau of Reclamation holds the title to these lands, the Central Arizona Water Conservation District maintains operation, maintenance, and administrative responsibilities for the aqueduct. The aqueduct consists of a concrete lined canal, a protective dike on the upslope of the canal, and areas of land on both sides of the canal providing maintenance and access roads, as well as temporary storage for storm water runoff. The areas to either side of the canal extend, on average, 100-200 feet back from the canal, and typically feature heavy vegetation due to periodic water run-off. As part of the Central Arizona Project Right-of-Way Land Use Policy, the District is granted the right to clear vegetation within 25 feet of the canal in order to aid the flow of water through the canal and to maintain the structure of the canal embankments. The Bureau of Reclamation is concerned that final designation of these lands as critical habitat would prevent the District from complying with its routine operations and management to clear vegetation along the canal.

Proposed Dam Site

According to Bureau of Reclamation staff, Bureau of Reclamation land in Unit 6 corresponds to a site designated under the Central Arizona Project for the construction of a dam. Authorized in 1968 as the proposed site for construction of Butte's Dam, the project was never initiated and is currently inactive. The land is still authorized as a potential dam site, but there are currently no plans to construct the dam or develop the 8,716 acres set aside for the project. While the land is held in title by the Bureau of Reclamation, the BLM currently manages the land, and the Bureau of Reclamation reports that the land is not actively being used. No fees are collected by the Bureau of Reclamation for use of the land.

Mitigation Corridor

The Bureau of Reclamation identified a 4.5 square mile (2,880 acres) parcel of land adjacent to Tucson Mountain County Park, originally purchased for Bureau of Reclamation mitigation efforts to restore wildlife habitat losses. The land is currently managed by the Pima County Parks and Recreation Department, which holds an agreement with Bureau of Reclamation to develop the land for low impact recreational opportunities in conjunction with Tucson Mountain County Park activities. As discussed below (see "Impacts of Critical Habitat on County Land"), there is currently one recreational trail running through the mitigation corridor parallel to the canal. Park staff report that there are no proposed plans to expand the recreational trail system within the mitigation corridor. All proposed development of new trails will take place within Park owned property. Other identified activities and land uses in the mitigation corridor include several existing right-of-ways for utility companies and two wildlife water catchments.

U.S. Department of the Interior, Bureau of Indian Affairs

The proposed critical habitat for the pygmy-owl includes 219 acres of land identified as Indian Allotments. The parcels are located within Unit 6, between Hayden and Dudleyville, along the San Pedro River. Staff at the Bureau of Indian Affairs (BIA) report that these lands are classified as Public Domain Allotments and are held in trust by the BIA for Native Americans.¹¹ According to BIA personnel, the designated Indian Allotments were given to members of Native American tribes decades ago and have since been passed down through family heirs. The allotments in Unit 6 are currently held by descendants of the San Carlos Apache Tribe.¹²

¹¹ Diana Halbert, San Carlos Agency, Bureau of Indian Affairs, personal communication, March 15, 1999.

¹² Mike Smith, San Carlos Agency, Bureau of Indian Affairs, personal communication, March 16, 1999.

BIA staff report that the 219 acres are managed by individual Native Americans, and that BIA is not involved in regular management or maintenance of the lands. BIA is involved in activities on the land only in cases of consultation for actions requiring federal permitting. According to BIA, no one currently resides on the designated Indian Allotments and the lands are primarily used for hunting, fishing, gathering of firewood in mesquite bosques, and other traditional gathering activities.¹³ There are no proposals for further activity on the allotments identified by the BIA.

BIA reports that 13,000 acres of land in Units 5b and 6 are owed by the San Carlos Irrigation Project (SCIP), an entity within BIA that provides irrigation water and electric power to the Gila River Indian Reservation and private lands in Pinal County. According to SCIP, they maintain 13,000 acres, including irrigation fields in Unit 6 between Florence and Hayden, and electric transmission and distribution lines in Units 5b and 6. SCIP is concerned that the designation of critical habitat may have a significant economic impact on their operations. As activities on SCIP lands are considered federal actions, SCIP is concerned that critical habitat will impose restrictions on year-round activities including maintenance of facilities, construction of new power lines, and emergency repair of facilities. According to SCIP, restrictions and impacts to these activities will increase the cost of the electric service they provide.¹⁴

Exhibit 4-5 summarizes the current and proposed activities on BIA/SCIP land that SCIP staff identified as potentially being affected by critical habitat. According to guidance from FWS staff, designation of critical habitat will place no restrictions on these activities above and beyond restrictions that already exist under the ESA listing.

¹³ Pierre Cantou, Phoenix Regional Office, Bureau of Indian Affairs, personal communication, March 17, 1999.

¹⁴As stated in Section 3, the 13,000 acres reported by BIA overlaps with reported Bureau of Reclamation and private holdings. Contacts were made with agency staff at BIA and Bureau of Reclamation, but further data on land ownership were not available at the time of report publication.

Exhibit 4-5

**U.S. DEPARTMENT OF THE INTERIOR: BUREAU OF INDIAN AFFAIRS
SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Facility maintenance and construction: Routine maintenance of irrigation and power facilities; Construction of new power lines.	5b, 6	Potential destruction of habitat.	Possibly	No	None

* Possible restrictions are based on guidance from FWS staff in Phoenix, AZ office.
Source: Comments submitted by San Carlos Irrigation Project (BIA) in response to "Draft Economic Analysis of Critical Habitat Designation for the Cactus Ferruginous Pygmy-Owl," May 14, 1999.

U.S. Department of Defense

The areas proposed as designated critical habitat for the pygmy-owl include two parcels of land identified as Department of Defense (DoD) holdings. The first parcel spans the northeast boundary of Unit 6 along the Gila River near Florence, and totals 3,851 acres. The second parcel consists of 40 acres located in Unit 3 just north of Tucson.

Exhibit 4-6 shows current and proposed activities and land uses identified by DoD staff as potentially being affected by critical habitat designation. According to guidance from FWS staff, designation of critical habitat will place no additional restrictions on these activities and land uses above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. More information on current and proposed DoD activities within the proposed critical habitat is included.

Exhibit 4-6

**U.S. DEPARTMENT OF DEFENSE:
SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Military Training: Desert training at Florence Military Reservation.	6	Artillery range located in critical habitat	Possibly	No	None

* Possible restrictions are based on guidance from FWS staff in Phoenix, AZ office.
Source: Chris Pedersen, Natural Resource Management, Arizona Army National Guard, Florence Military Reservation, personal communication, March 16, 1999.

Military Training

The DoD property in Unit 6 is identified as the Florence Military Reservation, managed by the Arizona Army National Guard.¹⁵ The reservation is held under a Federal Executive Order and is used by the Arizona Army National Guard for desert training purposes. It is the Arizona Army National Guard's largest desert training site and is predominantly used as an artillery firing range. Most of the acres proposed as critical habitat in Unit 6 are located within the "impact area" of the artillery range, or the area where the fired shells actually land. According to Army National Guard staff, the Florence Military Reservation continues north of Unit 6 and the Gila River, extending 19,197 acres into Unit 7. These DoD managed lands in Unit 7 are leased from the State Land Department, and are also used for desert training and artillery practice.

FWS geographic information system (GIS) staff identified 40 acres of DoD land in Unit 3. No DoD staff were able to identify the purposes for which this land is used.

¹⁵ Chris Pedersen, Natural Resource Management, Arizona Army National Guard, Florence Military Reservation, Personal communication, March 16, 1999.

IMPACTS OF CRITICAL HABITAT ON STATE LAND

The State of Arizona is the largest owner of lands proposed as critical habitat for the pgymy-owl. Of the total 733,786 acres proposed for designation, 60 percent (434,651 acres) is owned by the Arizona State Land Department. Under agreement at the time of Arizona's entrance to the Union, the state was granted lands to hold in trust for the support of common schools and public institutions such as state hospitals, prisons and universities. Current State Land Department holdings total approximately 9.5 million acres in Arizona, referred to as State Trust Land. At present, revenue from the sale and leasing of State Trust Land and products are divided into fourteen funds for the Department's major beneficiaries.

The State Land Department owns land in all of the units proposed as critical habitat except Unit 3. State Trust land includes:

- Unit 1 -- 125,348 acres between the Tohono O'Odham Nation and the Buenos Aires National Wildlife Refuge.
- Unit 2 -- 8,547 acres interspersed among BLM lands and adjacent to Tucson Mountain County Park.
- Unit 4 -- 38,617 acres north of Tucson spanning Pima and Pinal Counties.
- Unit 5a -- 57,141 acres in Pinal County between Red Rock and Florence.
- Unit 5b -- 91,542 acres in Pinal County near Oracle.
- Unit 6 -- 56,046 acres of scattered parcels along the San Pedro and Gila Rivers.

Current and Planned Uses of State Trust Lands

Uses of State Trust Lands can only be restricted under designation of critical habitat when the activities involve a federal nexus. Sales, leases, and permits for use of State Trust Land do not require any direct federal involvement. A review of current and proposed activities on State Trust

Land was conducted based upon information from comments submitted by the State Land Department, as well as phone interviews with State Land Department staff.¹⁶ An overview of current and planned uses for State Trust Land is provided below.

- **Grazing:** The State Land Department currently maintains 71 different grazing leases in critical habitat Units 1, 2, 4, 5a, 5b, 6, and 7. Grazing allotments range in size and typically have a carrying capacity of 5-8 head of cattle per square mile. State Trust Land grazing allotments are intermingled extensively with federal and private lands. Public comments submitted by the State Land Department indicate concern that designation of critical habitat may threaten grazing on federal lands, in turn threatening the continued existence of grazing on Trust Lands. No data were available estimating the revenue raised for State Trust beneficiaries by grazing permits.
- **Agriculture:** The State Land Department presently maintains eight agricultural leases on State Trust Land. These agricultural sites are predominantly located within Unit 6 of the proposed critical habitat. There are currently no pending applications for agricultural leases of State Trust Land.
- **Right-of-ways:** There are a total of 240 right-of-way easements on State Trust Land, according to State Land Department personnel. The right-of-ways are located across all designated units and easement fees vary substantially. Primary uses for State Trust Land right-of-ways include communications lines, electric distribution lines, water and gas pipelines, roads, and railroads. Total revenue for right-of-way permits is estimated as \$56.3 million over the next 100 years.¹⁷
- **Commercial/Residential Leases:** According to State Land Department staff, commercial leases produce the most revenue for Department beneficiaries. The leases for commercial use reported by Department staff are located in Units 1, 4, 5b, 6 and 7. They range from utility and water

¹⁶ Public comments submitted by Arizona State Land Department are dated March 1, 1999; Phone interviews were conducted with Michael Anable, Arizona State Land Department on March 30, 1999, and Paul Palley, Arizona State Land Department, April 2, 1999.

¹⁷ An annual estimate of revenue from right-of-way billings was not available from the Arizona State Land Department.

commercial sites to residential communities and retail businesses. Revenue from commercial leases is estimated to roughly equal \$184.7 million over the next 100 years.¹⁸

- **Mining Leases:** State Land Department records indicate four mining leases located in Unit 6 near the San Pedro River. No data were available estimating the revenue raised for State Trust Land beneficiaries by mining leases. There are currently no applications pending for additional mining permits.
- **Special Use Permits:** The State Land Department currently maintains 45 "special use permits," characterized as shorter term permits used for a wide range of activities. Special use permits are located in all seven of the critical habitat units containing State Trust Land. Special use permits allow for a variety of land uses including apiaries, municipal utilities, homesites, parking, grazing, and military training. One military training special use permit involves the northernmost 17,836 acres of the Florence Military Reservation. The reservation extends north of the Gila River and comprises the southern end of Unit 7. As mentioned above, the Florence site is managed by the Arizona Army National Guard and is used for desert training and includes an artillery range (see "Department of Defense" above). State Land Department staff records indicate that there are seven applications pending for special use permits.

Impacts to State Trust Land Due to Public Perception of Critical Habitat Designation

Although a direct federal nexus may not exist for State Trust Land sales, leases, and permitting, the State Land Department remains concerned these transactions may be affected by critical habitat if land uses *planned* by potential State Trust Land buyers, lessees, and permittees would involve a federal nexus. For example, potential applicants for right-of-ways may decide not to apply if their plans were to build roads that would be subject to a federal nexus (e.g., Section 404 permitting).

According to guidance from FWS staff, designation of critical habitat will not place any additional restrictions on uses of State Trust Land above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. Nonetheless, the State Land Department remains concerned about how public perception of critical habitat, regardless of actual restrictions under critical habitat designation, may result in reduced State Trust Land property values and decreased transactions of State Trust Land leases and permits. Because public perception of critical habitat may affect State Trust Land, as well as federal land exchanges and private real estate transactions, public perception

¹⁸ An annual estimate of revenue from commercial leases was not available from the Arizona State Land Department.

impacts are addressed in a separate section of the report (see "Impacts Due to Public Perception").

IMPACTS OF CRITICAL HABITAT ON COUNTY LAND

Unit 2 of the proposed critical habitat for the pygmy-owl includes the Tucson Mountain County Park, approximately 18,000 acres of park land owned and managed by Pima County's Parks and Recreation Department. The park is located due west of the center of Tucson and just south of the Saguaro National Park. Adjacent to the park, but managed and maintained as an extension of Tucson Mountain County Park, is a 4.5 square mile (2,880 acres) mitigation corridor for the Central Arizona Project's Tucson Aqueduct, held in title by the Bureau of Reclamation. The park and the mitigation corridor together offer approximately 23,000 acres of land for a wide variety of recreational uses and receive an estimated annual visitation of 1.2 million people.

Activities on lands owned by the County can only be restricted under designation of critical habitat when the activities involve a federal nexus (i.e., federal permits, federal funding, or other federal actions). Exhibit 4-7 shows planned projects in Tucson Mountain County Park that may involve a federal nexus. These projects were identified based on information provided by Park staff.¹⁹ According to guidance from FWS staff, designation of critical habitat will place no additional restrictions on these land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl.

Trail Construction

Many of Tucson Mountain County Park's recreational activities take place on the Park's 30 mile trail network, including hiking, biking, and horseback riding. The Park is proposing to expand the existing trail network, although a final plan for trail expansion is not yet complete. The proposed expansion may require Section 404 permits and Section 401 permits. Although part of the Park's trail system runs parallel to the Tucson Aqueduct through the Bureau of Reclamation's mitigation corridor, the Park has no plans to expand the trail system within this Federally owned mitigation corridor.

¹⁹Gale Bundrick, Pima County, Parks and Recreation Department, personal communication, April 1, 1999.

Exhibit 4-7

**PIMA COUNTY, PARKS AND RECREATION DEPARTMENT:
SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE CACTUS FERRUGINOUS PYGMY-OWL**

Description of Current and Planned Land Uses or Activities That May Impact Suitable or Occupied Habitat	Critical Habitat Unit(s) Potentially Affected	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?*	Additional Restrictions Under the Proposed Critical Habitat Designation?*	Estimated Impacts From Critical Habitat Designation Only?
Trail construction: Expansion of park trail network.	2	Section 404 permit (i.e., to relocate or fill soil in or around watersheds); Section 401 permit	Possibly	No	None
Facility improvements: New restroom facilities, new visitors center, and upgrade of park water system	2	Section 404 permit (i.e., to relocate or fill soil in or around watersheds); Section 401 permit	Possibly	No	None

* Possible restrictions are based on guidance from FWS staff in Phoenix, AZ office.
Source: Gale Bundrick, Pima County, Parks and Recreation Department, personal communication, April 1, 1999.

Facility Improvements

In addition to proposed expansion of the Tucson Mountain County Park trail network, Park staff indicate a number of other planned improvements to the Park's facilities that might require Section 404 and Section 401 permitting. The first project involves the construction of new restroom facilities within the park. The second involves the construction of a new visitor's center at the Gilbert Ray campground. The third project calls for an upgrade of the park's current water system. While plans for this upgrade are not yet final, Park personnel indicated that the improvements would likely include a larger storage tank and new, larger water lines. The third project is of particular importance to the Park because currently the entire Park is served by a single water system.

Other Land Uses and Activities within the Park not Involving a Federal Nexus

In addition to 30 miles of trails, Tucson Mountain County Park offers three large picnicking areas, an RV and tent campground, an archery range, and a shooting range. The archery range is

comprised of one range of archery stations and three archery courses, totaling approximately 250 acres. There is a fee for use of the range that generates annual revenue of about \$3,500.²⁰ The shooting range totals 300 acres and generates annual revenue from fees of about \$8,000 per year.²¹ Archery hunting of mule deer and javelina is also permitted on park property, although the park receives no revenue from hunting activity.

Tucson Mountain County Park also maintains three leases to groups who use the land for educational and entertainment purposes. The first lease is to the Arizona-Sonoran Desert Museum, a 100-acre non-profit facility open to the public and offering natural history exhibits, a botanical garden, and a small zoo. The museum leases the property for \$1 per year from the County Park. The second lease is for the 350-acre amusement park "Old Tucson," which leases the land for approximately \$350,000 per year. The third lease is to the Sonoran Arthropod Society, which maintains a private educational facility on 50 acres of Park property, leased at \$5 per year. Tucson Mountain County Park staff do not report any proposed projects to increase or expand activities on leased land.

IMPACTS OF CRITICAL HABITAT ON PRIVATE LAND

Private landholders own 135,657 acres, or 18 percent, of the 733,786 acres of land proposed as critical habitat for the pygmy-owl. In order for private land uses or activities to be affected by the proposed designation of critical habitat, a federal nexus must exist (i.e., land uses or activities that involve federal permits, federal funding, or other federal actions). For example, private developers may require a Section 404 permit issued by the U.S. Army Corps of Engineers if development includes building across desert washes. Activities on private lands that do not involve a federal nexus are not affected by the designation of critical habitat.

Privately owned land located in the proposed critical habitat is distributed across the eight critical habitat units as follows:

- Unit 1 — 27,776 acres
- Unit 2 — 4,542 acres
- Unit 3 — 2,420 acres
- Unit 4 — 40,298 acres

²⁰ Estimates provided by Gale Bundrick, Pima County, Parks and Recreation Department, personal communication, April 1, 1999.

²¹ Estimates provided by Gale Bundrick, Pima County, Parks and Recreation Department, personal communication, April 1, 1999.

- Unit 5a — 3,064 acres
- Unit 5b — 6,730 acres
- Unit 6 — 51,683 acres
- Unit 7 — 2,024 acres

Exhibit 4-8 shows the potential impacts from the proposed critical habitat designation raised in public comments, public hearings, and phone conversations by private landowners, building associations, and mining companies. According to guidance from FWS staff, critical habitat designation will place no additional restrictions on these land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. A more detailed discussion of these current and proposed private land uses, possible federal nexuses, and private landowner concerns about economic impacts is provided.

Exhibit 4-8				
PRIVATELY OWNED LANDS: SUMMARY OF IMPACTS UNDER THE PROPOSED CRITICAL HABITAT DESIGNATION FOR THE CACTUS FERRUGINOUS PYGMY-OWL				
Description of Current and Planned Land Uses or Activities That May Have an Impact on Suitable or Occupied Habitat	Possible Federal Nexus	Possible Restrictions Under the ESA Listing?	<i>Additional</i> Restrictions Under the Proposed Critical Habitat Designation?	Estimated Impacts From Critical Habitat Designation Only?
Current and planned land development	Section 404 permit; Section 401 permit; FHA funding	Possibly	No	None
Current and planned mining activity	Section 404 permit; Section 401 permit	Possibly	No	None
* Possible restrictions are based on guidance from FWS staff in Phoenix, AZ office. Source: Public comments received in response to the proposed critical habitat designation for the pygmy-owl.				

Current And Planned Land Development

A commonly voiced concern raised by the public in response to the proposed critical habitat designation for the pygmy-owl is the designation's potential impact on the allowable *density* of future development. Private landowners, building associations, and community representatives are

concerned that land within the boundaries of the proposed critical habitat will be restricted to low density development (i.e., one unit per three to four acres), whereas they suggest that without the designation the land would be developed at high densities (i.e., three to four units per acre). Numerous public comments contend that this reduction in the density of development will result in reduced property values, as well as a host of other economic impacts including lost tax revenues, lost jobs, and foregone economic activity. Based on public comments and phone conversations with building associations and county planning staff, most of these impacts would occur in Units 3 and 4, the geographic areas expecting the most private development in the future.

As noted previously, FWS guidance indicates that critical habitat designation for the pygmy-owl will place no additional restrictions on land uses and activities above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. Therefore, economic impacts resulting from lower density development, if occurring, would be due to restrictions under the listing rather than critical habitat designation. Nonetheless, because of the number of public comments citing economic impacts associated with the allowable density of future development, these impacts are addressed in more detail below. *It must be emphasized that none of the impacts reviewed below would be due to critical habitat designation restrictions.*

Of the public comments received on allowable density of future development, the most detailed assessment of impacts was provided in a study conducted by Elliott D. Pollack and Company and submitted as public comment from the Southern Arizona Homebuilders Association. The Pollack study assesses impacts for about 60,000 acres of privately owned land located in Units 1, 2, 3, and 4, and 6, with a focus on 15,000 acres in Units 3 and 4.²² The study concludes that critical habitat designation for the pygmy-owl would result in the following losses over 15 years:

- \$335 million in losses due to reduced property values
- \$193 million in lost tax revenue to the Town of Marana
- \$254 million in lost tax revenue to Pima County
- \$8.5 billion in total economic losses to the region due to lost construction
- 105,966 person-years of lost employment directly or indirectly associated with lost construction

²² Elliott D. Pollack and Company, "The Economic and Fiscal Impact of the Designation of 60,060 Acres of Privately Owned Land in Pima County, Arizona as Critical Habitat for the Cactus Ferruginous pygmy-owl," prepared for Southern Arizona Homebuilders Association, February 25, 1999.

All of the impacts estimated in the Pollack study flow from the assumption that 15,000 acres of private land in Pima County and the Town of Marana would ultimately be developed at high densities, but due to critical habitat designation the land will be developed at low densities. If the impacts summarized above were to occur, they would clearly be significant, but as noted they would be due to restrictions under the ESA listing rather than critical habitat designation.

A close examination of the potential impacts raised in the Pollack study reveals a number of flaws in the study's methodology and assumptions, the three most important of which are described below. Correcting these three flaws would significantly reduce the study's estimated impacts. To illustrate the study's shortcomings, information is presented on current zoning in Pima County provided by the Pima County Administrator's Office. Given that the purpose here is illustration, other counties and incorporated areas, which may have different zoning rules, were not contacted.

- 1. The baseline assumption that private land in Pima County would be developed at high densities, if not for critical habitat designation, is incorrect. This land is currently zoned for low density development; there is no guarantee that the land will ever be zoned for high density development. Property value estimates and economic impacts should be based on the land's current zoning for low density development.***

As shown in Exhibit 4-9, about 80 percent of the Pima County's private land in Units 3 and 4 is currently zoned for low density development (one unit per 4.16 acres or one unit per 3.3 acres). Other Pima County private land located in proposed critical habitat Units 1, 2, and 6 is almost entirely zoned for low density development. Moreover, it should be noted that Exhibit 4-9 reflects zoning for all private land in Pima County located within the critical habitat designation, including already developed land and *as yet undeveloped* land. Examining zoning for Unit 3 and 4 *undeveloped* private land in Pima County reveals an even higher percentage of land zoned for low density development (i.e., about 90 percent — 597 acres out of 670 acres for Unit 3 and 6,006 acres out of 6,748 acres for Unit 4).

In assessing economic impacts, property values should be estimated based on *current* zoning, not on expectations of upzoning, especially when Pima County officials have not indicated that such upzoning will ever occur.²³ Regarding land planned for higher densities by developers, Pima County officials have stated, "there is no guarantee that all the land planned for higher density development will be rezoned for it," as well as stating that "rezoning is a privilege not a right."²⁴ Indeed, Pima County placed a freeze on "upzoning" to higher density development for some areas in October 1998.

²³ Maveen Behan, Pima County Administrator's Office, personal communication, April 1, 1999.

²⁴ Comments of Sharon Bronson, Board of Supervisors Chairwoman, and Chuck Huckelberry, Pima County Administrator, as cited in "Owl plan will cost Tucson area \$8.5 billion, home builders say," *The Arizona Daily Star*, March 10, 1999.

This freeze was imposed two months *before* the proposal of critical habitat for the pygmy-owl. If the baseline assumption of the Pollack study were changed to reflect low density zoning realities in Pima County, most of the economic impacts suggested by the study for Pima County would be negated.

Exhibit 4-9					
Lower Density Zoning vs. Higher Density Zoning in Critical Habitat Units Located in Pima County					
Unit	Low density -- Acres zoned for one unit per 4.16 acres	Low density -- Acres zoned for one unit per 3.3 acres	Total acres zoned for low density development	Acres zoned for density higher than one unit per 3.3 acres	Percentage of acres zoned for low density development
1	26,811	0	26,811	3	99.9%
2	197	0	197	0	100%
3	352	591	943	217	81.2%
4	2,646	5,848	8,494	2,579	76.7%
6	3,533	0	3,533	0	100%
Total	33,540	6,439	39,979	2799	93.4%
Source: Maveen Behan, Pima County Administrator's Office, personal communication, April 1, 1999.					

2. *The analysis of lost tax revenues should estimate net tax revenue losses rather than gross tax revenue losses.*

The Pollack study fails to consider the additional costs to Pima County and the Town of Marana associated with providing greater services for higher density development. These include the costs of building and maintaining roads, schools, parks, and other infrastructure and providing services such as law enforcement and health care. Although no study has been conducted for Pima County and the Town of Marana to assess how revenue and expenses would change with changes in the density of development, it should be recognized that in many cases high density development can result in expenses to provide additional services that are higher than the revenue generated by a larger tax base. In any case, the Pollack study should estimate *net* gains or losses in tax revenue.

3. *Estimates of lost jobs and foregone economic activity fail to consider that development and construction activity would shift to alternative sites for development. Therefore, the impact on employment and economic activity in the region may be minimal.*

Development that does not take place in areas affected by listing restrictions may be undertaken on other lands available for development. Such substitute areas for development appear to be plentiful in the Tucson metropolitan area. According to Pima County Administrator Chuck

Huckelberry, Pima County recently identified well over 100 square miles of non-environmentally sensitive vacant, developable land in Tucson, Marana, and unincorporated Pima County.²⁵ In the event that future development does not proceed in some areas due to listing restrictions, it can be expected that the economic activity and jobs associated with construction that would have occurred in those areas will shift to development activity in non-environmentally sensitive areas. While developers and other parties owning land within areas affected by listing restrictions may be worse off due to the curtailing of their planned construction, it is unlikely that the regional economy of Pima County and the Town of Marana would be significantly affected, and it is a gross misestimate to suggest that losses would total \$8.5 billion, or that thousands of jobs would be lost from the region.

Mining Activity

Two mining companies, BHP Copper and ASARCO, are concerned about how the proposed designation of critical habitat may affect mining activities.²⁶ BHP Copper operates copper mines and has various real estate property interests throughout Arizona that may be affected by the proposed critical habitat designation. BHP Copper was unable to assess precisely how much of their land (or land they maintain an interest in) lies within the proposed critical habitat designation, but rough estimates suggests about 13,900 acres. Although BHP did not specify specific impacts from critical habitat designation, it remains concerned about how future operations and land uses may be affected.

ASARCO's major concern is that the proposed critical habitat designation of Unit 6 along the San Pedro and Gila Rivers includes a major industrial complex known as the ASARCO Ray Complex, which employed approximately 1,498 people from 1996 through 1998.²⁷ The Ray Complex includes two geographically separate operations:

- Ray Operations, which consists of the Ray Mine, the Ray Solvent Extraction/Electrowinning Plant, and the Ray Concentrator, as well as large areas in which mine materials are deposited.
- Hayden Operations, which consists of the Hayden Smelter, Hayden Concentrator, and about 1,900 acres of tailing ponds.

²⁵ Comment of Chuck Huckelberry, as cited in "Owl plan will cost Tucson area \$8.5 billion, home builders say," *The Arizona Daily Star*, March 10, 1999.

²⁶ Comments on the Proposed Critical Habitat Designation submitted by: (1) Neil A. Gambel, ASARCO, February 24, 1999; and (2) William N. Poorten III, Snell and Wilmer for BHP Copper, March 1, 1999.

²⁷ Neil A. Gambel, ASARCO, February 24, 1999, p. 5.

ASARCO estimates that it owns about 21 percent of the private lands proposed for critical habitat designation in Pinal County, which based on FWS GIS acreage estimates suggests ASARCO owns about 15,000 acres.

ASARCO is specifically concerned that its Ray Mine and Hayden Concentrator operations may have difficulty obtaining future Section 404 permits. In addition, future mine expansions of these operations may require right-of-way permits from the Bureau of Land Management. No specific pending applications for Section 404 permits or right-of-way permits were identified in the public comment letter.

Finally, ASARCO expressed concern that designation of critical habitat may affect its 100 acres of Avra Valley property located in Unit 4. One of ASARCO's subsidiaries (Hydrometrics, Inc.) has recently been awarded a contract to construct a seven mile long levee for the Lower Santa Cruz River Bank Protection Project that will cross Unit 4 and ASARCO's Avra Valley land.

As noted throughout this report, FWS guidance suggests that no additional restrictions on land uses and activities will be imposed above and beyond restrictions that already exist under the ESA listing of the pygmy-owl. This implies that the designation of critical habitat will have no additional economic impacts beyond those that will be experienced as a result of the listing. However, even if restrictions on land use are the same for land within the critical habitat designation as for land outside of the critical habitat designation, the public may perceive or expect the risk of additional restrictions. This perception may result in real reductions in land values and real estate transactions (See text box). Over time, as the public awareness grows that critical habitat will not result in additional restrictions, the impact of designation of critical habitat on property markets can be expected to decrease to the level of impacts associated with listing restrictions.

To explain property market impacts due to public perception of the critical habitat designation, it is necessary to examine three different events associated with the listing and the critical habitat designation for the pygmy-owl: (1) ESA listing; (2) ESA Taking Guidance to clarify listing restrictions and affected areas; and (3) proposal of critical habitat. Exhibit 5-1 illustrates the possible impacts on property markets resulting from each of these events.

- 1. ESA listing** — The initial impact of the pygmy-owl listing on property markets may have been limited because FWS guidance, in the form of a map, on which areas were subject to listing restrictions was unavailable. The public also may not have been fully aware of how listing restrictions would affect land uses and activities. Therefore, it is likely that the potential effects of the listing on property markets were only partially felt at the time of the listing (March 10, 1997).
- 2. ESA Proposed Taking Guidance** — The ESA Proposed Taking Guidance issued in August of 1998 raised public awareness about potential impacts from the listing by providing additional guidance on areas subject to listing restrictions. This clarification may have resulted in impacts to property markets, increasing the listing impacts that were only partially felt at the time

the pygmy-owl was listed. The ESA Proposed Taking Guidance lists the following geographic areas as subject to listing restrictions if they are below 4,000 feet in elevation:

- Cochise County (within San Pedro River floodplain or suitable habitat)
- Gila County (within Gila River floodplain or suitable upland habitat)
- Graham County (within Gila River floodplain or suitable upland habitat)
- Greenlee County (within Gila River floodplain or suitable upland habitat)
- Maricopa County (outside the Phoenix urban area)
- Pima County (outside of the Tucson urban area)
- Pinal County
- Southeastern Yuma County (including the floodplain of Gila on northward and the town of Welton on westward)

3. Proposed Critical Habitat — The proposal of critical habitat may cause two types of effects that have resulted in impacts to property markets:

- **Greater Public Awareness of Areas Subject to Restrictions:** The proposal of critical habitat included the issuance of a map designating eight units of land as potential critical habitat areas. Although all of these units, as well as other areas, were already subject to listing restrictions according to the Taking Guidance, no map was issued with the Taking Guidance. Therefore, the critical habitat designation map likely increased public awareness of areas subject to restrictions, thereby increasing listing impacts that may not have been fully felt at the time of the pygmy-owl listing or the issuance of Taking Guidance.

- **Public Perception that Critical Habitat Designation Will Result in Additional Restrictions:** Public perception that critical habitat designation might involve additional restrictions, above and beyond existing restrictions under the ESA listing, also may have negatively affected property markets. This public perception may have resulted in economic impacts to property markets above and beyond those caused by listing restrictions. Over time, as public awareness grows that critical habitat designation will not result in additional restrictions, the impact of critical habitat designation on property markets can be expected to subside. Those impacts associated with listing restrictions will remain. The economic impacts due to public perception of critical habitat designation are illustrated by the hatched area in Exhibit 5-1. The scale of these effects depends on how great the initial impacts of public perception are on property markets and the length of time it takes for the perceptions to diminish as public awareness grows that designation of critical habitat will not result in additional restrictions.

Illustration of How Public Perception Can Result in Real Economic Impacts

The following story was provided as public comment on the proposed critical habitat designation for the pygmy owl by David T. Cox on February 26, 1999. The story illustrates how public perception that critical habitat designation will result in additional restrictions, above and beyond existing restrictions from the ESA listing, can have real economic impacts. This story has not been confirmed.

"On November 16, 1998, we successfully negotiated and entered into a written contract for sale of the 40 acres to an entity which intended to develop and market finished lots, for a total cash sales price of \$800,000 (\$5,000 per lot) to close February 15, 1999. ...Escrow was opened at Lawyers Title, and \$25,000 deposited by the buyer as earnest money. The buyer retained a 30-day period, through December 17, 1998, to investigate title to the property and feasibility of development of the 40 acres before the sale contract became non-cancelable.

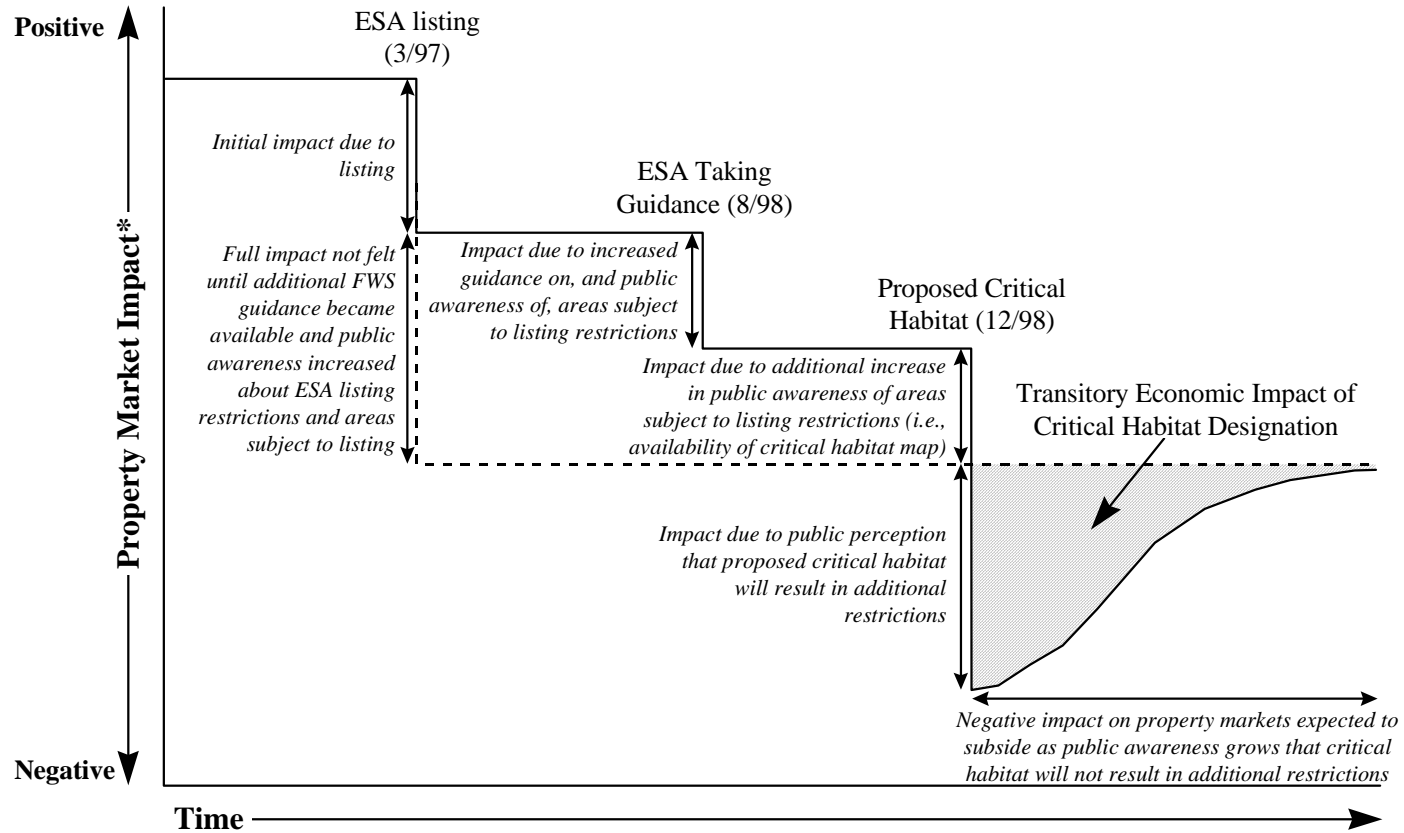
The week of November 23, 1998, the Federal District Court in Tucson ordered the Service to propose critical habitat within 30 days. In response to this 'front page news,' the buyer for the 40 acres requested, and we agreed, to extend its 30-day window to investigate feasibility of development to January 15, 1999, to permit the buyer to review the Service's proposal. The proposed rule was issued December 22, 1998, which would designate the 40 acres as critical habitat. On January 4, 1999, we received notice from the buyer and Escrow Agent informing us that the escrow and contract were canceled. The buyer informed us it canceled because of the proposed pygmy owl critical habitat designation. The buyer has stated it has a continuing interest in acquiring the 40 acres if the impediment to developing the 160 lots, created by the pygmy owl habitat designation, can be quickly eliminated."

Note: Mr. Cox was advised by the FWS that, due to the presence of pygmy owls on or near his property, and the presence of suitable habitat on the property, even without any critical habitat designation, he or his buyer would still likely need to go through ESA compliance procedures to obtain the necessary permits for low-density housing development to proceed on the property. The FWS offered their assistance in obtaining the necessary permits and are still in discussions with Mr. Cox.

Source: David T. Cox, "Comments on Proposed Determination of Critical Habitat for Pygmy Owl," Tortolita Property Investors, February 26, 1999.

Exhibit 5-1

IMPACTS OF CRITICAL HABITAT DUE TO PUBLIC PERCEPTION OF ADDITIONAL RESTRICTIONS



* Indicates *direction* of property market impacts (positive or negative), rather than magnitude/size of impacts.

This section identifies the potential impacts to small entities and communities located within the proposed critical habitat designation. Potentially affected small entities and communities include: (1) Indian Allotments in Unit 6; (2) towns dependent on a large single employer (i.e., ASARCO) that may be affected; (3) bond security for district that has recently invested in infrastructure; and (4) small businesses located in the critical habitat designation. These small entities and communities are described in more detail below. However, as noted previously, FWS guidance suggests that designation of critical habitat will not impose additional restrictions above and beyond the restrictions that already exist under the ESA listing. Therefore, no impacts from the designation of critical habitat are expected for these small entities and communities.

Indian Allotments

The proposed critical habitat designation includes 219 acres of land identified as Indian Allotments. The parcels are located within Unit 6, between Hayden and Dudleyville, along the San Pedro River. Staff at the Department of the Interior, Bureau of Indian Affairs (BIA) report that these lands are classified as Public Domain Allotments and are held in trust by the BIA for Native Americans.²⁸ According to BIA, the designated Indian Allotments were given to members of Native American tribes decades ago and have since been passed down through family heirs. The allotments in Unit 6 are currently held by descendants of the San Carlos Apache Tribe.²⁹ No one currently

²⁸ Diana Halbert, San Carlos Agency, Bureau of Indian Affairs, personal communication, March 15, 1999.

²⁹ Mike Smith, San Carlos Agency, Bureau of Indian Affairs, personal communication, March 16, 1999.

resides on the allotments; the lands are primarily used for hunting, fishing, gathering of firewood in mesquite bosques, and other traditional gathering activities.³⁰ There are no proposals for further activity on the allotments identified by BIA.

Towns Dependent on ASARCO

In ASARCO's comment on the proposal of critical habitat, the company notes that "the employees and their families at the ASARCO Ray Complex make up the majority of the population of the Towns of Kearny, Hayden, and Winkelman."³¹ ASARCO suggests that if its economic activities are affected by the critical habitat designation, it will likely impact these communities as well.

ASARCO's major concern is that the proposed critical habitat designation of Unit 6 along the San Pedro and Gila Rivers includes the ASARCO Ray Complex. Specifically, ASARCO is concerned that its Ray Mine and Hayden Concentrator operations may have difficulty obtaining future Section 404 permits. In addition, future mine expansions of these operations may require right-of-way permits from the Bureau of Land Management. No specific pending applications for Section 404 permits or right-of-way permits were identified in ASARCO's comments.

Impacts on Bond Security

In comments on the proposed critical habitat designation, Red Hawk Canyon Community Facilities Districts expresses concern that critical habitat designation may delay or restrict development, which in turn may reduce land value and the security of bonds. The district has recently issued over \$25 million in tax exempt bonds to construct public infrastructure. Most of the infrastructure is complete, but the bonds are outstanding.

Small Businesses

Data were not available to identify the number of small businesses operating in each proposed critical habitat unit. However, according to FWS guidance, these businesses will not face any additional restrictions from the designation of critical habitat above and beyond those restrictions that already exist under the ESA listing.

³⁰ Pierre Cantou, Phoenix Regional Office, Bureau of Indian Affairs, personal communication, March 17, 1999.

³¹ Neil A. Gambel, ASARCO, Comment on the Proposed Critical Habitat Designation, February 24, 1999.

The following Geographic Information System (GIS) maps were provided by FWS staff. They show each of the eight units proposed for critical habitat designation for the pygmy-owl. The maps are coded according to land ownership/management by square mile parcel. A table of estimated acreage by ownership/management is also provided.

R 10 E

T 17 S

T 18 S

- Private
- ▨ State Trust
- ▧ BLM
- ▩ BANWR

R 9 E

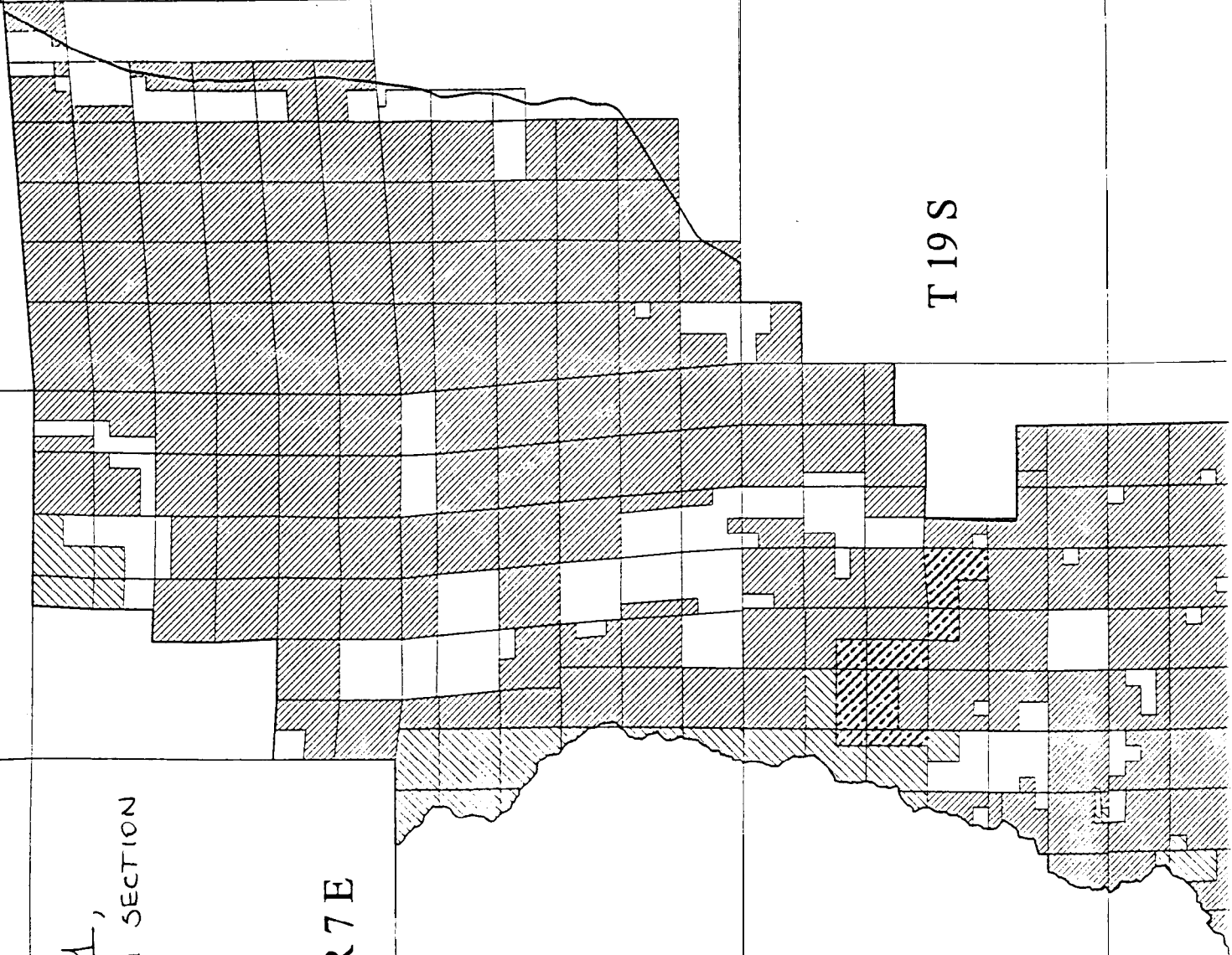
T 19 S

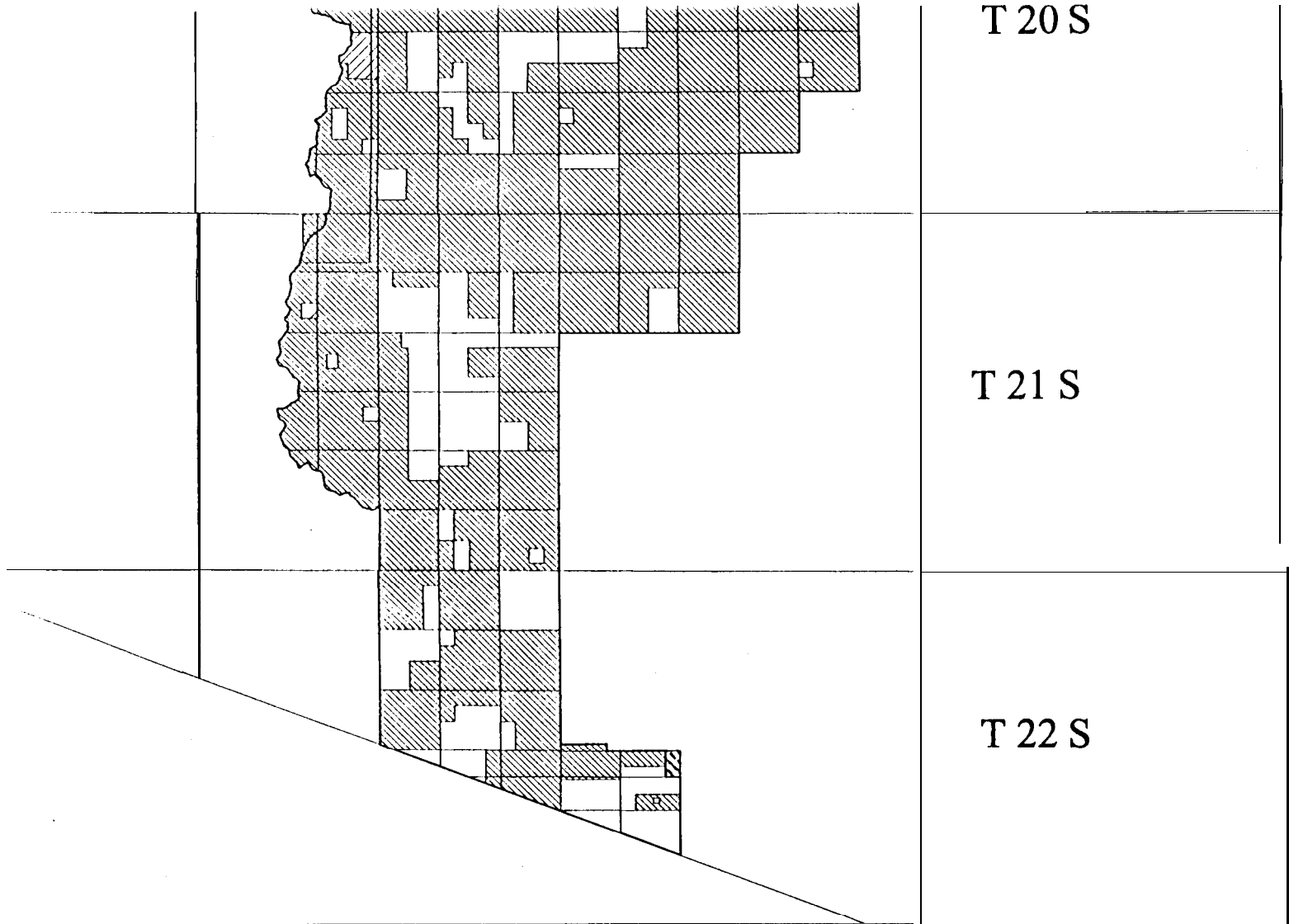
R 8 E

UNIT 1,
NORTHERN SECTION

R 7 E

R 6 E





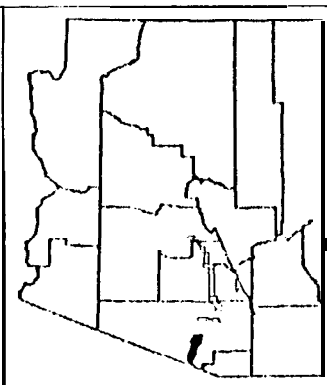
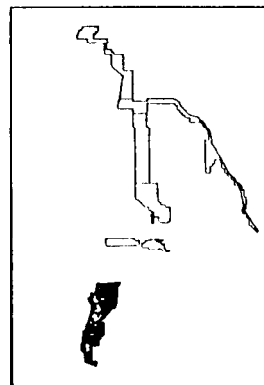
T 20 S

T 21 S

T 22 S

UNIT 1,
SOUTHERN SECTION

Acres	Pima Co.
Private	27776
State	125348
B L M	5894
TOTAL	159018



Cactus Ferruginous Pygmy-owl
Unit 1

Information prepared from BLM
1:100,000 surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12.
Maps not to standard scale.

Produced by USFWS
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Technical Services
Division - GIS

Date prepared: 03/09/99
Date prepared: 03/09/99
Prepared by: RR

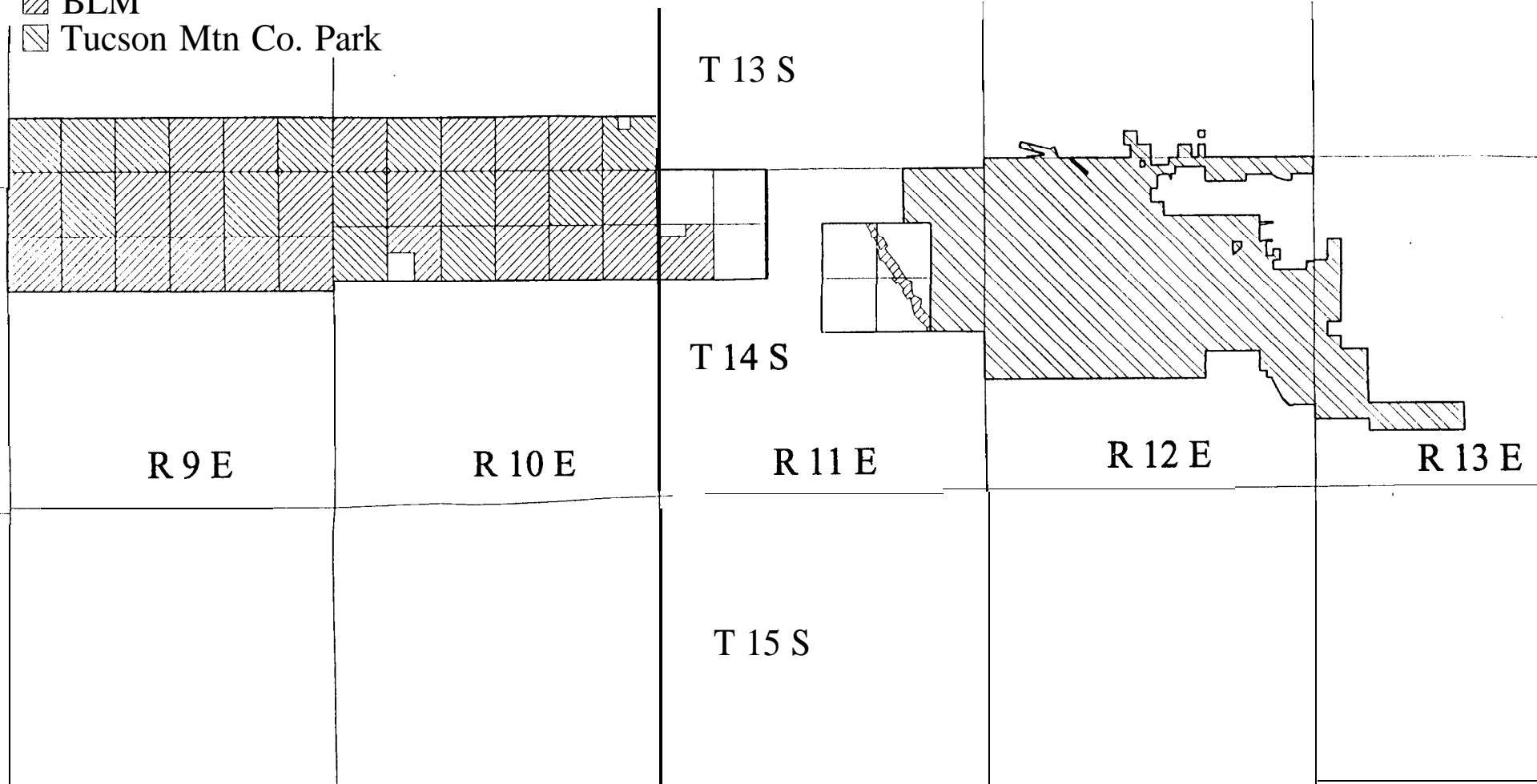


Cl Private

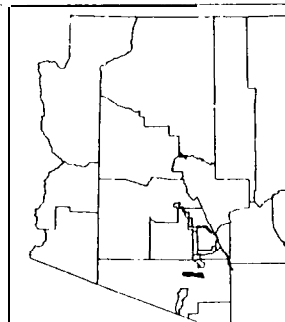
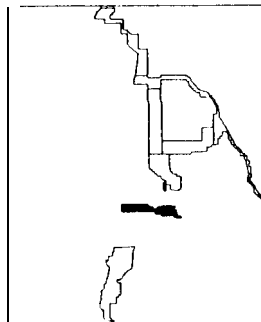
State Trust

BLM

Tucson Mtn Co. Park



Acres	Pima Co.
Private	4542
State	8547
BLM	15880
TMCP	18109
TOTAL	47078



Cactus Ferruginous Pygmy-owl Unit 2

Information prepared from BLM 1:100,000 surface management maps.
ALRIS data used for land status (except for Tucson Mtn Co. Park).
NAD 27 UTM Meters Zone 12.
Maps not to standard scale.

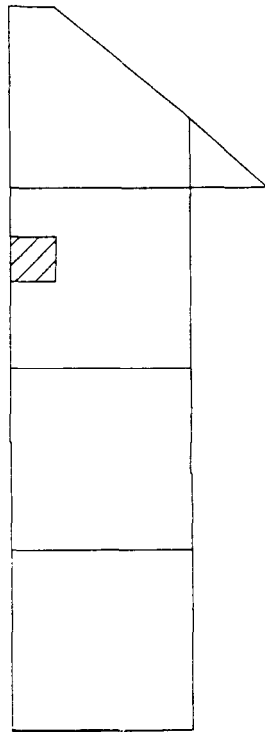
Produced by USFWS
Southwest Region
Technical Services
Division - GIS.

Date prepared: 03/08/99
Date prepared: 03/08/99
Prepared by: RR



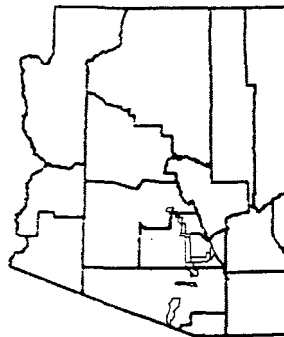
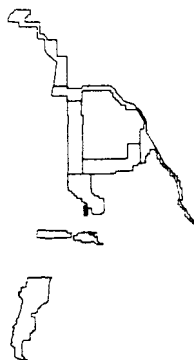
Acres	Pima Co.
Private	2420
DoD	40
TOTAL	2460

R 12 E



Private
 Military Reservation

T 12 S



**Cactus Ferruginous Pygmy-owl
Unit 3**

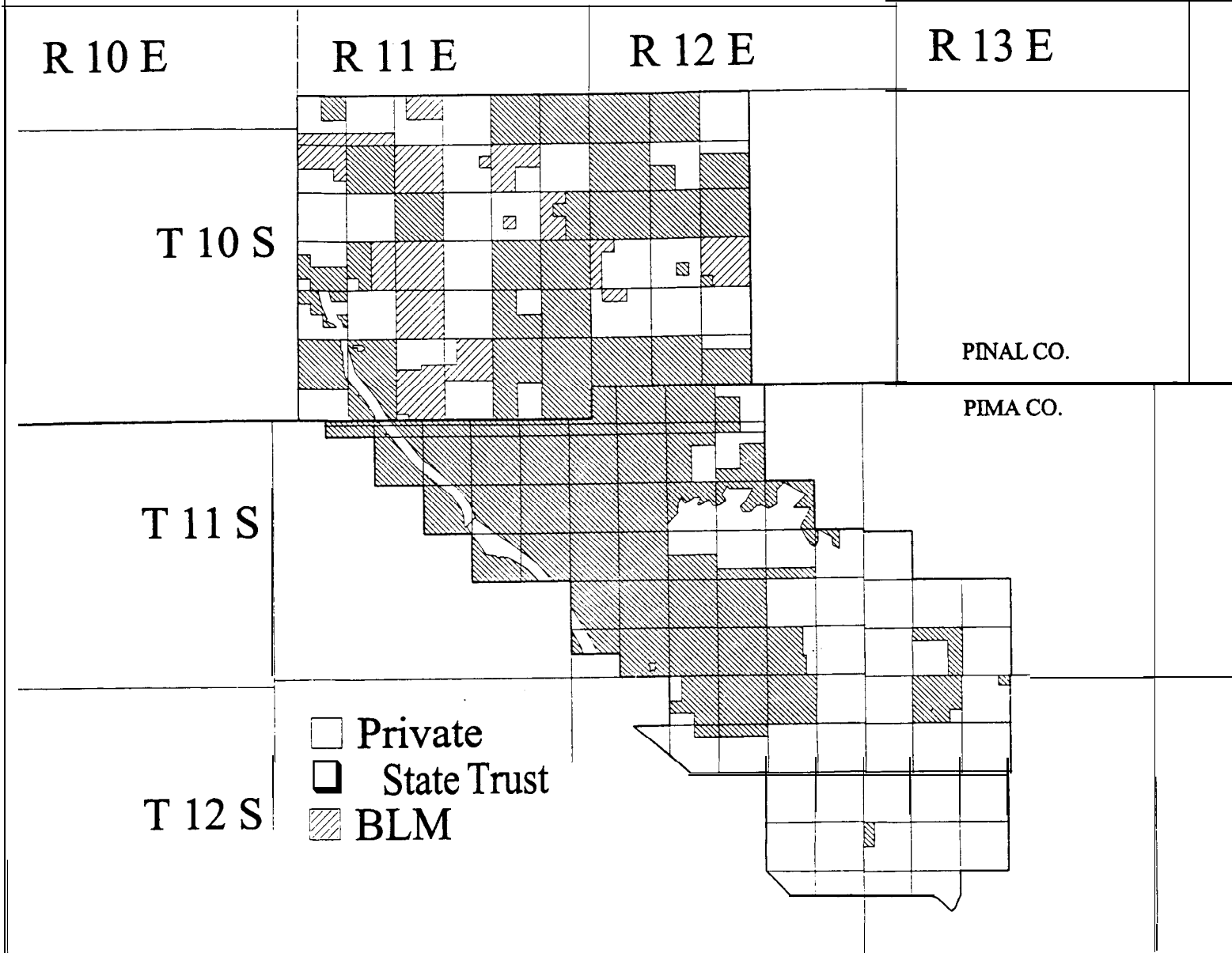
Information prepared from BLM 1:100,000
surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12.
Maps not to standard scale

Produced by USFWS
Southwest Region
Technical Services
Division - GIS

Date prepared: 03/08/99
Date modified: 03/08/99
Prepared by: RR



Acres	Pima Co.	Pinal Co.	TOTAL
Private	24780	15518	40298
State	22080	16537	38617
BLM		5968	5968
TOTAL	46860	38023	84883



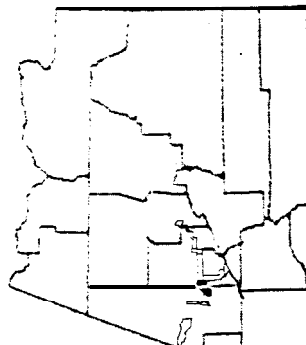
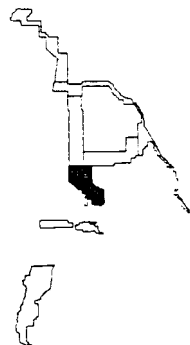
- Private
- State Trust
- BLM

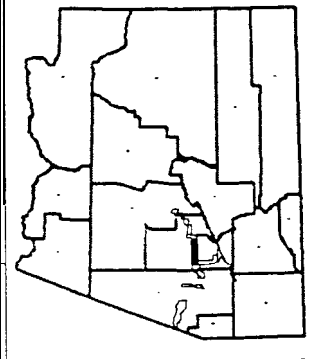
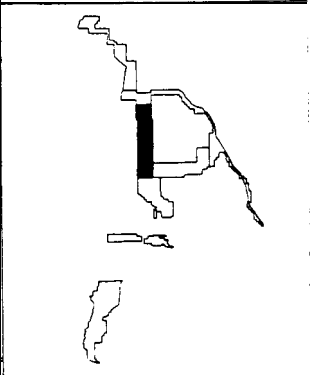
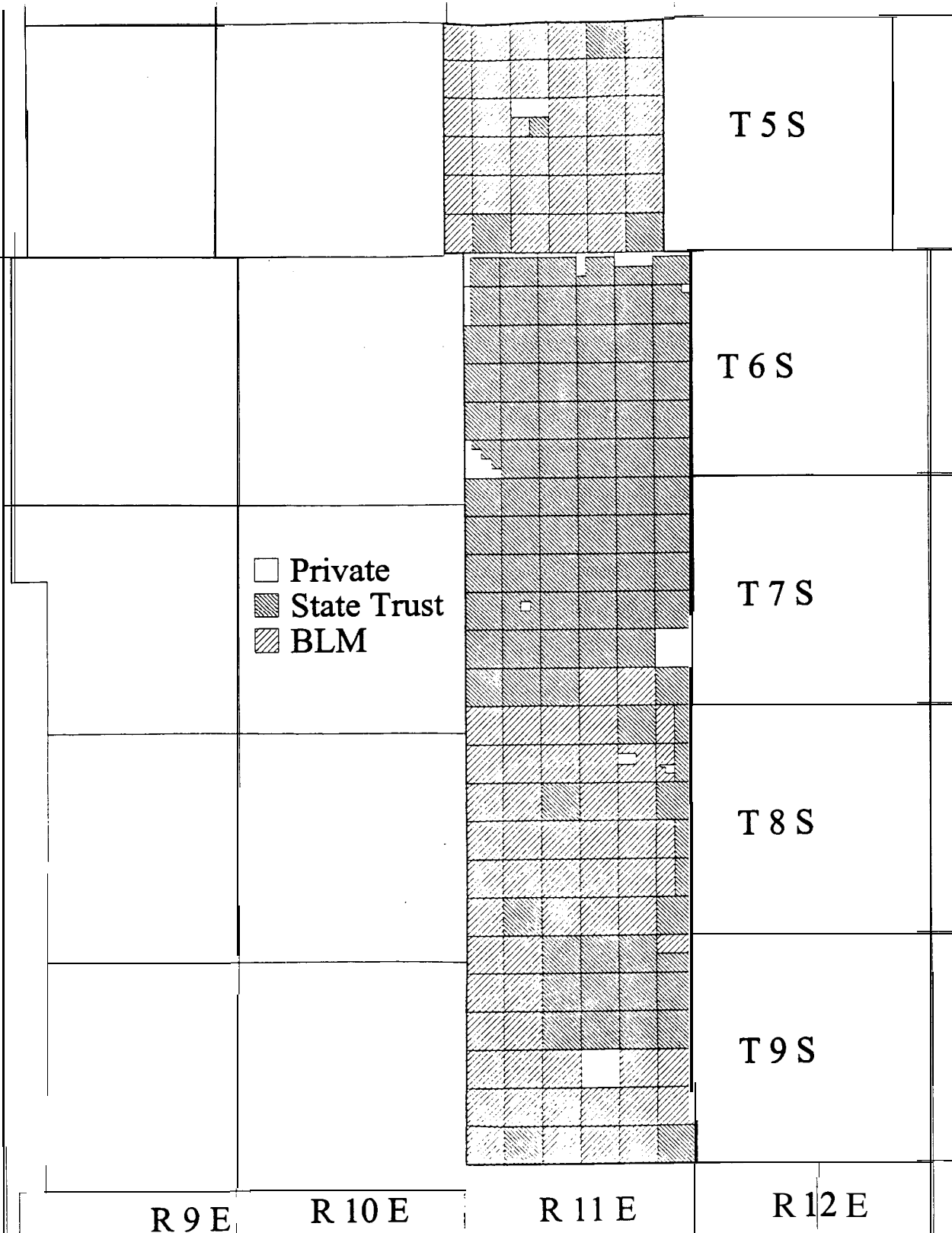
**Cactus Ferruginous Pygmy-owl
Unit 4**

Information prepared from BLM 1:100,000 surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12.
Maps not to standard scale

Produced by USFWS
Southwest Region
Technical Services
Division - GIS

Date prepared: 03/08/99
Date prepared: 03/08/99
Prepared by: RR





Acres	Pinal Co.
Private	3064
State	57141
BLM	52643
TOTAL	112848

Cactus Ferruginous Pygmy-owl
Unit 5a

Information prepared from BLM 1:100,000 surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12
Maps not to standard scale.

Produced by USFWS
Southwest Region
Technical Services
Division - GIS

Date prepared: 03/08/99
Date prepared: 03/08/99
Prepared by: RR



T 11 E

T 12 E

T 13 E

T 14 E

T 15 E

T 16 E

Private
 State Trust

R 7 S

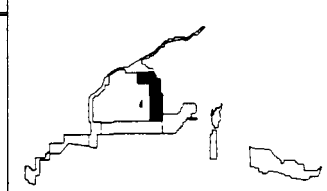
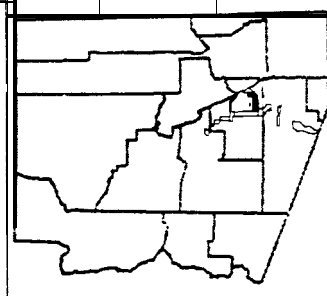
R 8 S

R 9 S

R 10 S

Acres
 Private 6730
 State 91542
 TOTAL 98272

Pinal Co.
 6730
 91542
 98272



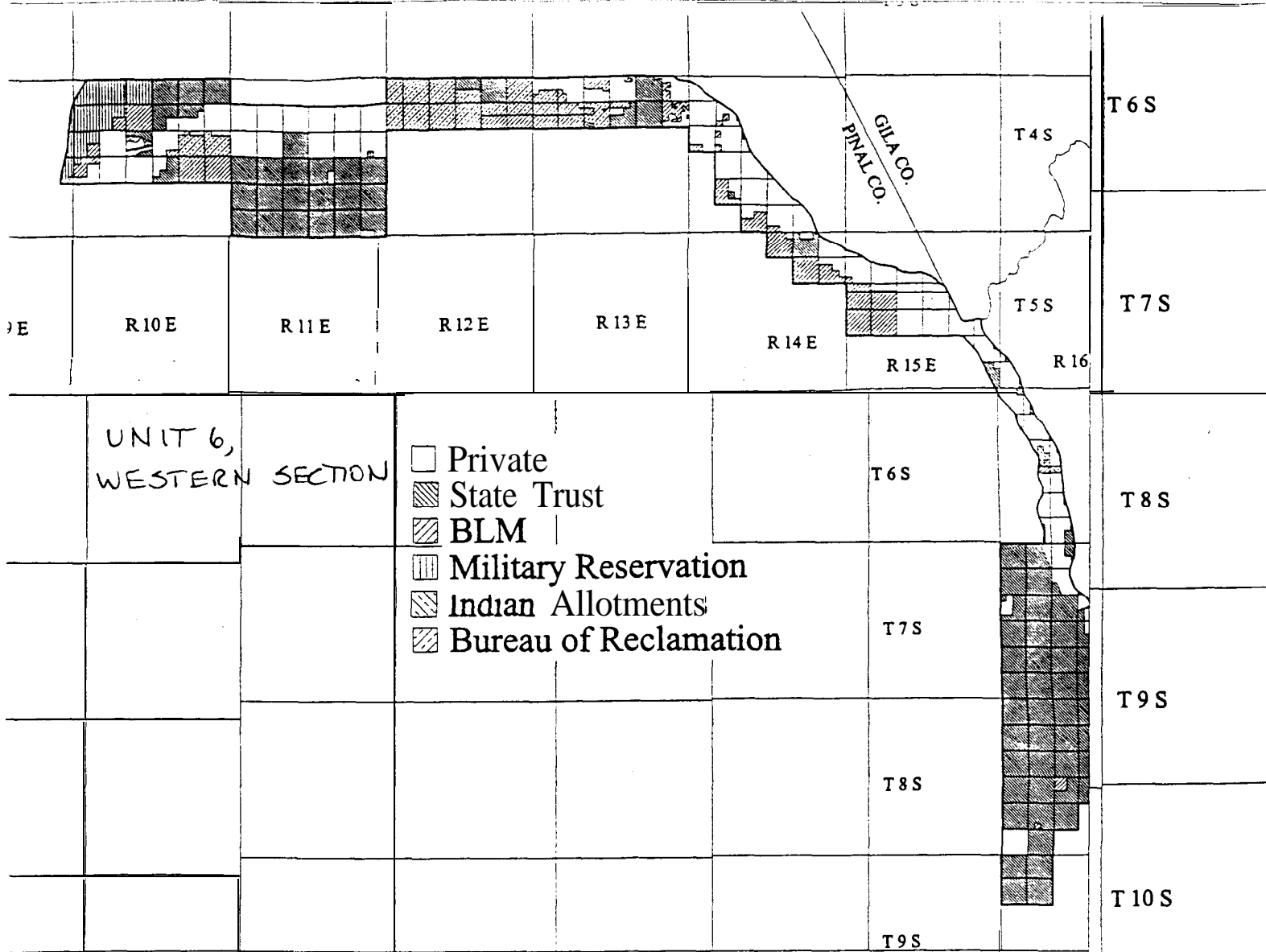
Cactus Ferruginous Pygmy-owl
 Unit 5b

Information prepared from BLM 1:100,000 surface management maps.
 ALRIS data used for land status.
 NAD 27 UTM Meters Zone 12
 Maps not to standard scale

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Date prepared: 03/08/99
 Date modified: 03/08/99
 Prepared by: RR



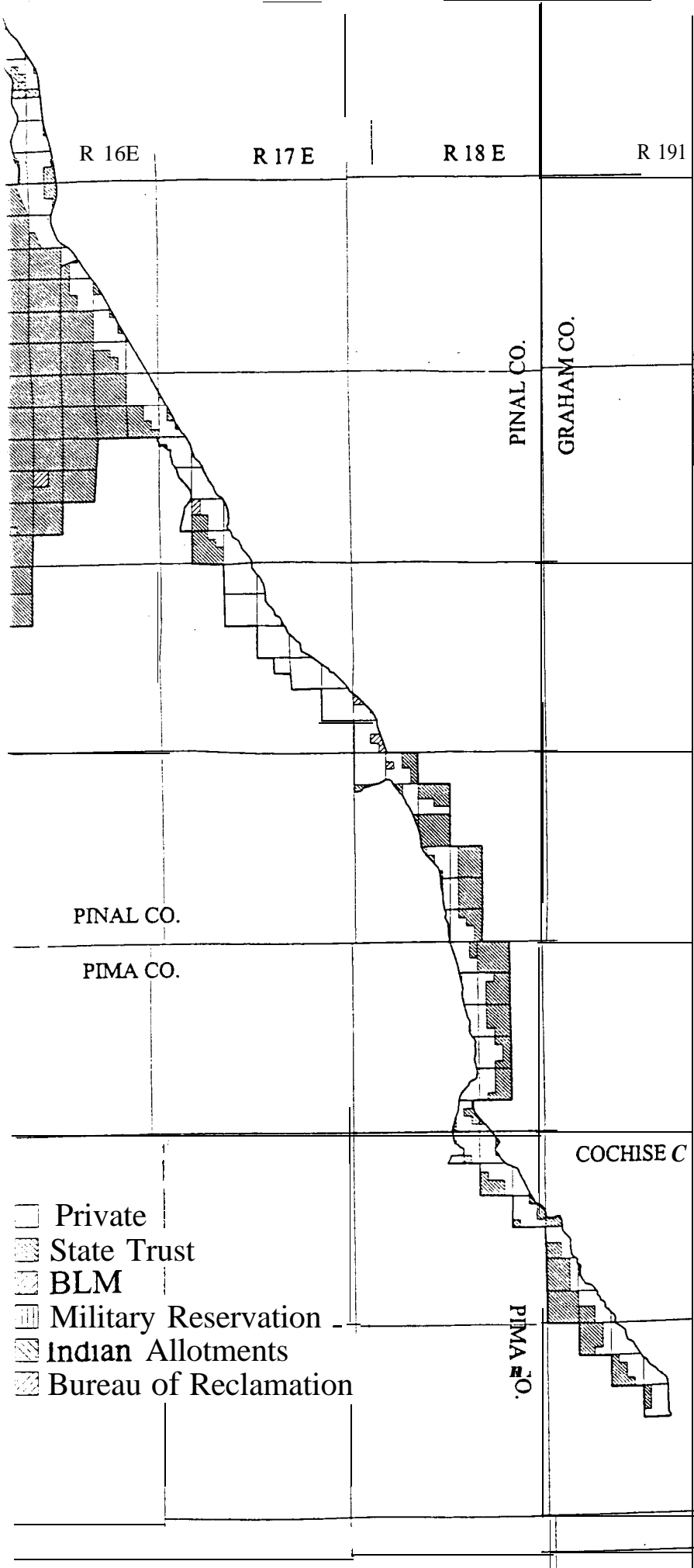


Acres	Cochise Co.	Pima Co.	Pinal Co.	TOTAL
Private	2463	4763	44457	51683
State	2381	2784	50881	56046
BLM		2	10218	10220
DoD			3851	3851
Indian			219	219
BREC			8716	8716
TOTAL	4844	7549	118342	130735

T11s

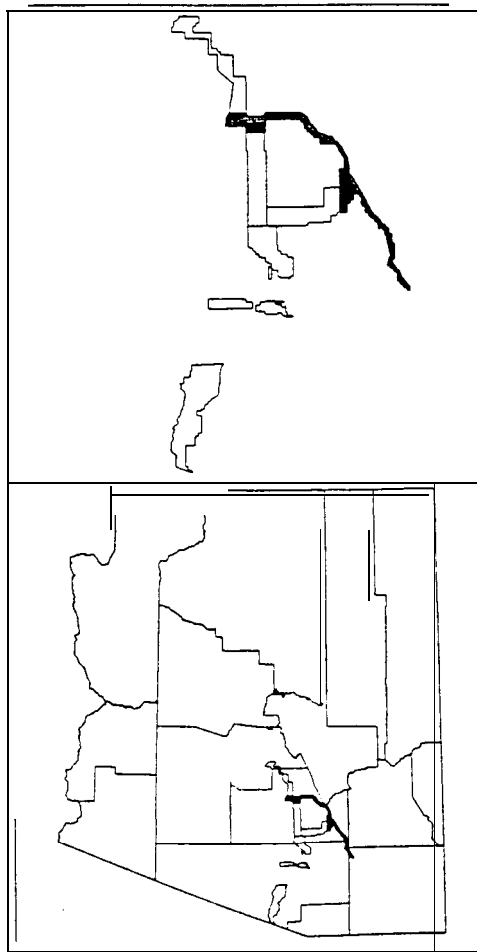
T12s

T13s



UNIT 6,
EASTERN SECTION

- Private
- State Trust
- BLM
- Military Reservation
- Indian Allotments
- Bureau of Reclamation



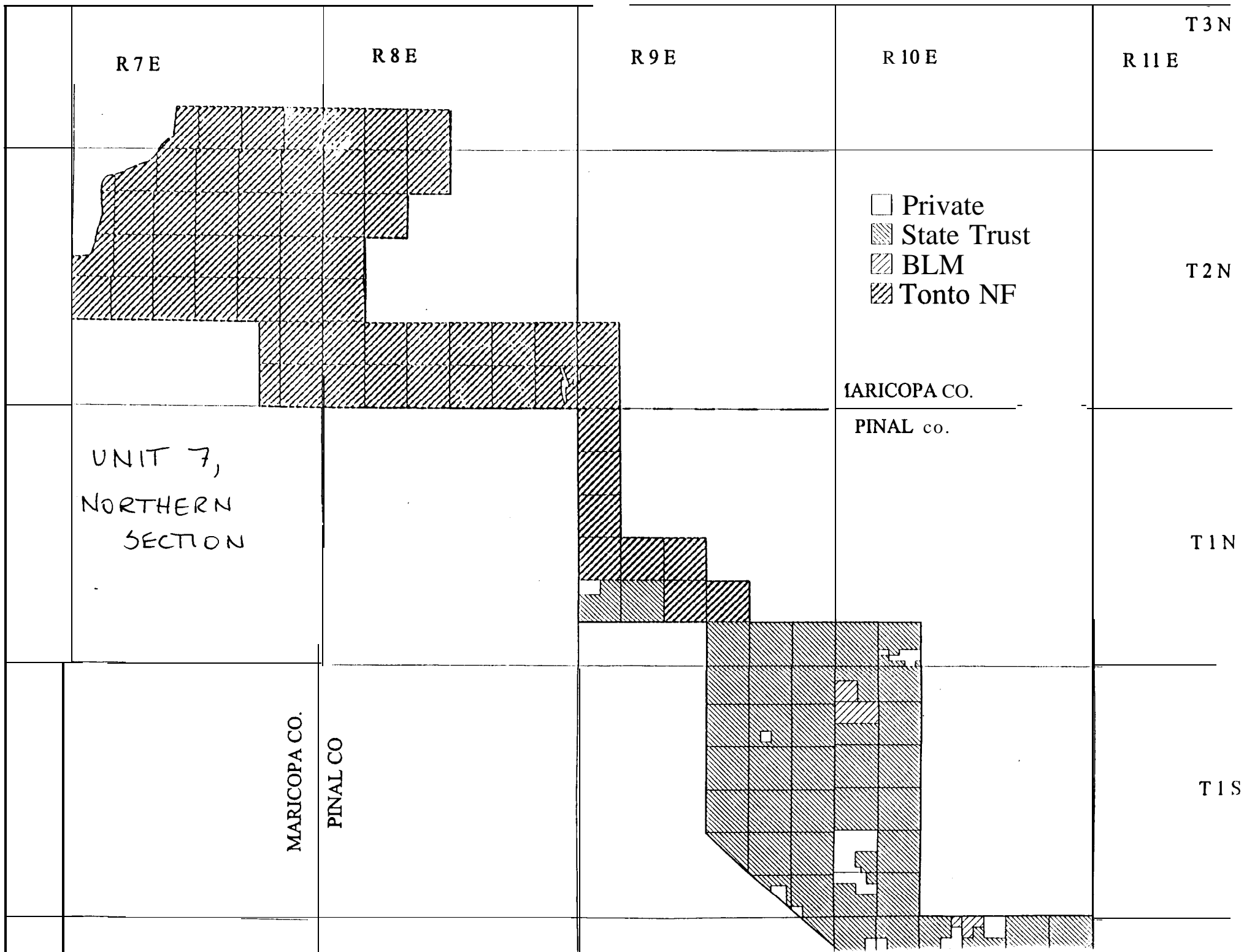
Cactus Ferruginous Pygmy-owl
Unit 6

Information prepared from BLM 1:100,000
surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12
Maps not to standard scale

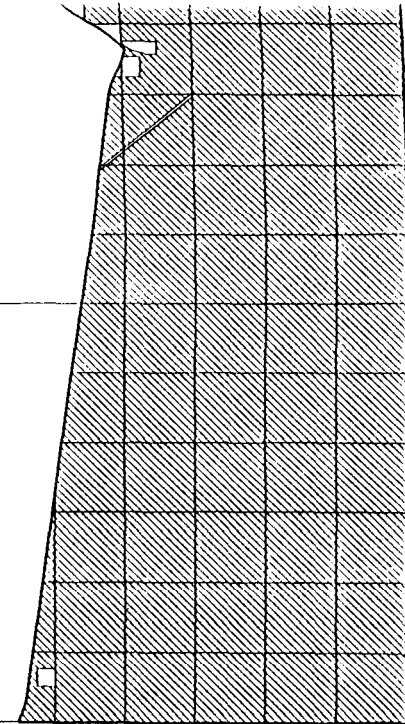


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Prepared by: RR



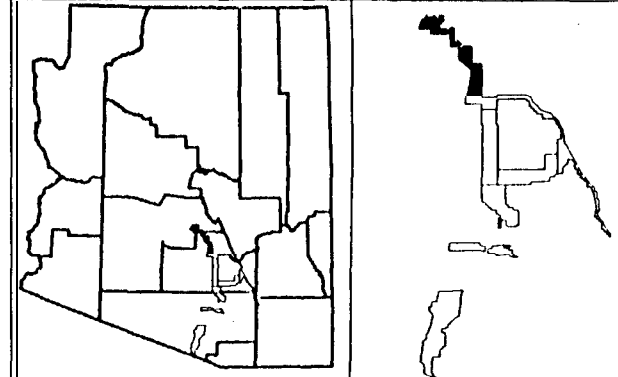
UNIT 7,
SOUTHERN
SECTION



T 2 S

T 3 S

Acres	Maricopa Co.	Pinal Co.	TOTAL
Private	95	1929	2024
State		57410	57410
BLM		678	678
Tonto NF	33316;	5064	38380
TOTAL	33411.	65081	-98492



Cactus Ferruginous Pygmy-owl
Unit 7

Information prepared from BLM
1: 100,000 surface management maps.
ALRIS data used for land status.
NAD 27 UTM Meters Zone 12
Maps depicted not to standard scale.

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Date prepared: 03/04/99
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Prepared by: RR

