



RANCHO SECO ACQUISITION

2004 Conservation Bond Program

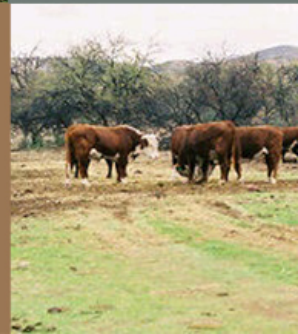


PIMA COUNTY BOARD OF SUPERVISORS

Sharon Bronson, Chair, District 3; Ann Day, District 1
Ramón Valadez, District 2; Raymond J. Carroll, District 4
Richard Elías, District 5

COUNTY ADMINISTRATOR

C.H. Huckelberry





MEMORANDUM

Date: February 3, 2005

To: Conservation Acquisition Commission

From: C.H. Huckelberry
County Administrator

A handwritten signature in dark ink, appearing to read "CHH", is written over the printed name "C.H. Huckelberry".

Re: **Rancho Seco**

Attached is a report on the County's proposed acquisition of the Rancho Seco property. At your February 10, 2005 meeting, I plan to recommend that you, the Conservation Acquisition Commission, recommend that the Board of Supervisors acquire the Rancho Seco property by accepting the Option to Purchase Agreement entered into on January 14, 2005 between the Arizona Open Land Trust and the sellers, Hooker and Associates Limited Partnership.

By accepting the Option to Purchase Agreement, Pima County would be acquiring 9,574 acres outright, as well as a conservation easement over the remaining 478 acres known as the seller estates. The conservation easement would limit the seller estates to a total of 10 lots around the two ranch headquarters. Pima County would get the first right of refusal on the sale of the seller estates. The acquisition includes the transfer of water rights as well, the details of which are still being negotiated. The sellers will manage the property for Pima County according to a management agreement which is currently being developed, and a resource management plan that will be updated regularly to reflect the state of the resource values on the property.

The appraisal has been completed and reviewed by County staff and I feel that the purchase price of \$18.5 million is reasonable based on the terms of the Option. Due to the limited time frame we have to complete due diligence on this acquisition, this report is being provided to you while the remaining due diligence is taking place. Any additional information we have available by your February 10 meeting will be provided to you at the meeting, and thereafter. This may include results of the environmental assessment, the conservation easement document for the seller estates, the first right of refusal document for the seller estates and the State and BLM grazing leases, and the management agreement.

After years of working to reach an agreement on the acquisition of Rancho Seco, I am very pleased to be able to present this Option to you. Rancho Seco is a large and biologically valuable property in Altar Valley that needs to remain unfragmented, and is a very important addition to the reserve system.

CHH/jj
Attachments

c: The Honorable Chair and Members, Pima County Board of Supervisors
John Bernal, Deputy County Administrator, Public Works
Maeveen Behan, Assistant County Administrator for Policy- Land, Water, Environment
Christina Biggs, Real Property Services Manager
Christine Curtis, Sr. Real Property Acquisition Agent, Real Property Services
Nicole Fyffe, Executive Assistant to the County Administrator

Rancho Seco and Pima County's 2004 Conservation Bond Program

Background

Pima County and the Arizona Open Land Trust have been working to conserve the Rancho Seco property for four years. The Ranch is located north of Arivaca, adjoining the Buenos Aires National Wildlife Refuge and is made up of two ranches, the Rancho Seco and the Santa Lucia Ranch, herein both referred to as Rancho Seco (see location map Attachment 1). Rancho Seco includes over 10,000 acres of private land and over 30,000 acres of State and BLM grazing leases. Conservation of this ranch will preserve a very large, unfragmented landscape within Altar Valley, containing high biological values, habitat for numerous Priority Vulnerable Species, and cultural and historic resources.

All of the private lands of Rancho Seco are included in the 2004 Bond Ordinance as high and secondary priority private Habitat Protection Priorities. 3,843 acres of State Trust lands, part of the Rancho Seco state grazing lease lands, are included as secondary priority state Habitat Protection Priorities (see Conservation Lands System/Habitat Protection Priorities map, Attachment 2).

The Arizona Open Land Trust entered into an Option to Purchase Agreement with the seller, Hooker Associates Limited Partnership, dated January 14, 2005, for \$18.5 million (Attachment 4). Pending approval by the Conservation Acquisition Commission and the Pima County Board of Supervisors, Pima County will accept assignment of this Option. The Option includes acquisition of 9,574 acres of private land and a conservation easement over 478 acres around both ranch headquarters, referred to as the seller estates. The conservation easement will limit the number of lots on the seller estates to a total of 10. Pima County will have first right of refusal on the seller estates, as well as first right of refusal on the State and BLM grazing leases. The acquisition includes the transfer of water rights as well.

The Rowley family/Hooker Association Limited Partnership, will manage and maintain the property for Pima County for a minimum of 10 years. The Option agreement is contingent upon the County and the sellers executing a management agreement. The management agreement will lay out the terms of the contract between Pima County and the Manager of the property, including management objectives in accordance with conservation ranching principles. The management agreement will also state that the County and the Manager will develop a resource management plan over a set period of time, to be updated regularly based on changing conditions of the lands and what actions are or are not working to conserve the natural habitat for which the property is being acquired.

Biological Resources

A biological assessment of the Rancho Seco property was conducted by EPG on January

2005 (Attachment 7, includes many photographs of the property). Below is a summary of the assessment.

The Rancho Seco property presents a good example of semidesert grassland and open mesquite woodland. Topography in the area is varied with areas of flat to gently rolling hills giving way to rugged topography of the Cerro Colorado and Las Guijas Mountains. Geologic composition is primarily volcanic with some fairly extensive limestone features present in the mountain ranges. Drainage is generally to the northwest in the western half of the property and to the east-southeast in the eastern half. The uplands are dominated by low- to mid-sized velvet mesquite with groundcover consisting mostly of small shrubs, grasses and a few cacti. Mesquite woodlands dominate the larger ephemeral washes, which also support canyon hackberry and a few cottonwoods, velvet ash and seepwillow. The latter three species are wetland indicators, suggesting areas of shallow groundwater where they are present.

The majority of the Ranch Seco property is classified within the Sonoran Desert Conservation Plan (SDCP) as Multiple Use or Recovery Management Areas. The property contains some Biological Core along Sopori Wash and on the western boundary where it abuts the Buenos Aires National Wildlife Refuge. Sopori Wash and the Las Guijas/Calera Wash complex are considered Important Riparian Areas. Human activities in the area have predominantly been cattle ranching, which still exists today, and mineral mining.

Reconnaissance surveys have produced direct evidence for sixteen species of wildlife present in the area. A total of 143 wildlife species are determined to potentially occur on the property, and they include 41 mammals, 77 birds, 5 amphibians and 20 reptiles. There are nine SDCP Priority Vulnerable Species that have a moderate to very high potential of being present at Rancho Seco, of which one, rufous-winged sparrow, was detected during surveys in September 2002. Other species with moderate to high probability of occurring here are California leaf-nosed bat, Mexican long-tongued bat, lesser long-nosed bat (only as a spring or fall transient) Pale Townsend's big-eared bat, Merriam's mouse, Bell's vireo, Swainson's hawk and Chiricahua leopard frog. In addition, there are three special elements that occur on the property: Mesquite Riparian, Mixed Grass-scrub, and Interior Southwestern Riparian Deciduous Forest.

Evaluation of acquisition for credit for Pima County's incidental take permit under Section 10(a)(1)(B) of the Endangered Species Act

The private lands of Rancho Seco contain 1,502 acres of Biological Core, 978 acres of Important Riparian, and 7,739 acres of Multiple Use, as identified in the County's Conservation Lands System. All of the private lands of Ranch Seco fall within the high and secondary priority private Habitat Protection Priorities. Conservation of the property will assist in building the biological reserve outlined in the County's Draft Multi-Species Habitat Conservation Plan, and preserve habitat for at least nine SDCP Priority Vulnerable Species.

Cultural and Historic Resources

Research conducted for the Sonoran Desert Conservation Plan indicates that very few formal surveys have been conducted to record cultural resources in the upper Sopori Wash and upper Arivaca Creek areas. Large scale surveys conducted in the 1980s to the north of Rancho Seco found evidence of human occupation for many thousands of years. However, the general lack of survey coverage for the valley is particularly acute to the east of the Buenos Aires National Wildlife Refuge. Nonetheless, cultural resources of both historic and prehistoric origin are known within Rancho Seco.

A total of 14 archaeological and historic sites are known on the property, and all but two are concentrated along Arivaca road and in the Cerro Colorado Mountains. In the mountains, rock shelters are described, some bearing pottery indicating that formative cultures such as the Hohokam people used them in prehistory, possibly as hunting camps. One of these sites is described as a "fortified ridge," which suggests defensive uses. Along what is today Arivaca road are a collection of small, prehistoric limited activity sites, probably used for gathering plant resources. These date to between A.D. 1200 and A.D. 1450. In addition, two small villages occupied by the Hohokam Indians between A.D. 900 and A.D. 1200 are also recorded. These sites were undoubtedly established because of the presence of water and arable land along Sopori Creek and its secondary drainages.

Because of the lack of survey information, the experts convened for the Sonoran Desert Conservation Plan estimated the archaeological sensitivity of the landscape to roughly predict site occurrence. Upland areas within Rancho Seco are characterized as low archaeological sensitivity, meaning that expert opinion expects there to be low numbers of sites in the area. The exceptions are along Las Guijas Wash on the west end of the property, which is believed to have a high archaeological sensitivity; and along Sopori Creek, which is also believed to contain high numbers of archaeological sites. In short, the known evidence, plus estimates on archaeological site occurrence, suggests that in prehistoric times the area was generally utilized to a low degree, with some exception where surface water was available.

Historically, the ranch property was used for ranching and mining. Review of the Government Land Office maps recorded between 1888 and 1910 indicate a number of homesteads and mining operations were established, along with the roads connecting them all to regional transportation network. Many roads are shown; however, the one named road on the ranch property is the "Arivaca Stage Road" (GLO Map 1910 T21S, 10E, S3 and 10), vestiges of which may still survive.

Three homesteads are shown on the maps: the Martinez House (GLO Map 1888, T20S, R9E, S24), the Robledo House (GLO Map 1888, T20S, R10E, S30) and the Moreno House (GLO Map 1888, T20S, R10E, S17). Mines include the "Liberty Mine" (GLO Map 1888 T20S, R10E, S16), the "Plomo No.2 Mine" (GLO 1909 20S, 11E, S18) and the "Pesqueria Mining Camp" (GLO Map 1910 T21S, R10E, S5). Several mining shafts are also shown one of which is named as the "Mines del Toyo" (GLO Map 1909 T20S, 10E, S36).

The most notable mining operation shown within the ranch property boundary, and the only one that is also recorded as an archaeological site, is the Cerro Colorado/ Heintzelman Mine shown on the 1888 GLO map in T20S, 10E, Section 25. Today, the ghost town of Cerro Colorado is often noted in Pima County as an important symbol of Pima County's 19th century frontier past.

It is reported that mining in the Arivaca vicinity began during the Spanish Colonial and Mexican periods between roughly 1790-1820; however, it was not until after the Apache threat was at least somewhat diminished during the American Territorial period that substantial mining efforts were undertaken. Following the Gadsden Purchase of 1854, the Sonora Exploring and Mining Company set up operations in Tubac and began work on the silver mines in the Cerro Colorado mining district.

The Cerro Colorado mine opened in 1858 later became known as the Heintzelman Mine named for Samuel P. Heintzelman, the first company president. A village was established at the entrance to the mine that included a walled fortification and various buildings and storehouses. In 1861, with the mine subject to continued Apache attacks and plagued by continuous stealing and desertion by the Mexican and Indian workers, John Poston, co-owner of the mine, executed one of the workers caught stealing to set an example. Rather than intimidating his workers, they rose in rebellion, murdered John Poston, and destroyed the mine workings looking for a fortune in stolen silver bullion that was reported buried near the mine. Mining resumed after the Civil War, and nearby Arivaca became a ranching and mining boomtown. Ruins of the Cerro Colorado mining district settlement and Poston's gravesite remain within Ranch Seco.

To summarize, Rancho Seco has not been surveyed for cultural resources in any systematic way with only a few small exceptions; however, archaeological resources are known to exist on the property in a number of locations indicating prehistoric use of the land between A.D. 900 and A.D. 1450. Experts believe that the upland areas of the ranch property may have seen low levels of use in prehistoric times except where water was available in springs or washes.

Historic map data suggests the presence of three homesteads/ranches, as well as historic roads including the Arivaca stage route. Vestiges of these may still exist. Mining activities are represented by a number of features including shafts, camps, mines, and the town and mining works of Cerro Colorado, a well-known historical site. It is highly likely that with further survey, additional prehistoric sites will be found on the property with the potential to contribute to understanding adaptations to desert areas outside the major river valleys. Additional evidence of historic land use can also be expected on Rancho Seco, particularly 19th and early 20th century mining operations, an important part of Pima County's history and the history of the western frontier.

While no places of traditional cultural significance to the Tohono O'odham are known to be located on the property, the O'odham view the area as part of its traditional use lands. The town of Arivaca was first the location of the Piman village of "Aribac" or "place of little reeds or springs" that was encountered by Fr. Kino in 1695. Baboquivari Peak, on the west side

of the Altar Valley, is considered a holy place to the O'odham people. In general, rock art sites and prehistoric village sites are considered to be ancestral sites and traditional cultural places by the Piman tribes and by Hopi whose clan migration stories place them in southern Arizona as well.

Attachments

Per the Conservation Acquisition Commission's adopted operating policies, attached are the following items:

- | | |
|---------------|---|
| Attachment 1: | Location Map/Land ownership |
| Attachment 2: | Conservation Lands System/Habitat Protection Priorities Map |
| Attachment 3: | Aerial Map |
| Attachment 4: | Option to Purchase |
| Attachment 5: | Record of Survey maps |
| Attachment 6: | Biological Assessment |

Summary














In summary, the conservation of the Rancho Seco property has been an ongoing effort on the part of the County and the Arizona Open Land Trust for many years. Pima County's acquisition of the private lands within Rancho Seco as well as management of the private and lease lands under an agreed upon resource management plan, will conserve important biological values, water resources, habitat for a number of Priority Vulnerable Species, and archeological resources. Altar Valley contains one of the largest unfragmented landscapes in eastern Pima County. With Rancho Seco making up a significant portion of this landscape, acquisition of this property is key in keeping Altar Valley intact and undeveloped.

Attachment 1: Location Map/Land Ownership

☐ Rancho Seco

Fee Owned Acres: 10,138
State Lease Acres: 21,662
Federal Lease Acres: 5,699

Land Ownership

- | | |
|---|------------------------------|
|  | BLM Land |
|  | State of Arizona Land |
|  | Pima County Land |
|  | Private Land |
|  | National Forest |
|  | Buenos Aires National Refuge |
|  | Conservation Easements |
|  | Administrative Boundaries |
|  | Township Lines |
|  | Section Lines |
|  | Sopori Wash |
|  | Ranch Headquarters |
|  | Ghost Town |

Pima County Index Map



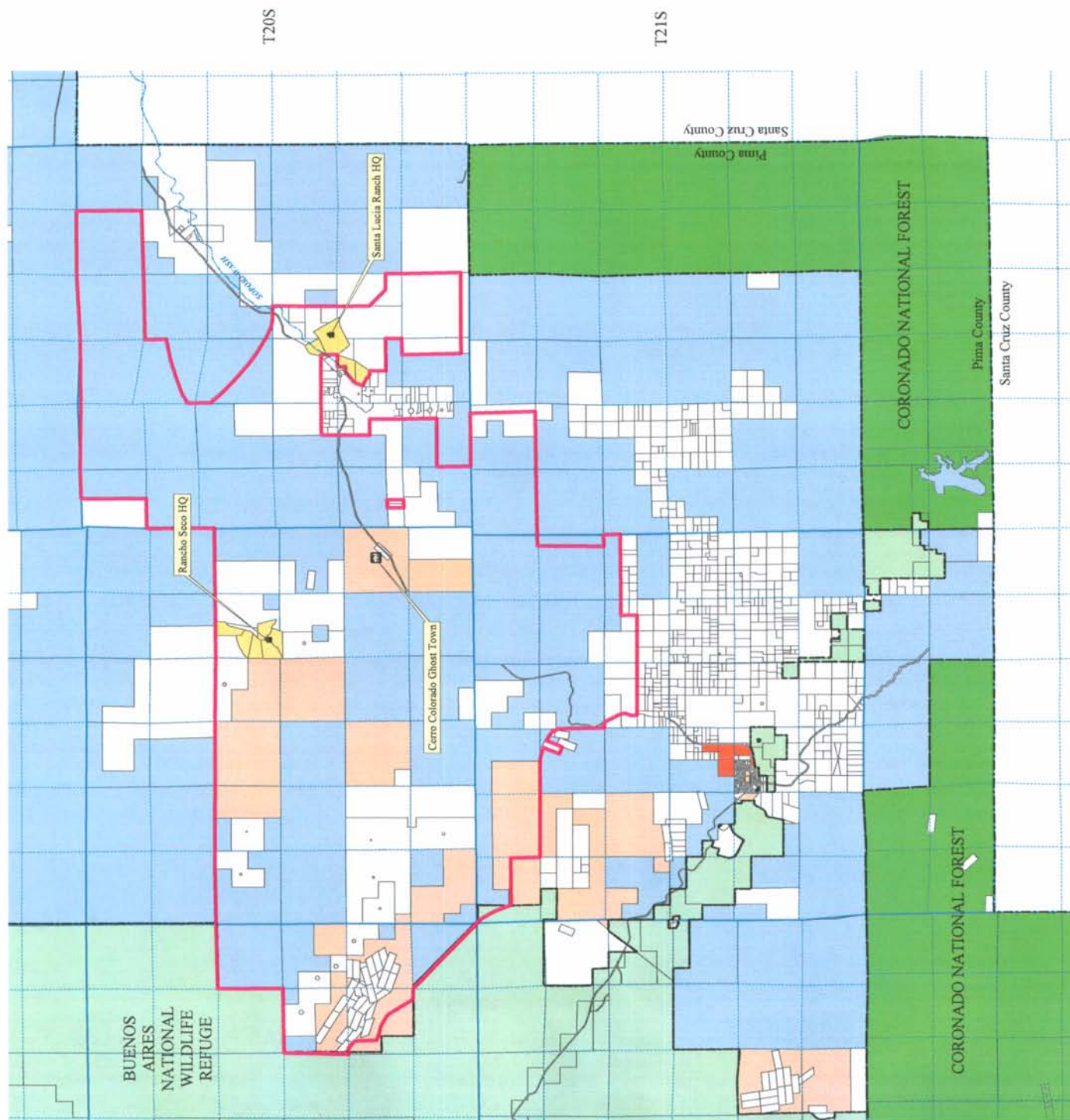
© 2000 Blackwell Science Ltd



Scale 1: 32,500

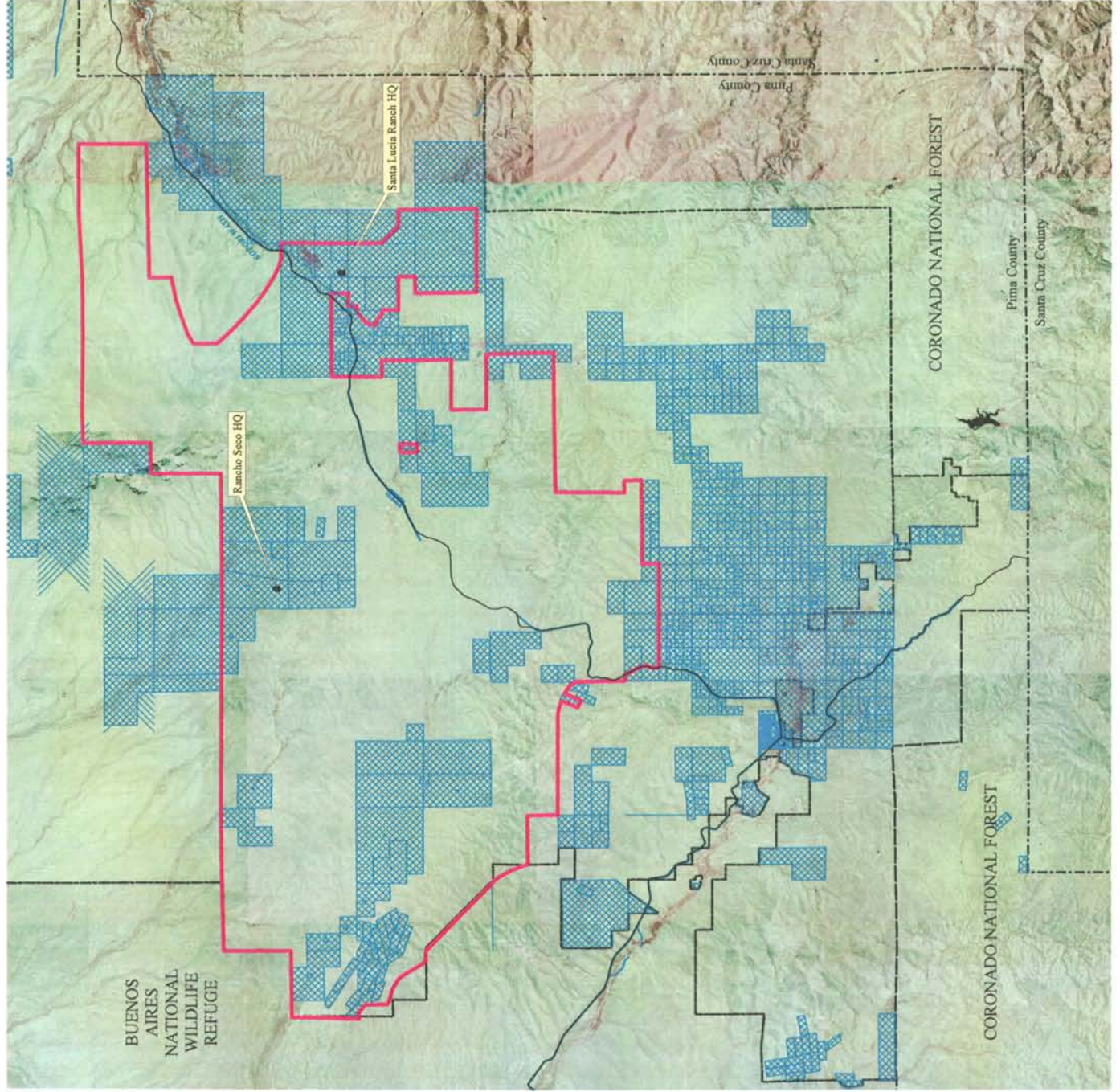


www.delftman.nl to include items has been successful and may

[illegible]

Attachment 2: Conservation Lands System / Habitat Protection Priorities Map

Attachment 3: Aerial Map



Rancho Seco / Santa Lucia Ranches

- Rancho Seco
- Ranch Headquarters
- Private Lands
- Administrative Boundaries
- ~ Sopor Wash
- / \ Major Roads

1996 USGS DOQ (Digital Ortho Quad)



The information depicted on this map is the result of a digital orthophoto mosaic (DOQ) derived from aerial photography. It is not a true photograph and should not be used for navigation or other purposes requiring high accuracy. The information is provided for informational purposes only. The information is not intended to be used for navigation or other purposes requiring high accuracy. The information is provided for informational purposes only.

Scale: 1:32,500



Attachment 4: Option to Purchase

OPTION TO PURCHASE AGREEMENT

This agreement (the "Agreement") is made between the following parties (the "Parties"):

- i. Arizona Open Land Trust ("AOLT"), an Arizona corporation ("Buyer");
and,
- ii. Hooker and Associates Limited Partnership, an Arizona limited partnership ("Seller").

For and in consideration of One Hundred Dollars (\$100.00), receipt of which is hereby acknowledged by Seller, and other good and valuable consideration, including mutual promises hereafter set forth and adequacy of which the Parties hereby acknowledge, and intending to be legally bound hereby, the Parties hereby agree as follows:

- 1 **Purpose of This Agreement.** Seller is the sole owner of that certain property more particularly described on **Exhibit "A"** attached hereto (the "Property"). Seller leases an additional 30,000 acres of land from the U.S. Bureau of Land Management, pursuant to Permit/Lease Nos. 06023 and 06186, and from the State of Arizona, pursuant to Grazing Lease No. 05-000389-00 (each a "Grazing Lease" and collectively the "Grazing Leases").

Seller desires to sell to Buyer, and Buyer desires to purchase, all of Seller's right, title, interest and claim in and to certain portions of the Property subject to the terms and conditions stated herein. The purpose of this Agreement is to set forth the terms and conditions upon which Buyer shall acquire an option to purchase and Seller shall grant the option to purchase such property to Buyer (the "Purchase"). Buyer intends to assign this Agreement to a third party (the "Conservation Buyer") to maintain the Property as a conservation area. The purchase price shall be \$18,500,000.00 cash at close of escrow.

\$18,500,000.00 **Total Acquisition Amount** (the "Acquisition Amount")

- 2 **Property Further Defined.** As used herein, the term "Property" means all rights, title and interest in the Property, excluding the "Seller Estates" as defined in **Paragraph 3** below, and all improvements and fixtures thereon; provided, however, that term shall not include and there shall be specifically excluded from the ranch purchase all personal property of Seller and all principals and partners of Seller, including but not limited to horses and livestock, feed, farm or ranch products, and moveable equipment, located on or used in connection with this property.
- 3 **Conservation Easement and Right of First Refusal.** Seller will retain fee title to a total of 480 acres of the Property together with all related and appurtenant easements, rights of way, fixtures, improvements and certain water and water rights, as more particularly provided in

Paragraph 3. Seller will retain a minimum of 40 acres around the headquarters at Rancho Seco ("Rancho Seco Estate," legal description to be attached as **Exhibit "B"**) and a minimum of 40 acres around the headquarters at the Santa Lucia ("Santa Lucia Estate", legal description to be attached as **Exhibit "C"**). The balance of the retained acreage (the "Retained Acreage" or "Retained Acres"), not to exceed 400 acres, will be divided between, and located adjacent to the headquarters at the Santa Lucia Estate and/or the Rancho Seco Estate as included and identified in Exhibits B and C (the Santa Lucia Estate, the Rancho Seco Estate and the Retained Acreage sometimes may be individually referred to herein as "Seller Estate" and collectively as "Seller Estates"). It is the intent of the parties that the Retained Acres of the Seller Estates may be divided into a total of ten parcels, excluding the Rancho Seco Estate and the Santa Lucia Estate, and a restriction to this effect shall be recorded at the Closing (as defined in **Paragraph 10**). Notwithstanding other provisions of this Agreement, Seller and the Conservation Buyer shall agree in writing to the exact location and legal descriptions for the Seller Estates and shall attach such documentation to this Agreement during the period between the Agreement Date and February 18, 2005 ("Documentation Period"). Seller shall grant to Conservation Buyer a right of first refusal ("Seller Estates Right of First Refusal") with respect to the Seller Estates. The Seller Estates Right of First Refusal shall be in a recordable form agreed to by Seller and Conservation Buyer during the "Documentation Period", and shall provide the Conservation Buyer with a right to purchase the Seller Estates, or any part thereof, on those same terms offered to a third party purchaser or transferee.

Seller shall, at Closing, grant conservation easements ("Conservation Easements") to the Conservation Buyer over the Seller Estates, pursuant to easement documents satisfactory to the Conservation Buyer and Seller and agreed upon during the Documentation Period. The Conservation Easements will provide that division of the Retained Acres of the Seller Estates, whether conveyed or not, shall be limited to a total of ten parcels. The Conservation Easements will define permitted and prohibited uses of the Seller Estates and describe the rights of the Conservation Easement holder to enter upon, inspect and monitor the Seller Estates.

At Closing, Seller shall grant to Conservation Buyer a right of first refusal (the "Lease Right of First Refusal") to assume any and all Grazing Lease(s) or to sublease the property subject to any Grazing Lease in the event that Seller elects to release, transfer or assign its interest in such Grazing Lease(s), terminate the Grazing Lease(s), or transfer or sell all or any portion of the property that is the subject of such Grazing Lease. Seller will grant the Lease Right of First Refusal to Conservation Buyer in a document, to be delivered and recorded at Closing, in a form acceptable to Conservation Buyer and Seller, subject to all applicable terms and conditions as may be imposed upon Conservation Buyer by an issuing agency under such Grazing Lease(s) and agreed to during the Documentation Period.

It is the intent of the parties that certain water rights pertaining to the Seller Estates shall be retained by Seller in order to permit Seller to continue to use the existing irrigation water rights on the Seller Estates for ranching operations. It is understood by the Conservation Buyer and the Seller that all non-irrigation water rights that are now existing and permitted as appurtenant to or in connection with all uses on the Property and the Seller Estates, and all water rights existing and permitted as appurtenant to the Property will be conveyed to the

Conservation Buyer at Closing in consideration of payment of the Acquisition Amount and that such conveyance will be agreed to by both the Conservation Buyer and Seller during the Documentation Period. It is understood by the Conservation Buyer and the Seller that Seller shall retain the right to continue to utilize all irrigation water rights that are now existing and permitted as appurtenant to or in connection with all permitted uses on the Property and further defined under the Conservation Easements for the Seller Estates. It is also understood and agreed to by Conservation Buyer and Seller that the Seller shall continue to use the water rights to operate and manage the Property and the Seller Estates and shall not increase the amount of water used for that purpose above the highest amount of water used per year in any of the three calendar years of 2000, 2001, 2002. During the Documentation Period, Seller shall provide to Buyer all documents and information related to the water rights now existing and permitted and appurtenant to the Property and the Seller Estates (the "Water Rights"), and Seller and the Conservation Buyer shall agree to the form of all conveyance documents related to the water rights and the form of the restrictions related to Seller's water use on the Seller Estates which conveyance documents and restrictions shall be delivered at Closing in recordable form, as appropriate. It is understood and agreed by Seller and Conservation Buyer, except as agreed to during the Documentation Period, that all Water Rights that are now existing and permitted as appurtenant to or in connection with all permitted uses, under the Conservation Easements pertaining to the Rancho Seco Estate and/or the Santa Lucia Estate shall continue to be permissible and permitted waters, water uses, and water rights for each such respective Seller Estate (the "Seco and Lucia Water Rights") during the period of Seller's ownership. During the Documentation Period, Seller shall provide to Buyer all documents and information related to the Property, the Seco and Lucia Water Rights (Retained Acres), Rancho Seco Estate and the Santa Lucia Estate and Seller and Conservation Buyer shall agree to the form of restrictions related to Seller's water use on the Rancho Seco Estate, the Santa Lucia estate and the Retained Acres as part of the Conservation Easements. During the Documentation Period, Seller shall provide to Buyer all documents and information related to the Property, the Seco and Lucia Water Rights (Retained Acres), Rancho Seco Estate and the Santa Lucia Estate and Seller and Conservation Buyer shall agree to the form of restrictions related to Seller's water use on the Rancho Seco Estate, the Santa Lucia estate and the Retained Acres as part of the Conservation Easements.

- 4 **Obligation to Close and Assignment to Third Party.** Buyer's obligation to close is contingent and conditioned upon its approval, in Buyer's sole discretion, or waiver of approval, of all conditions on the Property subject to inspection as described below in **Paragraph 5**, and all other inspection provisions in this Agreement, and approval of the preliminary commitment for title insurance to be issued under the terms of this Agreement. Such approval, or waiver of approval, shall be a written "Notice of Intent to Close Escrow" and shall be delivered to the Escrow Agent (defined at **Paragraph 9**) on or before April 16, 2005. The Parties understand and agree that: (i) Buyer is unable, without the assistance of another party, to purchase the subject Property and that to accomplish the purchase it intends to assign the Agreement to a third party (the "Conservation Buyer") to maintain the Property as a conservation area; and that (ii) Buyer and the Conservation Buyer's obligation to close escrow, is contingent and conditioned upon all of the following: (a) prior approval by Buyer's Board of Directors, (b) an executed assignment and assumption of all of Buyer's rights and obligations in this Agreement to the Conservation Buyer, (c) an executed

acceptance of said assignment and assumption of all of Buyer's duties and obligations under this Agreement by the Conservation Buyer, (d) an executed unconditional release and hold harmless of Buyer by the Seller (which shall not be unreasonably withheld by Seller), and (e) delivery of all other documents (including the Conservation Easements, Ranch Management Agreement, the Seller Estates Right of First Refusal, the Lease Right of First Refusal, and the water rights documents and the agreement as to the location of the Seller Estates described at **Paragraph 3** above), and satisfaction of all other contingencies for Closing, as set forth herein. Buyer's approval of the foregoing conditions and documents may be withheld in Buyer's sole discretion.

- 5 **Inspection and Access.** During the term of this Agreement, but prior to March 1, 2005, Buyer (and its employees, agents and representatives) including any Conservation Buyer assignee (and their respective employees, agents, and representatives) shall have the right to enter upon the Property at reasonable times and from time to time, upon reasonable notice to Seller, for the purpose of such viewing, inspecting, testing, appraising, surveying and studying the Property as Buyer in its sole discretion shall deem advisable. In all such instances, Conservation Buyer shall have and maintain the following insurance at its sole cost and expense: (a) comprehensive (also known as commercial) general liability insurance on an "occurrence" basis against claims for "personal injury" liability and liability for death, bodily injury and damage to property, products and completed operations, in limits agreed to by Conservation Buyer and Seller with respect to any one occurrence and the aggregate of all occurrences during any given annual policy period, and (b) workers' compensation insurance for all employees of Buyer and Conservation Buyer, as applicable, in such amount as is required by Arizona laws and regulations. Buyer shall, promptly following any such viewing, inspecting, testing, and studying, return the Property to the condition it was in immediately prior to such viewing, inspecting, testing, appraising, surveying or studying. The Buyer shall, and does hereby agree to, indemnify the Seller against, and hold the Seller harmless from, all claims, damages, expenses, and actions arising from or related to any such viewing, inspecting, testing, appraising, surveying, or studying. Buyer shall provide written notice to Seller of any items reasonably disapproved on or before March 1, 2005. If environmental inspections do not specifically identify contamination but indicate a potential for contamination and recommend further testing or inspection, the parties hereby agree to extend the date of Closing up to thirty (30) days to allow for such additional inspection. If any environmental inspection reveals the presence of contamination or the need to conduct environmental clean up, Seller shall conduct a clean up of the Property adequate to bring the Property into compliance with environmental regulations prior to Closing or Buyer may terminate this Agreement.
- 6 **Term of this Agreement.** The option to purchase granted in this Agreement shall expire on April 16, 2005 in the event the Pima County Board of Supervisors has not unconditionally approved the Purchase and the Conservation Buyer has not executed and delivered its Notice of Intent to Close Escrow to the Escrow Agent (defined at **Paragraph 9**).
- 7 **Risk of Loss for Damage to Improvements.** Seller shall be responsible for the risk of loss for any and all damage to any improvements on the Property prior to Closing.

- 8 **No Salvage.** The Seller shall not salvage or remove any fixture, improvements, vegetation other than forage consumed in connection with Seller's ongoing ranching operations, in the ordinary course of that business), or any portion of the Property prior to Closing.
- 9 **Escrow and Title Company.** The Title Agent and Escrow Company shall be Robin March of Stewart Title & Trust of Tucson and this Agreement shall be used as escrow instructions. Upon execution of this Agreement, Escrow Company is instructed to obtain and distribute to Buyer and Conservation Buyer a Commitment for Title Insurance together with complete and legible copies of all documents which will remain as exceptions to Buyer's Title Insurance Policy. The cost of the commitment and the policy for title insurance shall be paid in accordance with **Paragraph 17.**
- 10 **Closing.** The Closing ("Closing") of the Purchase shall take place at the offices of the Escrow Company or at such other location in Tucson, Arizona as the Parties can agree upon on or before the later of (a) May 31, 2005 or (b) 30 days after receipt of all necessary releases or consents from current Lienholders of the Property (as described at **Paragraph 13**).
- 11 **Payment Terms.** The Acquisition Price and Closing Costs shall be paid in cash in United States funds immediately available in Tucson, Arizona or on such payment terms as are acceptable to Seller and Buyer.
- 12 **Escrow and Prorations.** (a) The Closing date shall be used for proration of rents, property taxes and other similar costs, (b) assessments due for improvement districts shall be paid in full by the Seller at Closing, and (c) property taxes shall be prorated based upon: 1) the date of Closing, and if applicable, 2) the size of the Property. If the Property, or any portion thereof, is part of a larger parcel with a single tax parcel number, taxes shall be prorated based upon the acreage of the Property within such parcel as compared to the remainder of the parcel.
- 13 **Security Interest.** Monies payable under this Agreement may be due holders (the "Lienholders") of certain notes secured by mortgages or deeds of trusts, up to and including the total amount of unpaid principal, interest and penalty on the notes, if any, and shall, upon demand by the Lienholders, be paid to the Lienholders. Seller shall obtain from the Lienholders releases for any fee transfer and consents for the Conservation Easements for the Seller Estates.
- 14 **Delivery of Possession and Use.** Seller shall deliver to Buyer possession of the Property at Closing. Seller shall during the term of this Agreement use the Property on a basis substantially comparable to the historical use thereof. Seller shall make no use of the Property other than the use being made thereof as of the Agreement Date (hereinafter defined). Seller shall, pending Closing, maintain the Property in substantially the same condition as it is presently maintained, ordinary wear and tear excepted, and shall not further encumber the Property or convey any interest therein to any other party.
- 15 **Retained Use and Property Management.** The Seller, or the Seller's principals (Jon C. Rowley, Peggy Ann Rowley, husband and wife; and Robert H. Rowley and Dorothy W. Rowley, husband and wife), as the "Manager," and Conservation Buyer, as the "Owner",

intend to enter into (and Closing is contingent upon the parties entering into) an agreement for post-closing management of the Property ("Ranch Management Agreement"), with the material terms as set forth herein. The Manager shall operate and manage the Property on a basis substantially comparable to the historical and current use thereof, at Manager's own expense, for ten years from the date of Closing. The right to continue utilizing the Property for ranching purposes (in a manner consistent with Owner's conservation goals) shall be consideration for Manager's provision of management, security, and conservation services under the Management Agreement. Owner shall have full access to the Property during the term of the Management Agreement, and to all resources and facilities that the Manager employs in operation of the Property for livestock grazing and related purposes specifically excluding the Seller Estates, for the purpose of viewing, inspecting, testing, and monitoring the Manager's use and operation of the Property in a manner consistent with the intent and purposes of the Management Agreement. The Owner shall, however, give the Manager two weeks prior notice in writing regarding any entry or inspection that might impact Manager's operations, and shall coordinate such entry or inspection with Manager. Manager shall have the right to assign, convey, give or devise, or in any other manner transfer, their rights and obligations under the Management Agreement to anyone other than one or more of the aforementioned named Manager and no Manager shall have any right to encumber the Property or any interest therein, of whatever description, kind or manner, in any way.

Manager may utilize existing houses for ranch employees situated upon the Property, to be designated by Manager. Manager, in connection therewith, shall not be entitled to and shall not encumber the Property or any physical facilities or equipment on or belonging to the Property, and shall not increase the number of cattle grazed on the Property above the highest number of head grazed per year in any of the three calendar years of 1997, 1998 and 1999. Nothing in this Agreement shall require the Manager to graze cattle in any specific year beyond what is required to maintain and renew the Grazing Leases. Manager shall make no use of the Property other than the use being made of the Property as of the Agreement Date, and as specified in the Ranch Management Agreement. Manager shall maintain the Property at its sole costs and expense, in substantially the same condition as it is presently maintained, ordinary wear and tear excepted. Manager shall repair or replace existing improvements with improvements that are similar in size, location, use, and character, including similar materials and compatible design and appearance, to such existing improvements. All such improvements shall become the property of the Owner immediately upon construction or installation.

- 16 **Deliveries by Seller at Closing.** At the Closing, Seller and Buyer shall deliver the following:
 - 16.1 One or more warranty deeds executed and acknowledged by Seller conveying fee simple title to the Property (other than Seller Estates) to the Conservation Buyer, free and clear of all liens, claims and encumbrances except those listed on **Exhibit "D"** (the "Permitted Encumbrances").
 - 16.2 One or more assignments in usual and customary form, approved by counsel to the Seller and Conservation Buyer (provided such approvals are not unreasonably withheld, delayed or denied), executed and acknowledged by Seller conveying to the

Conservation Buyer certain Water Rights and well registrations certificated or claimed appurtenant to the Property owned by the Seller as provided at **Paragraph 3** above.

- 16.3 Fully executed and acknowledged documents restricting Seller's water use with respect to, and any subdivision of, the Seller Estates as provided at **Paragraph 3** above.
- 16.4 Seller's Title Insurance Policy on the Property in the amount of the Acquisition Price.
- 16.5 The fully executed and acknowledged Ranch Management Agreement.
- 16.6 The fully executed and acknowledged Conservation Easements over the Seller Estates.
- 16.7 The fully executed and acknowledged Seller Estates Right of First Refusal and Lease Right of First Refusal.
- 16.8 The final designation, by Seller and Conservation Buyer, of the lands to be included in the Seller Estates.
- 16.9 Payment by Conservation Buyer to Seller of all amounts payable hereunder.
- 16.10 Such additional documents as the Seller, Buyer or Conservation Buyer may reasonably require.

All of the foregoing documents shall be in form appropriate for recording or filing, as applicable, and such recording and filing shall take place at the Closing.

- 17 **Escrow and Closing Costs.** It is the intent of the Seller to preserve and protect the conservation values of their property for all generations, present and future, by selling its property to a Conservation Buyer. Seller acknowledges the advantage of working with AOLT to carry out its conservation purposes by engaging AOLT to identify and secure a suitable Conservation Buyer for the Ranch Property. Seller agrees to execute this Option with AOLT for purchase of the Property and facilitate transfer of the Property to a Conservation Buyer of AOLT's choice. It is understood that the Seller will pay all customary Closing costs including all expenses incidental to the transfer of title including title reports, recording fees, messenger and courier fees, escrow fees, releases, and including the cost of a Title Insurance Policy in favor of the Conservation Buyer on the Property
- 18 **Seller's Warranties.** Seller hereby warrants that, except as disclosed in writing to Buyer within 10 days of the execution of this Agreement: (i) It is aware of no environmental conditions on the Property that would constitute a violation of any environmental law of the United States or the State of Arizona and that there are no proceedings pending or threatened by any agency, court or other governmental entity related to environmental conditions on the Property; and that there are no pollutants, contaminants, toxic or hazardous substances, and that no wastes or materials have been by Seller or to Seller's knowledge stored, used or are located on the Property, or within any surface or subsurface waters thereof; and that no underground storage tanks have been located on the Property; (ii) there are no pending or threatened administrative proceedings, arbitrations, lawsuits or other legal proceedings or claims by governmental agencies or third parties concerning the Property which would in

anyway affect, encumber or limit Conservation Buyer's fee title ownership of the Property after Closing; (iii) it has no knowledge of any notice of violations by any governmental agency of applicable local, state or federal ordinance, statutes, regulations or rules whether filed or threatened regarding the Property; (iv) none of the water rights and well registrations held by Seller have been lost by passage of time, failure to comply with any laws or regulations or by any sale or transfer to third parties during Seller's ownership of the Property.

- 19 **Environmental Liability.** The Buyer and the Seller agree that none of these parties is assuming any obligation of the other party relating to any potential liability, if any, arising from the environmental condition of the Property, each party remaining responsible for its obligations as set forth by law.
- 20 **Leases.** Seller represents that the leases identified in **Exhibit "E"**, attached hereto, are the only leases, rental agreements, or agreements permitting someone to use or occupy the Property and that Seller will provide Buyer with copies of all such agreements or leases.
- 21 **No Encumbrances.** Seller shall not encumber the Property before Closing, nor sell or exchange all or any portion of the Property before the later to occur of the expiration of the term of this Agreement, as provided in Paragraph 6, or the Closing.
- 22 **Survival of Representations and Warranties.** All representations and warranties contained herein shall survive the Closing for two years.
- 23 **No Buyer Broker's Commission.** The Buyer represents and warrants to the Seller that the Buyer has not engaged any broker, real estate agent, finder, or other person, who will be entitled to any brokerage or commission or fee arising out of the Purchase.
- 24 **Default, Remedies, and Conditions Precedent.** In the event that either party shall default under this Agreement, the other party shall be entitled to pursue all rights and remedies available at law or in equity.
- 25 **Miscellaneous Provisions.** The following miscellaneous provisions shall apply to this Agreement:
 - 25.1 All notices or advices required or permitted to be given by or pursuant to this Agreement, shall be given in writing. All such notices and advices shall be (i) delivered personally, (ii) delivered by facsimile or by the U.S. Postal Service, or (iii) delivered for overnight delivery by a nationally recognized overnight courier service. Such notices and advices shall be deemed to have been given (i) the first business day following the date of delivery if delivered personally or by facsimile, (ii) on the third business day following the date of mailing if mailed by U.S. Postal Service, or (iii) on the date of receipt if delivered for overnight delivery by a nationally recognized overnight courier service. All such notices and advices and all other communications related to this Agreement shall be given as follows:

If to Seller:

Name

Address

City, State Zip

Telephone

Facsimile

If to Buyer:

Diana Barnes Freshwater, Executive Director
Arizona Open Land Trust, Inc.
1915 East Camino Miraval, Tucson, Arizona 85718
520.577.8564 - Telephone
520.577.8574 - Facsimile

Copy to:

Manager, Pima County Real Property Services
201 North Stone Avenue, 6th Floor
Tucson, Arizona 85701

Copy to:

K. Alexander Hobson
Duffield, Young and Adamson, P.C.
3430 East Sunrise Road, Suite 200
Tucson, Arizona 85718
520.792.1181 - Telephone
520.792.2859 - Facsimile

Or to such other address as the party may have furnished to the other parties in accordance herewith, except that notice of change of addresses shall be effective only upon receipt.

- 25.2 This Agreement is made and executed in Pima County, Arizona.
- 25.3 This Agreement shall be subject to, and interpreted by and in accordance with, the laws (excluding conflict of law provisions) of the State of Arizona.
- 25.4 This Agreement is the entire Agreement of the parties respecting the subject matter hereof. There are no other agreements, representations or warranties, whether oral or written, respecting the subject matter hereof.
- 25.5 This Agreement, and all the provisions of this Agreement, shall be deemed drafted by all of the parties hereto.


- 25.6 This Agreement shall not be interpreted strictly for or against any party, but solely in accordance with the fair meaning of the provisions hereof to effectuate the purposes and intent of this Agreement.
- 25.7 Each party hereto has entered into this Agreement based solely upon the agreements, representations and warranties expressly set forth herein and upon his own knowledge and investigation. Neither party has relied upon any representation or warranty of any other party hereto except any such representations or warranties as are expressly set forth herein.
- 25.8 Each of the persons signing below on behalf of a party hereto represents and warrants that he or she has full requisite power and authority to execute and deliver this Agreement on behalf of the parties for whom he or she is signing and to bind such party to the terms and conditions of this Agreement.
- 25.9 This Agreement may be executed in counterparts, each of which shall be deemed an original. This Agreement shall become effective only when all of the parties hereto shall have executed the original or counterpart hereof. This Agreement may be executed and delivered by a facsimile transmission of a counterpart signature page hereof.
- 25.10 In any action brought by a party hereto to enforce the obligations of any other party hereto, the prevailing party shall be entitled to collect from the opposing party to such action such party's reasonable litigation costs and attorneys fees and expenses (including court costs, reasonable fees of accountants and experts, and other expenses incidental to the litigation).
- 25.11 This Agreement shall be binding upon and shall inure to the benefit of the parties and their respective successors and assigns.
- 25.12 This is not a third party beneficiary contract. No person or entity other than a party signing this Agreement or a permitted assignee shall have any rights under this Agreement.
- 25.13 This Agreement may be amended or modified only in a writing signed by the parties, which specifically references this Agreement.
- 25.14 This Agreement may be assigned by Buyer, in its sole discretion, to a third party, and upon Buyer's assignment to the third party and the third party's assumption of Buyer's obligations hereunder, Buyer shall be released from all further obligations under this Agreement. Seller shall not be permitted to assign its rights or obligations hereunder.
- 25.15 Nothing in this Agreement shall be construed to create a partnership or joint venture, or to authorize any party hereto to act as agent for or representative of any other party hereto. Each party hereto shall be deemed an independent contractor and no party hereto shall act as, or hold itself out as acting as, agent for any other party hereto.

25.16 A party to this Agreement may decide or fail to require full or timely performance of any obligation arising under this Agreement. The decision or failure of a party hereto to require full or timely performance of any obligation arising under this Agreement (whether on a single occasion or on multiple occasions) shall not be deemed a waiver of any such obligation. No such decisions or failures shall give rise to any claim of estoppel, laches, course of dealing, amendment of this Agreement by course of dealing, or other defense of any nature to any obligation arising hereunder.

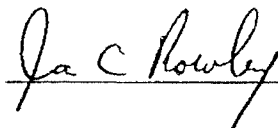
25.17 The repudiation, breach, or failure to perform any obligation arising under this Agreement by a party after reasonable notice thereof shall be deemed a repudiation, breach, and failure to perform all of such party's obligations arising under this Agreement.

25.18 Time is of the essence with respect to each obligation arising under this Agreement. The failure to timely perform an obligation arising hereunder shall be deemed a failure to perform the obligation.

Arizona Open Land Trust, a nonprofit Arizona corporation ("Buyer")

By  Authorized Representative

Hooker Associates ("Seller")

By 
1/14/05 ("Agreement Date")

: Exhibit "A"
Legal Description

Exhibit "B"
Rancho Seco Estate

Exhibit "C"
Santa Lucia Estate

Exhibit "D"
Permitted Encumbrances

Exhibit "E"
Leased Ranch Lands Leases

Attachment 5: Record of Survey Maps

12 MILES
CEDEO COLORADO, ARIZ.

LOT 225 THRU 232
BOOK 21 PAGE 19 R.O.S. SHTS 1 - 2

LOT 69 THRU 145
BOOK 20 PAGE 68 R.O.S. SHTS 1 - 7

LOT 146 THRU 200
BOOK 21 PAGE 17 R.O.S. SHTS 1 - 5

LOT 247 THRU 251
BOOK 21 PAGE 23 R.O.S. SHTS 1 OF 1

BUE NOS
ADDER
LADDER
REMARKS

HOLKINS
TANK

Seco
Squar
HILL

Coloado
TANK

Coloado
TANK

Coloado
TANK

Coloado
TANK

Coloado
TANK

Coloado
TANK

Coloado
TANK

LOT 201 THRU 224
BOOK 21 PAGE 18 R.O.S. SHTS 1 - 6

LOT 252 THRU 261
BOOK 21 PAGE 24 R.O.S. SHTS 1 - 3

AKOON ROAD

LAZ GUARDS MTNS.

ROMOSA
WEN

LOT 247 THRU 251
BOOK 21 PAGE 23 R.O.S. SHTS 1 OF 1

RED = FED.
BLUE = PRIVATE.
GOLD = STATE.

FEATURE LEGEND
Section Lines & 1/4 Line
Property Boundary Lines
New Parcel Division Lines
Access Roads 10' or 15'

RANGE 9 EAST
RANGE 10 EAST

RANGE 10 EAST
RANGE 11 EAST

LOT 233 THRU 246
BOOK 21 PAGE 22 R.O.S. SHTS 1 - 3

WILBUR CANYON, ARIZ.

ARIZONA, ARIZ.

MURPHY PEAK, ARIZ.

04-58 sections 37, 40, 42

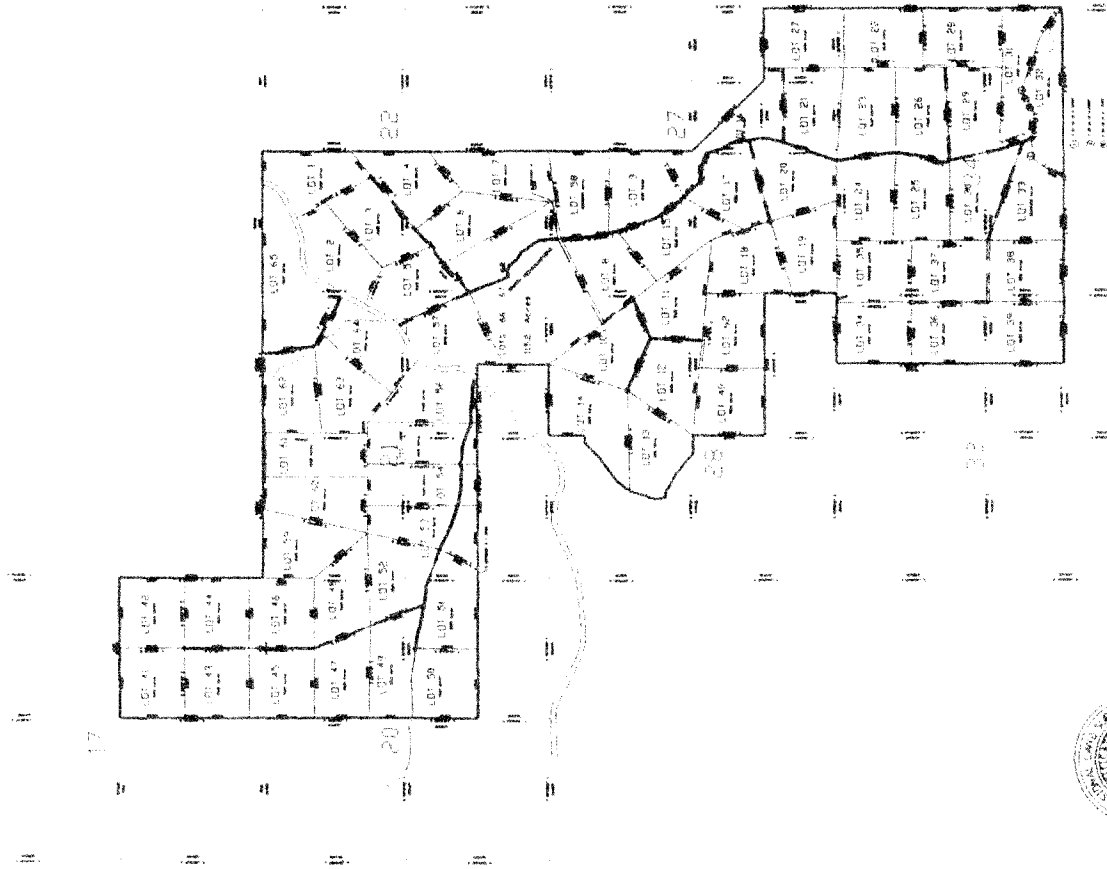
0 1000 2000
FEET



TOWNSHIP 21 NORTH RANGE 11 EAST

TOWNSHIP 21 NORTH RANGE 10 EAST

TOWNSHIP 21 NORTH RANGE 9 EAST



(17)		
(20)	(21)	(22)
	(28)	(27)
	(33)	(34)

Location Map

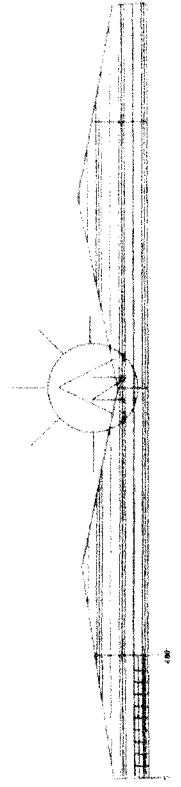
Portions of Sections
17, 20, 21, 22, 27, 28,
33 & 34, Township 20,
South Range 11, East
G.&S.R.M. Pima County, AZ.

FEATURE LEGEND

- Section Lines & 1/4 Lines
- Property Boundary Lines
- New Parcel Division Lines
- Access Roads (30' Typ)



LEON ZUCARELLI, PLS. MME SCHERRER, PLS
ZUCARELLI SCHERRER ASSOCIATES
2410 E. 24TH STREET, TUCSON, ARIZONA 85710
(520) 624-5802 (520) 616-7953 mcs@azs.com



2
4
6
8
10

Portions of Sections

23, 24, 25, 26

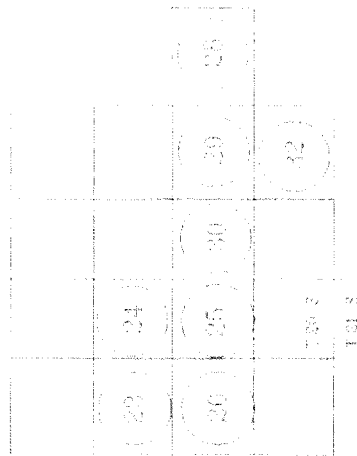
Township 20 South, Range 9 East,

and Sections

28, 29, 30, & 32

Township 20 South, Range 10 East,

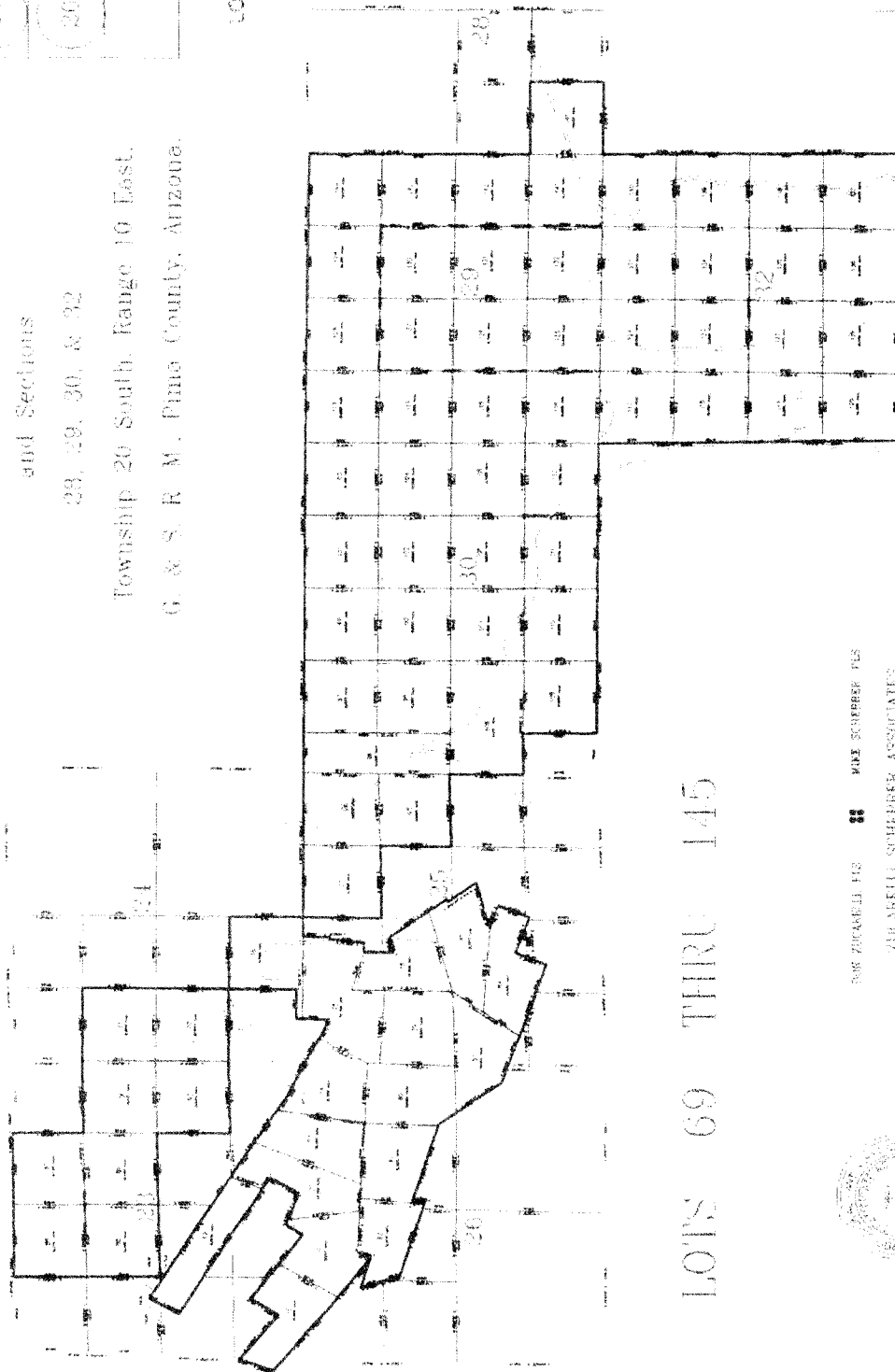
G. & S. R. M. Pima County, Arizona.



LOCATION MAP 1" = MILE

FEATURE LEGEND

- Section Lines & 1/4 Lines
- Property Boundary Lines
- New Parcel Division Lines
- Access Roads 10' to 15'



LOTS 69 THRU 145

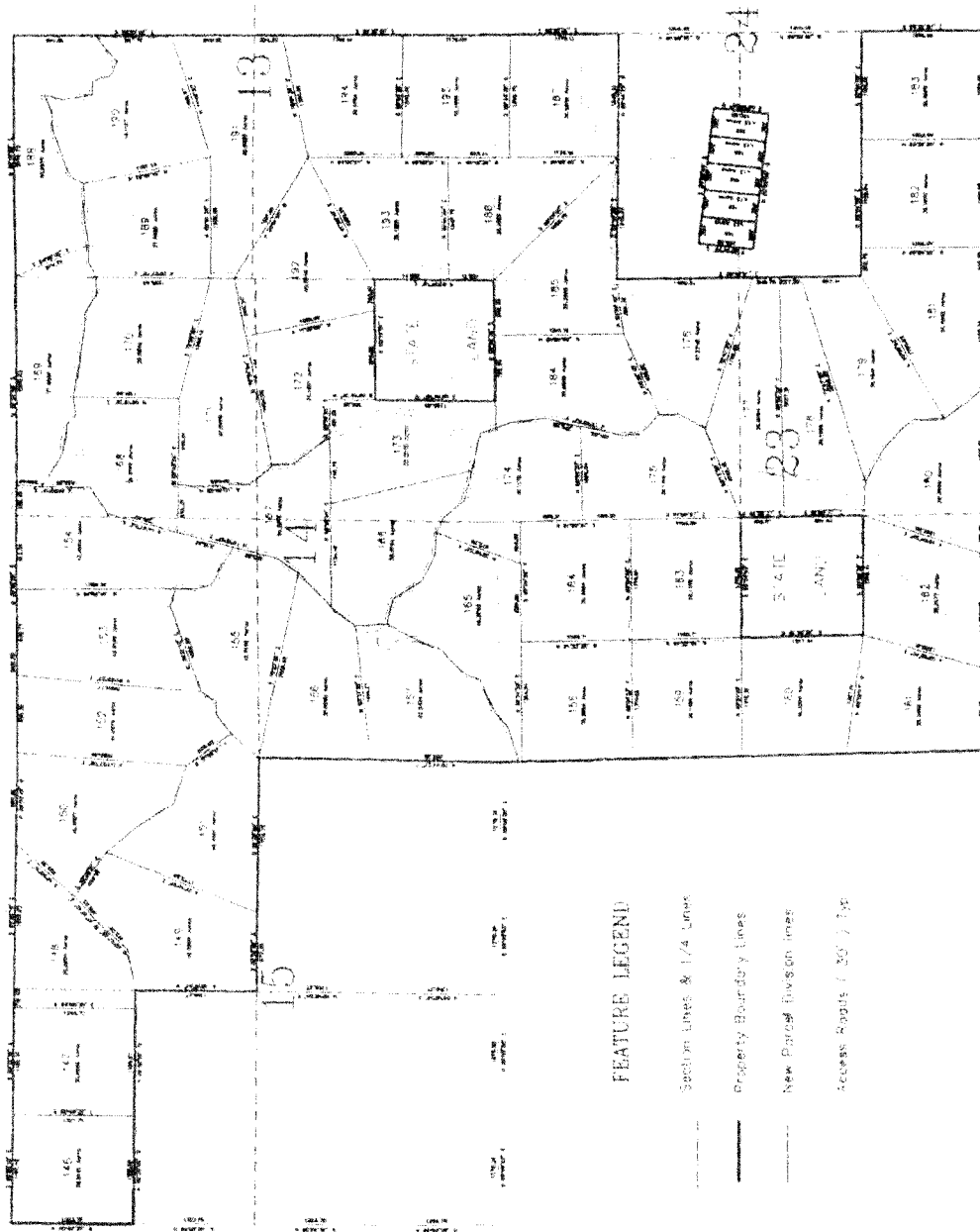


MARK SCHERRER, PLS
240 ARELLI SCHERRER ASSOCIATES
7410 E. 14TH STREET, TUCSON, ARIZONA 85710
(520) 624-2400 (520) 616-7950 mark@scherrers.com



0 400

LOTS 146 THRU 200



FEATURE LEGEND

- Section Lines & 1/4 Lines
- Property Boundary Lines
- New Parcel Division Lines
- Access Roads (30' / Typ)



DON ZUCARELLI PLS 11 MIKE SCHERRER, PLS
ZUCARELLI SCHERRER ASSOCIATES
2419 E. 24th STREET, TUCSON, ARIZONA 85713
(520) 824-5652 (502) 615-1753 mcsa@aol.com

15	14	13
24	23	22
21	20	19

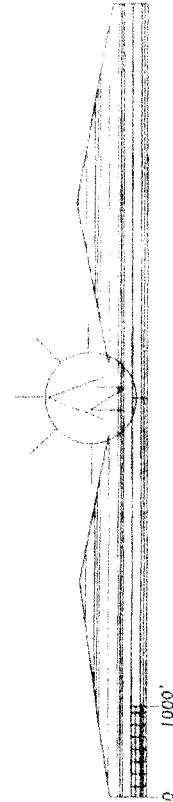
LOCATION MAP 1" = MILE

Portions of Sections

13, 14, 15, 23 & 24

Township 20 South, Range 10 East,

G. & S. R. M. Pima County, Arizona.



RECORD OF SURVEY

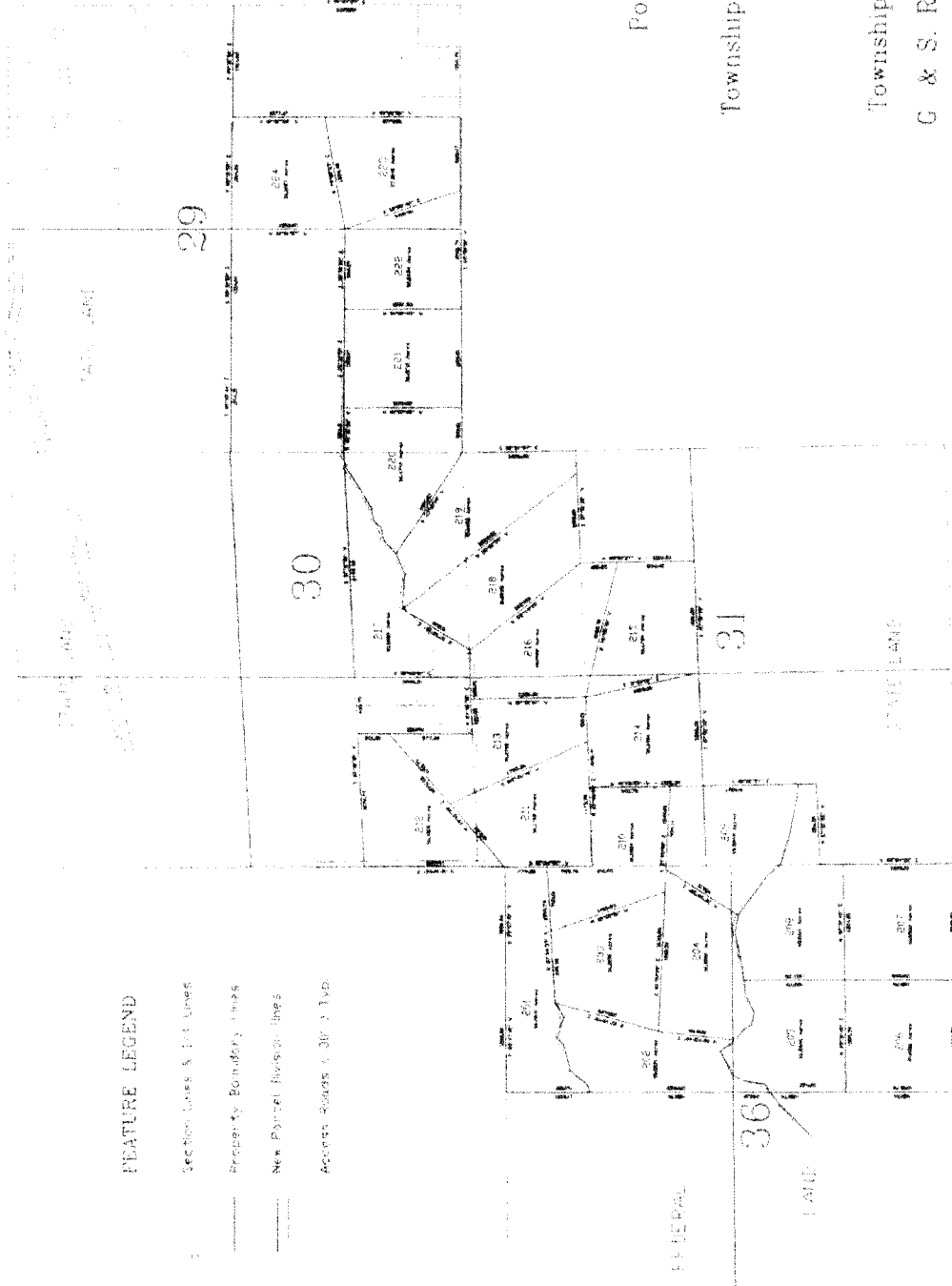
LOTS 201 THRU 224

SHEET 1 OF 4

2 3
21 22
23 24

		(30)	(39)
		(36)	(31)
T 20 S			
T 21 S			

LOCATION MAP 1" = MILE

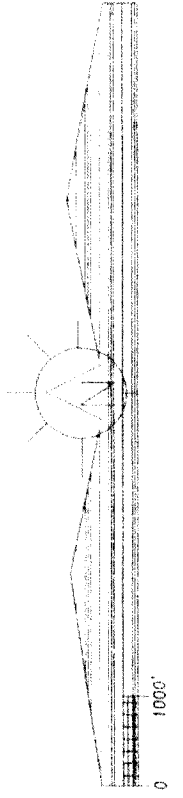


Portions of Sections
29, 30, 31
Township 20 South, Range 11 East,
and Section
36

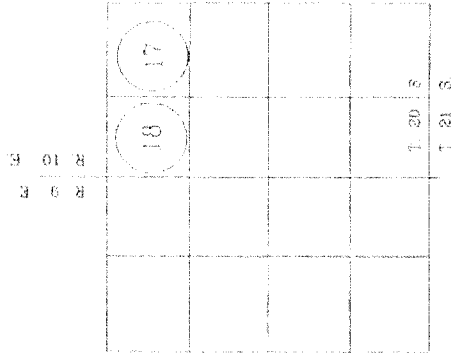
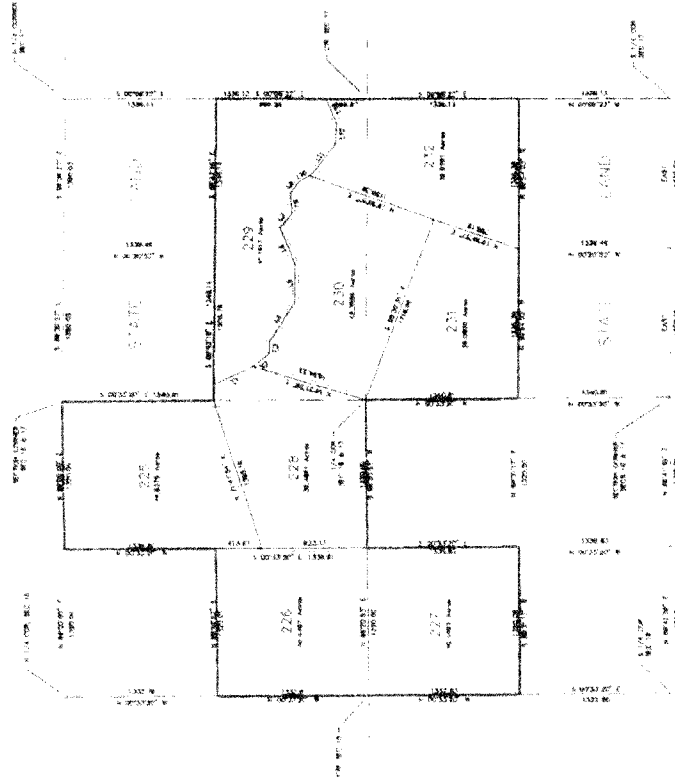
Township 20 South, Range 10 East,
G & S. R. M., Pima County, Arizona.



DON ZUCARELLI, PLS. MIKE SCHERER, PLS.
ZUCARELLI SCHERER ASSOCIATES
2419 E. 24TH STREET, TULSON, ARIZONA 85713
(502) 824-5852 (502) 616-7953 rzsch@csol.com



LOTS 225 THRU 232



LOCATION MAP 1" = MILE

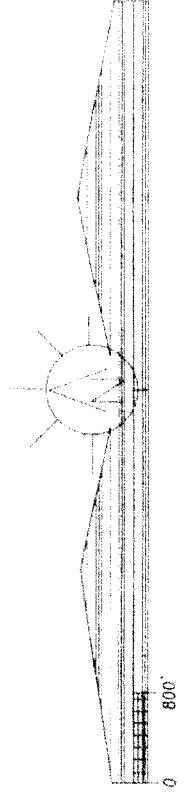
FEATURE LEGEND

- Section Lines & 1/4 Lines
- Property Boundary Lines
- New Parcel Division Lines
- Access Roads (30' Wide)

Portions of Sections
17 & 18
Township 20 South, Range 10 East,
G. & S. R. M., Pima County, Arizona.



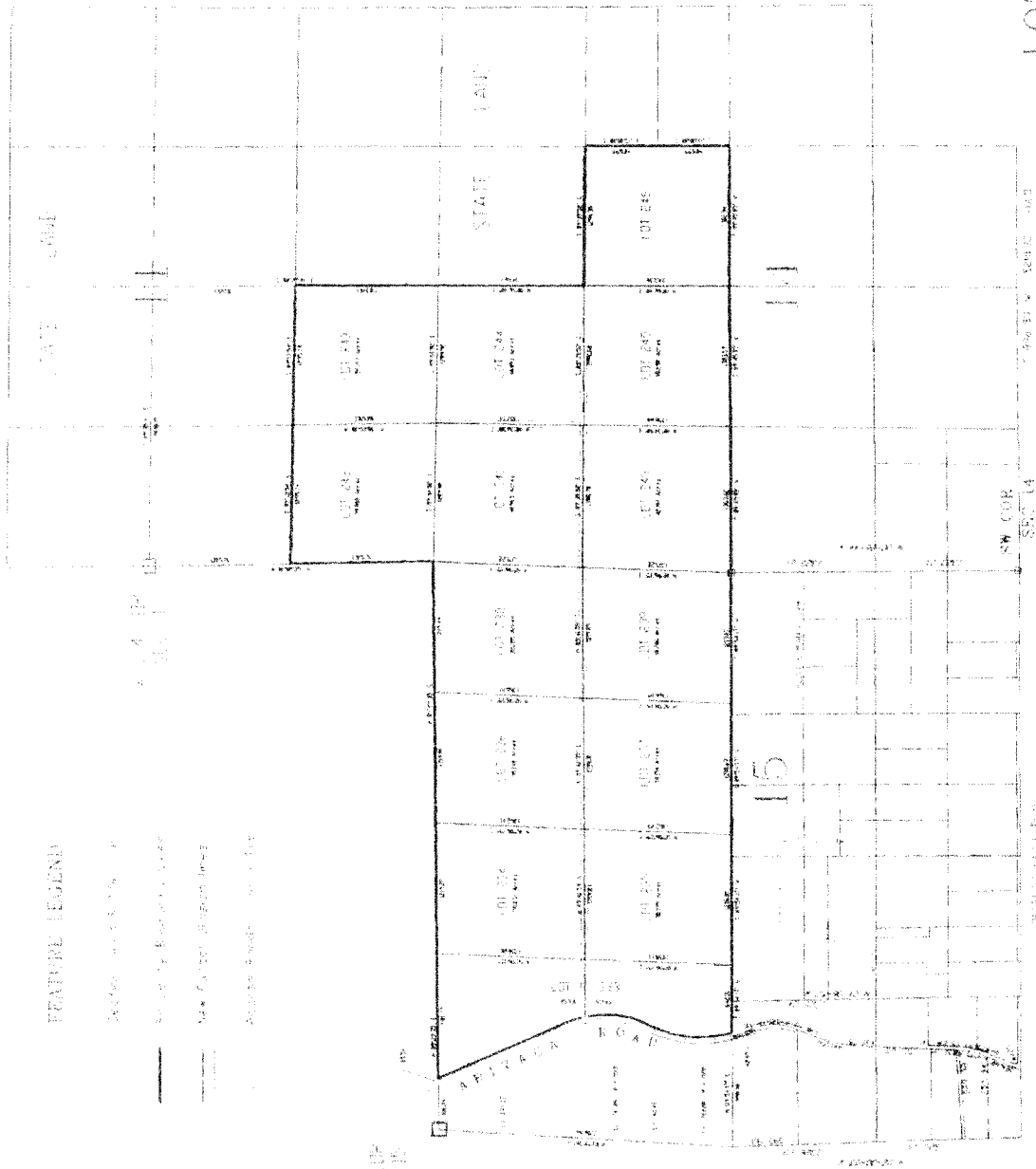
DON ZUCARELLI, PLS. ■■■ MIKE SCHERRER, PLS.
ZUCARELLI SCHERRER ASSOCIATES
2419 E. 24TH STREET, TUCSON, ARIZONA 85713
(520) 824-5952 (502) 416-7993 mcs@zsaol.com



FEATURE LEGEND

- Section boundary line
- Survey boundary line
- Survey boundary line
- Survey boundary line

IN TOP
OF
PAGE



LOCATION MAP 1" = MILE

Portions of Sections

11, 14, & 15

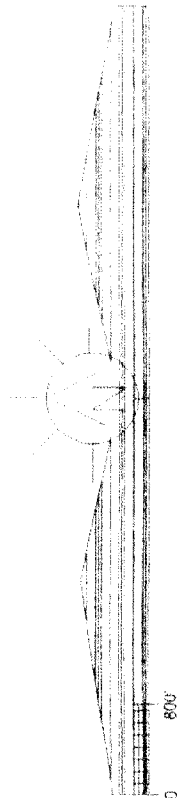
Township 21 South, Range 10 East,

G & S. R. M. Pima County, Arizona.

LOTS 233 THRU 246



DEN ZUCARELLI, P.E. MRS. SCHERRER, PLS.
ZUCARELLI SCHERRER ASSOCIATES
2419 E. 24th STREET, TUCSON, ARIZONA 85710
(520) 528-0655 (520) 528-7557



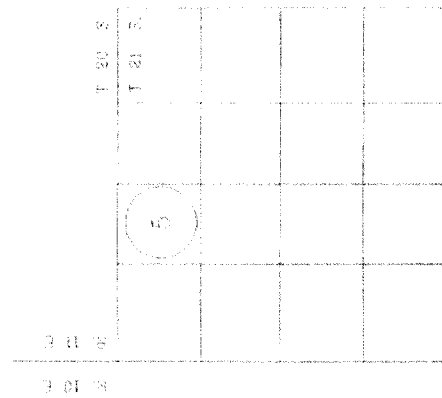
LINE	BEARING	DISTANCE
1	N 89°42'08" E	476.25
2	EAST	303.03
3	N 01°02'17" E	91.92
4	S 20°24'21" E	122.25
5	S 05°01'50" E	63.12
6	N 02°52'50" E	83.65
7	EAST	42.57
8	N 79°42'11" E	105.23
9	S 69°13'57" E	233.62
10	S 30°16'49" E	21.70



FEATURE LEGEND

- Section Lines & 1/4 Lines
- Property Boundary Lines
- New Parcel Division Lines
- Access Roads (30' x 12')

FOR ZUCARELLI, PLS. SEE MINI SCHERRER, TUS.
 ZUCARELLI SCHERRER ASSOCIATES
 2412 E 24th STREET, TUCSON, ARIZONA 85713
 (520) 824-5652 (502) 616-7453 msa@zsaot.com



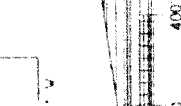
LOCATION MAP 1" = MILE

Section 5

Township 21 South, Range 11 East,
 G. & S. R. M., Pima County, Arizona



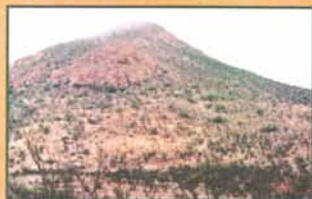
LOTS 247 THRU 251



ACREAGE	SECTION	SECTION	SECTION	SECTION
1.01	1.01	1.02	1.03	1.04
1.05	1.06	1.07	1.08	1.09
1.10	1.11	1.12	1.13	1.14
1.15	1.16	1.17	1.18	1.19
1.20	1.21	1.22	1.23	1.24
1.25	1.26	1.27	1.28	1.29
1.30	1.31	1.32	1.33	1.34
1.35	1.36	1.37	1.38	1.39
1.40	1.41	1.42	1.43	1.44
1.45	1.46	1.47	1.48	1.49
1.50	1.51	1.52	1.53	1.54
1.55	1.56	1.57	1.58	1.59
1.60	1.61	1.62	1.63	1.64
1.65	1.66	1.67	1.68	1.69
1.70	1.71	1.72	1.73	1.74
1.75	1.76	1.77	1.78	1.79
1.80	1.81	1.82	1.83	1.84
1.85	1.86	1.87	1.88	1.89
1.90	1.91	1.92	1.93	1.94
1.95	1.96	1.97	1.98	1.99
2.00	2.01	2.02	2.03	2.04
2.05	2.06	2.07	2.08	2.09
2.10	2.11	2.12	2.13	2.14
2.15	2.16	2.17	2.18	2.19
2.20	2.21	2.22	2.23	2.24
2.25	2.26	2.27	2.28	2.29
2.30	2.31	2.32	2.33	2.34
2.35	2.36	2.37	2.38	2.39
2.40	2.41	2.42	2.43	2.44
2.45	2.46	2.47	2.48	2.49
2.50	2.51	2.52	2.53	2.54
2.55	2.56	2.57	2.58	2.59
2.60	2.61	2.62	2.63	2.64
2.65	2.66	2.67	2.68	2.69
2.70	2.71	2.72	2.73	2.74
2.75	2.76	2.77	2.78	2.79
2.80	2.81	2.82	2.83	2.84
2.85	2.86	2.87	2.88	2.89
2.90	2.91	2.92	2.93	2.94
2.95	2.96	2.97	2.98	2.99
3.00	3.01	3.02	3.03	3.04
3.05	3.06	3.07	3.08	3.09
3.10	3.11	3.12	3.13	3.14
3.15	3.16	3.17	3.18	3.19
3.20	3.21	3.22	3.23	3.24
3.25	3.26	3.27	3.28	3.29
3.30	3.31	3.32	3.33	3.34
3.35	3.36	3.37	3.38	3.39
3.40	3.41	3.42	3.43	3.44
3.45	3.46	3.47	3.48	3.49
3.50	3.51	3.52	3.53	3.54
3.55	3.56	3.57	3.58	3.59
3.60	3.61	3.62	3.63	3.64
3.65	3.66	3.67	3.68	3.69
3.70	3.71	3.72	3.73	3.74
3.75	3.76	3.77	3.78	3.79
3.80	3.81	3.82	3.83	3.84
3.85	3.86	3.87	3.88	3.89
3.90	3.91	3.92	3.93	3.94
3.95	3.96	3.97	3.98	3.99
4.00	4.01	4.02	4.03	4.04
4.05	4.06	4.07	4.08	4.09
4.10	4.11	4.12	4.13	4.14
4.15	4.16	4.17	4.18	4.19
4.20	4.21	4.22	4.23	4.24
4.25	4.26	4.27	4.28	4.29
4.30	4.31	4.32	4.33	4.34
4.35	4.36	4.37	4.38	4.39
4.40	4.41	4.42	4.43	4.44
4.45	4.46	4.47	4.48	4.49
4.50	4.51	4.52	4.53	4.54
4.55	4.56	4.57	4.58	4.59
4.60	4.61	4.62	4.63	4.64
4.65	4.66	4.67	4.68	4.69
4.70	4.71	4.72	4.73	4.74
4.75	4.76	4.77	4.78	4.79
4.80	4.81	4.82	4.83	4.84
4.85	4.86	4.87	4.88	4.89
4.90	4.91	4.92	4.93	4.94
4.95	4.96	4.97	4.98	4.99
5.00	5.01	5.02	5.03	5.04
5.05	5.06	5.07	5.08	5.09
5.10	5.11	5.12	5.13	5.14
5.15	5.16	5.17	5.18	5.19
5.20	5.21	5.22	5.23	5.24
5.25	5.26	5.27	5.28	5.29
5.30	5.31	5.32	5.33	5.34
5.35	5.36	5.37	5.38	5.39
5.40	5.41	5.42	5.43	5.44
5.45	5.46	5.47	5.48	5.49
5.50	5.51	5.52	5.53	5.54
5.55	5.56	5.57	5.58	5.59
5.60	5.61	5.62	5.63	5.64
5.65	5.66	5.67	5.68	5.69
5.70	5.71	5.72	5.73	5.74
5.75	5.76	5.77	5.78	5.79
5.80	5.81	5.82	5.83	5.84
5.85	5.86	5.87	5.88	5.89
5.90	5.91	5.92	5.93	5.94
5.95	5.96	5.97	5.98	5.99
6.00	6.01	6.02	6.03	6.04
6.05	6.06	6.07	6.08	6.09
6.10	6.11	6.12	6.13	6.14
6.15	6.16	6.17	6.18	6.19
6.20	6.21	6.22	6.23	6.24
6.25	6.26	6.27	6.28	6.29
6.30	6.31	6.32	6.33	6.34
6.35	6.36	6.37	6.38	6.39
6.40	6.41	6.42	6.43	6.44
6.45	6.46	6.47	6.48	6.49
6.50	6.51	6.52	6.53	6.54
6.55	6.56	6.57	6.58	6.59
6.60	6.61	6.62	6.63	6.64
6.65	6.66	6.67	6.68	6.69
6.70	6.71	6.72	6.73	6.74
6.75	6.76	6.77	6.78	6.79
6.80	6.81	6.82	6.83	6.84
6.85	6.86	6.87	6.88	6.89
6.90	6.91	6.92	6.93	6.94
6.95	6.96	6.97	6.98	6.99
7.00	7.01	7.02	7.03	7.04
7.05	7.06	7.07	7.08	7.09
7.10	7.11	7.12	7.13	7.14
7.15	7.16	7.17	7.18	7.19
7.20	7.21	7.22	7.23	7.24
7.25	7.26	7.27	7.28	7.29
7.30	7.31	7.32	7.33	7.34
7.35	7.36	7.37	7.38	7.39
7.40	7.41	7.42	7.43	7.44
7.45	7.46	7.47	7.48	7.49
7.50	7.51	7.52	7.53	7.54
7.55	7.56	7.57	7.58	7.59
7.60	7.61	7.62	7.63	7.64
7.65	7.66	7.67	7.68	7.69
7.70	7.71	7.72	7.73	7.74
7.75	7.76	7.77	7.78	7.79
7.80	7.81	7.82	7.83	7.84
7.85	7.86	7.87	7.88	7.89
7.90	7.91	7.92	7.93	7.94
7.95	7.96	7.97	7.98	7.99
8.00	8.01	8.02	8.03	8.04
8.05	8.06	8.07	8.08	8.09
8.10	8.11	8.12	8.13	8.14
8.15	8.16	8.17	8.18	8.19
8.20	8.21	8.22	8.23	8.24
8.25	8.26	8.27	8.28	8.29
8.30	8.31	8.32	8.33	8.34
8.35	8.36	8.37	8.38	8.39
8.40	8.41	8.42	8.43	8.44
8.45	8.46	8.47	8.48	8.49
8.50	8.51	8.52	8.53	8.54
8.55	8.56	8.57	8.58	8.59
8.60	8.61	8.62	8.63	8.64
8.65	8.66	8.67	8.68	8.69
8.70	8.71	8.72	8.73	8.74
8.75	8.76	8.77	8.78	8.79
8.80	8.81	8.82	8.83	8.84
8.85	8.86	8.87	8.88	8.89
8.90	8.91	8.92	8.93	8.94
8.95	8.96	8.97	8.98	8.99
9.00	9.01	9.02	9.03	9.04
9.05	9.06	9.07	9.08	9.09
9.10	9.11	9.12	9.13	9.14
9.15	9.16	9.17	9.18	9.19
9.20	9.21	9.22	9.23	9.24
9.25	9.26	9.27	9.28	9.29
9.30	9.31	9.32	9.33	9.34
9.35	9.36	9.37	9.38	9.39
9.40	9.41	9.42	9.43	9.44
9.45	9.46	9.47	9.48	9.49
9.50	9.51	9.52	9.53	9.54
9.55	9.56	9.57	9.58	9.59
9.60	9.61	9.62	9.63	9.64
9.65	9.66	9.67	9.68	9.69
9.70	9.71	9.72	9.73	9.74
9.75	9.76	9.77	9.78	9.79
9.80	9.81	9.82	9.83	9.84
9.85	9.86	9.87	9.88	9.89
9.90	9.91	9.92	9.93	9.94
9.95	9.96	9.97	9.98	9.99
10.00	10.01	10.02	10.03	10.04
10.05	10.06	10.07	10.08	10.09
10.10	10.11	10.12	10.13	10.14
10.15	10.16	10.17	10.18	10.19
10.20	10.21	10.22	10.23	10.24
10.25	10.26	10.27	10.28	10.29
10.30	10.31	10.32	10.33	10.34
10.35	10.36	10.37	10.38	10.39
10.40	10.41	10.42	10.43	10.44
10.45	10.46	10.47	10.48	10.49
10.50	10.51	10.52	10.53	10.54
10.55	10.56	10.57	10.58	10.59
10.60	10.61	10.62	10.63	10.64
10.65	10.66	10.67	10.68	10.69
10.70	10.71	10.72	10.73	10.74
10.75	10.76	10.77	10.78	10.79
10.80	10.81	10.82	10.83	10.84
10.85	10.86	10.87	10.88	10.89
10.90	10.91	10.92	10.93	10.94
10.95	10.96	10.97	10.98	10.99
11.00	11.01	11.02	11.03	11.04
11.05	11.06	11.07	11.08	11.09
11.10	11.11	11.12	11.13	11.14
11.15	11.16	11.17	11.18	11.19
11.20	11.21	11.22	11.23	11.24
11.25	11.26	11.27	11.28	11.29
11.30	11.31	11.32	11.33	11.34
11.35	11.36	11.37	11.38	11.39
11.40	11.41	11.42	11.43	11.44
11.45	11.46	11.47	11.48	11.49
11.50	11.51	11.52	11.53	11.54
11.55	11.56	11.57	11.58	11.59
11.60	11.61	11.62	11.63	11.64
11.65	11.66	11.67	11.68	11.69
11.70	11.71	11.72	11.73	11.74
11.75	11.76	11.77	11.78	11.79
11.80	11.81	11.82	11.83	11.84
11.85	11.86	11.87	11.88	11.89
11.90	11.91	11.92	11.93	11.94
11.95	11.96	11.97	11.98	11.99
12.00	12.01	12.02	12.03	12.04
12.05	12.06	12.07	12.08	12.09
12.10	12.11	12.12	12.13	12.14
12.15	12.16	12.17	12.18	12.19
12.20	12.21	12.22	12.23	12.24
12.25	12.26	12.27	12.28	12.29
12.30	12.31	12.32	12.33	12.34
12.35	12.36	12.37	12.38	12.39
12.40	12.41	12.42	12.43	12.44
12.45	12.46	12.47	12.48	12.49
12.50	12.51	12.52	12.53	12.54
12.55	12.56	12.57	12.58	12.59
12.60	12.61	12.62	12.63	12.64
12.65	12.66	12.67	12.68	12.69
12.70	12.71	12.72	12.73	12.74
12.75	12.76	12.77	12.78	12.79
12.80	12.81	12.82	12.83	12.84
12.85	12.86	12.87	12.88	12.89
12.90	12.91	12.92	12.93	12.94
12.95	12.96	12.97	12.98	12.99
13.00	13.01	13.02	13.03	13.04
13.05	13.06	13.07	13.08	13.09
13.10	13.11	13.12	13.13	13.14
13.15	13.16</			

Attachment 6: Biological Assessment

BIOLOGICAL RECONNAISSANCE OF RANCHO SECO



PREPARED FOR:

Pima County Administrator's Office
130 West Congress, 10th Floor
Tucson, Arizona 85701

PREPARED BY:



Environmental Planning Group
330 East 13th Street
Tucson, Arizona 85701

January 2005

TABLE OF CONTENTS

Introduction	1
Topography and Landform.....	2
Existing Environment.....	7
Vegetation and Range	7
Wildlife Species	12
Birds	16
Priority Vulnerable Species and Special Elements	23
Mammals	25
Birds	29
Amphibians and Reptiles	34
Plants	37
Special Elements	39
Existing Disturbance and Evidence of Human Activity	40
Conclusions and Recommendations.....	40
References Cited	44
Appendix A	47

LIST OF PHOTOGRAPHS

1	Looking east over gently rolling terrain with mesquite-grassland on the road to Montaña Ranch	4
2	Looking northeast over rolling terrain with the Las Guijas Mountains in the background	4
3	Cerro Colorado, just southwest of the Cerro Colorado Mountains.....	5
4	The Cerro Colorado Mountains from the Rancho Seco Road	5
5	Looking upstream on Sopori Wash from the driveway to Rancho Santa Lucia	6
6	Looking upstream on Calera Wash in the vicinity of the Montaña Ranch headquarters	6
7	Mesquite-grassland near Cerro Colorado. The center-foreground shrubs are snakeweed as are all the straw-colored shrubs on the far hillside.....	8
8	Mesquite-grassland at Rancho Cordova. The foreground sub-shrubs are all snakeweed and burroweed	8
9	Dense growth of ocotillo on a limestone hillside near Fernstrom Tank northwest of the Montaña Ranch headquarters.....	9
10	Dense ocotillo on a small limestone hillside just north of the Cerro Colorado Mine	9
11	Cottonwood trees along Las Guijas Wash near the Montaña Ranch headquarters. The shrubby plants in the right corner are seepwillows flanked by mesquite	10
12	Velvet ash tree on Las Guijas Wash near the Montaña Ranch headquarters. Plants to the right are seepwillows with <i>Hymenoclea monogyra</i> in the center background	10
13	A small group of cattle at a windmill just east of the Rancho Seco headquarters	11
14	Mesquite grassland near Montaña Ranch. The common foreground shrubs in this photo are all snakeweed. Note the relative absence of grasses	11
15	The Rancho Seco headquarters and vehicle storage facilities.....	41
16	A windmill and water tank on Calera Wash. Though not clearly visible in the photo, there is a small adobe building behind and to the right of the tank.....	41
17	The Montaña Ranch headquarters surrounded by livestock fencing	42
18	The Cerro Colorado Mine	42
19	An abandoned pick-up truck on Calera Wash just northwest of the Arivaca Road..	43

LIST OF FIGURES

1	3
---	-------	---

LIST OF TABLES

1	Exotic Plant Species Thought Likely to Occur at Rancho Seco	12
2	Mammalian Species That Could Potentially be Present on the Rancho Seco Property	13
3	Bird Species That Are Likely to be Present at Rancho Seco	16
4	Amphibian and Reptile Species That are Likely to be Present at Rancho Seco	20
5	Priority Vulnerable Species with Modeled High or Moderate Habitat, Priority Conservation Area (PCA) Status, and an Estimate of Probability of Occurrence for Each at Rancho Seco	24

BIOLOGICAL RECONNAISSANCE OF RANCHO SECO PIMA COUNTY, ARIZONA

INTRODUCTION

The goal of the Sonoran Desert Conservation Plan (SDCP) as stated by the Science Technical Advisory Team (STAT) is:

- To ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County through maintaining or improving the habitat conditions and ecosystem functions necessary for their survival

In moving to accomplish this goal, Pima County has developed an ecosystem-based Conservation Lands System (CLS) (Pima County 2002a), which identifies those areas in Pima County that must be preserved or minimally encroached in order to achieve the stated goal of the SDCP. The CLS identifies Important Riparian Areas, as “extremely important elements in the CLS and every effort should be made to protect, restore, and enhance the structure and functions of these areas, including hydrological, geomorphic, and biological functions.” Urban development guidelines recommend that 95 percent of the natural resources of Important Riparian Areas be retained, including all riparian linkage areas and all washes with a discharge value of 250 cubic feet per second or larger regardless of whether such wash is located within or outside the biological reserve boundaries.”

In addition to important riparian areas, the CLS also identifies Biological Core, Scientific Research Management, and Multiple Use or Recovery Management Areas. Biological Core Areas are defined as “areas of very high biological importance distinguished by high potential habitat for five or more priority vulnerable species, special elements, and other unique biological features.” Development guidelines in Biological Core Areas recommend retention of 80 percent of biological resources and land use should achieve actual conservation of the species that occupy the landscape. Scientific Research Areas include the Santa Rita Experimental Range and the Desert Laboratory at Tumamoc Hill. Land uses in these areas focus on balancing conservation, restoration, and enhancement of natural communities in support of scientific research on environmental and natural processes. There are no development guidelines for Scientific Research Areas. The CLS also identifies Multiple Use Management Areas as areas with “high potential habitat for three or more Priority Vulnerable Species and special elements.” Special elements include caves, perennial streams, cottonwood-willow forests, and other unique biological features. Land use and management goals within Multiple Use Management Areas focus on balancing conservation, restoration, and enhancement of natural communities with other uses that are compatible with the maintenance of biological values. Land uses appropriate for these areas must be consistent with maintaining open space, natural vegetation, and wildlife habitat values (Pima County 2004). Urban development guidelines within Multiple Use Management Areas suggest maintenance of 60 to 75 percent of the biological resources.

This report provides a brief biological evaluation of Rancho Seco (Figure 1 – Rancho Seco Location Map) located just north of the village of Arivaca. Most of the Rancho Seco lands are classified in the CLS as Multiple Use or Recovery Management Areas. However, portions are classified as Biological Core as on Soporí Wash and in the extreme western reaches of the property where it abuts the Buenos Aires National Wildlife Refuge (Pima County 2002a). Important riparian areas are located on Soporí Wash and on the Las Guijas/Calera Wash complex.

Plant community, vegetation, and wildlife observations reported herein were made during site visits on 17 September 2002 and 21 January 2005.

TOPOGRAPHY AND LANDFORM

Elevations at Rancho Seco range from approximately 3,400 feet asl in Sheriff's Draw at the far eastern edge of the property to nearly 5,300 feet asl in the Cerro Colorado Mountains. The entire property is topographically varied with some areas of relatively flat to gently rolling land as on Sheriff's Mesa and in the interior of the property east of Montañó Ranch (Photographs 1 and 2) giving way to the steep, rugged topography of the Cerro Colorado Mountains (Photographs 3 and 4). Several significant washes drain the property including Soporí, Las Guijas, Calera, Pesquiera, Bolos Blancos, Canez, Cerro Colorado, and Colorado Washes and Arroyo Seco (Photographs 5 and 6). In the western half of Rancho Seco, drainage is to the northwest and in the eastern half it is generally to the east or southeast. The largest wash on the property, Soporí Wash, flows to the northeast.

Geology of the Rancho Seco area is primarily volcanic and fairly complex. The Cerro Colorado Mountains are composed of dikes and plugs that are rhyolitic to basaltic with outcrops of rhyolite, andesite, and basalt. Cerro Colorado is a diorite porphyry feature (see Photograph 3). There is a small limestone-dominated area on the northeast side of Cerro Colorado. Most of the lands between the Cerro Colorado Mountains and the Las Guijas Mountains are dominated by andesite with some areas of silt, sand, and gravel deposition. The Las Guijas Mountains are mostly granite and volcanic rocks with some fairly extensive areas of limestone just to the northeast and east of the range (Arizona Bureau of Mines 1960).

Thermic semiarid soils characterize all of the Rancho Seco lands. Three different soil types are present (Hendricks 1985):

Tubac-Grabe-Sonoita Association: Deep, moderately coarse to fine-textured nearly level to strongly sloping soils of the uplands and drainage ways.

Caralampi-Hathaway Association: Deep, gravelly, moderately coarse to moderately fine-textured, moderately steep to very steep soils on highly dissected old fan surfaces.



Photo 1. Looking east over gently rolling terrain with mesquite-grassland on the road to Montaña Ranch.



Photo 2. Looking northeast over rolling terrain with the Las Guijas Mountains in the background.



Photo 3. Cerro Colorado, just southwest of the Cerro Colorado Mountains.



Photo 4. The Cerro Colorado Mountains from the Rancho Seco road.



Photo 5. Looking upstream on Sopori Wash from the driveway to Rancho Santa Lucia.



Photo 6. Looking upstream on Calera Wash in the vicinity of the Montaña Ranch headquarters.

Lithic Torriorthents-Lithic Haplustolls-Rock Outcrop Association: Shallow cobbly and gravelly, strongly sloping to very steep soils and rock outcrops on hills and mountains.

EXISTING ENVIRONMENT

Vegetation and Range

The vast majority of Rancho Seco can be classified as semidesert grassland in the sense of Brown (1994) or Apacherian mixed shrub in the sense of Burgess (1995). Interfluvial sites are dominated by low- to mid-sized velvet mesquite (*Prosopis velutina*) with ground cover of the semi-shrubs snakeweed (*Gutierrezia sarothrae*) and/or burroweed (*Isocoma tenuisecta*) and grasses (Photographs 7 and 8). Other semi-shrubs and shrubs that occur sparingly include fairy duster (*Calliandra eriophylla*), whitethorn (*Acacia constricta*), desert broom (*Baccharis sarothroides*), and wolfberry (*Lycium* sp.). Warnock's snakewood (*Condalia warnockii*) is a locally conspicuous, large shrub, especially in the Las Guijas Mountains northwest of Montaña Ranch. Other species that are common on interfluvial sites are barrel cactus (*Ferocactus wislizenii*), prickly pear (*Opuntia phaeacantha*), cholla (*Opuntia* cf. *fulgida*), soaptree yucca (*Yucca elata*), and ocotillo (*Fouquieria splendens*). Ocotillo is locally abundant on limestone hillsides (Photographs 9 and 10). Generally, grasses are fairly sparse with Lehman lovegrass (*Eragrostis lehmanniana*) perhaps the most common species present. Plains lovegrass (*Eragrostis intermedia*), sideoats grama (*Bouteloua curtipendula*), and dropseed (*Sporobolus* sp.) are also present.

Mesquite is also the most common species along most washes at Rancho Seco, but individual plants tend to be larger. In addition to mesquite, larger washes such as Las Guijas and Calera also support individual trees of canyon hackberry (*Celtis reticulata*) and in the vicinity of the Montaña Ranch, there are individuals of cottonwood (*Populus fremontii*) and velvet ash (*Fraxinus velutina*) (Photographs 9-12). Occurring with cottonwood and velvet ash is seepwillow (*Baccharis salicifolia*) and burro brush (*Hymenoclea monogyra*). With the exception of *Hymenoclea* all of these plants are facultative wetland indicator species at the national level. Facultative wetland species are species that occur in wetlands 67 to 99 percent of the time. Their presence in the vicinity of Montaña Ranch suggests an area of shallow ground water.

Desert mistletoe (*Phoradendron californicum*) is fairly common in mesquites on upland sites while the much larger leaved *Phoradendron flavescens* is fairly common on canyon hackberry and cottonwood on Las Guijas Wash.

Clearly, the lands included within the boundaries of Rancho Seco have had a primary past history of cattle grazing, which continues today (Photograph 13). It is believed that grazing since the 1870s has led to soil erosion, destruction of those plants most palatable to livestock, changes in grassland fire ecology, the spread of non-native plants, and a steady increase in the density of woody shrubs and brush (Behr 1995). The pre-settlement condition of Rancho Seco is unknown,



Photo 7. Mesquite-grassland near Cerro Colorado. The center-foreground shrubs are snakeweed as are all the straw-colored shrubs on the far hillside.



Photo 8. Mesquite-grassland at Rancho Cordova. The foreground sub-shrubs are all snakeweed and burroweed.



Photo 9. Dense growth of ocotillo on a limestone hillside near Fernstrom Tank northwest of the Montaña Ranch headquarters.



Photo 10. Dense ocotillo on a small limestone hillside just north of the Cerro Colorado Mine.



Photo 11. Cottonwood trees along Las Guijas Wash near the Montaña Ranch headquarters. The shrubby plants in the right corner are seepwillows flanked by mesquite.



Photo 12. Velvet ash tree on Las Guijas Wash near the Montaña Ranch headquarters. Plants to the right are seepwillows with *Hymenoclea monogyra* in the center background.



Photo 13. A small group of cattle at a windmill just east of the Rancho Seco headquarters.



Photo 14. Mesquite grassland near Montaña Ranch. The common foreground shrubs in this photo are all snakeweed. Note the relative absence of grasses.

but it is likely there has been an increase in woody species and a decrease in native palatable grasses. Perhaps the abundance of the two native sub-shrubs *Gutierrezia sarothrae* and *Isocoma tenuisecta* is an indication of previous invasion and increase of woody species into former grassland habitats. Both species are often cited as evidence of previous over-grazing and both are quite abundant at Rancho Seco (Photograph 14).

The only exotic plant species observed at Rancho Seco in January 2005 was Lehmann lovegrass. It is, however, highly likely that other species including those listed in Table 1 are also present.

<p align="center">TABLE 1 EXOTIC PLANT SPECIES THOUGHT LIKELY TO OCCUR AT RANCHO SECO</p>	
<u>Scientific Name</u>	<u>Common Name</u>
<i>Amaranthus albus</i>	White Pigweed
<i>Avena fatua</i>	Wild Oat
<i>Bromus rubens</i>	Red Brome
<i>Centaurea solstitialis</i> ¹	Yellow Star Thistle
<i>Cynodon dactylon</i>	Bermuda Grass
<i>Eragrostis lehmanniana</i>	Lehmann Lovegrass
<i>Erodium cicutarium</i>	Filaree
<i>Helianthus annuus</i>	Annual Sunflower
<i>Parkinsonia aculeata</i>	Mexican Palo Verde
<i>Portulaca oleracea</i>	Common Purslane
<i>Rumex crispus</i>	Curly Dock
<i>Salsola iberica</i>	Russian Thistle
<i>Sisymbrium irio</i>	London Rocket
¹ Species is also on the Arizona noxious weed list.	

Wildlife Species

Mammals

The mammalian fauna of Rancho Seco is dominated by small, mostly nocturnal species of bats (14 Species) and rodents (13 species). Other forms include insectivores (1 species), lagomorphs (3 species), carnivores (8 species) and ungulates (2 species). Table 2 is an inventory of the mammalian species thought most likely to be present at Rancho Seco.

Rancho Seco has 10 named mines and numerous shafts and prospects, some of which are likely to provide roost sites to several species of the bats listed in Table 2. The nectivorous species, Lesser Long-nosed Bat and Mexican Long-tongued Bat are likely to occur only rarely and then probably only as transient migratory species owing to a lack of foraging substrate. There are no saguaros and, apparently, no paniculate agaves that could be used by these bats for foraging. The insectivorous species have extensive mesquite grassland, mesquite riparian and a number of fairly large stock tanks over which to forage and obtain water.

Harris' Antelope Squirrel, Rock Squirrel and Botta's Pocket Gopher are the only rodents listed in Table 2 that are diurnal. Botta's Pocket Gopher is active during the daylight hours, but they are

fossorial (burrowing underground) and seldom seen on the surface. The Heteromyid rodents (kangaroo rats and pocket mice) in Table 2 are highly adapted to life in arid environments. Fur-lined cheek pouches allow them to transport dry seeds without losing valuable salivary moisture and they have such a finely tuned renal (kidney) system that they can survive on metabolic water. In laboratory situations in the absence of heat stress, heteromyids can survive indefinitely on a diet of dried seeds.

Among the species of carnivores at Rancho Seco, the Coyote is certainly the most common. Mountain lions probably occupy the more rugged terrain of the Cerro Colorado and Las Guijas Mountains. The three skunk species are probably uncommon to rare but any one of the three may be encountered around old buildings and stock tanks. Badgers are generally uncommon animals whose presence is dependent upon friable soils for burrows and an adequate prey base of rodents and rabbits.

TABLE 2
MAMMALIAN SPECIES THAT COULD POTENTIALLY BE PRESENT ON
THE RANCHO SECO PROPERTY

Common Name	Scientific Name	Habitat	Probability of Presence
Desert shrew	<i>Notiosorex crawfordi</i>	Any arid habitat with ample cover – dead agave plants, under piles of lumber, etc., in oak belt, among junipers, desertscrub, and riparian	L
California leaf-nosed bat	<i>Macrotus californicus</i>	Primarily cave and mine dwellers in AZ, mostly in Sonoran desertscrub	M
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>	During summer over desert grasslands and scrubland up to edge of oaks in southern AZ, forage in areas of saguaro, agave, ocotillo, palo verde, and prickly pear	L
Mexican Long-tongued Bat	<i>Choeronycteris mexicana</i>	Found in summer in mine tunnels, caves or rock fissures generally from the lower edge of oak woodland upslope to the pine-fir belt.	M
Cave myotis	<i>Myotis velifer</i>	Inhabit mine shafts, tunnels, caves (usually near entrance), even under bridges, in desert areas of creosote bush, palo verde, brittlebush, and cacti, never more than a few miles from water source – tanks, canals, or creeks	L
California myotis	<i>Myotis californicus</i>	Roost in crevices and cracks of canyon walls, sometimes in caves or mine shafts, forages over desertscrub to the oaks and along lower edge of the conifers	H
Western small-footed myotis	<i>Myotis leibii</i>	Roost in crevices and cavities of cliffs or rocks above hottest deserts, among oaks, over chaparral, in riparian situations with junipers and oaks, and in the lower edge of oak belt	L-M
Western pipistrelle	<i>Pipistrellus hesperus</i>	Hunt along canyons, stream beds, and water holes from desertscrub to pine forests, but never far from rocky canyon walls, cliffs, or rocky outcrops where they roost in narrow 1-inch vertical crevices	H
Big brown bat	<i>Eptesicus fuscus</i>	In wooded areas-deciduous and coniferous, also present in desertscrub	M
Townsend's big-	<i>Plecotus townsendii</i>	Found in day caves or mine tunnels, rest in	H

TABLE 2
MAMMALIAN SPECIES THAT COULD POTENTIALLY BE PRESENT ON
THE RANCHO SECO PROPERTY

Common Name	Scientific Name	Habitat	Probability of Presence
eared bat		abandoned buildings at night, in desert scrub, in shelters in desert mountains, oak woodland, piñon-juniper, coniferous forests	
Pallid bat	<i>Antrozous pallidus</i>	Desert scrub in attics of houses, roofs of barns and sheds, old mine tunnels, crevices in cliffs, undersides of bridges and many other shelters	M
American free-tailed bat	<i>Tadarida brasiliensis</i>	Caves and mines, sometimes old buildings or bridges, of desert scrub and foothills of some higher mountains	M
Pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	Rocky cliffs and slopes of southern deserts in Arizona, uses man-made shelters such as under roofing tiles on buildings	L
Big free-tailed bat	<i>Tadarida macrotis</i>	Variety of habitats: ponderosa pine, piñon-juniper, Douglas-fir, and Sonoran desert scrub, roost on rocky cliffs with crevices and fissures	L
Western mastiff bat	<i>Eumops perotis</i>	Roost in crevices and shallow caves on the sides of cliffs and rock walls	L
Desert cottontail	<i>Sylvilagus audubonii</i>	Desert scrub, including Great Basin desert scrub and plains- desert grasslands, may be found as high as junipers, in mountains in southeastern Arizona- may be found as high as oak belt	H
Antelope jack rabbit**	<i>Lepus alleni</i>	Mesquite grasslands, especially in areas where mesquite is dense and grasses sparing.	Present
Black-tailed jackrabbit	<i>Lepus californicus</i>	Open country, from deserts to open scrub forests, found in mesquite, sagebrush, desert scrub, into open piñon-juniper, grazed lands and croplands	L
Harris' antelope squirrel	<i>Ammospermophilus harrisi</i>	Saltbush-creosote bush-bursage deserts of western and southern Arizona, usually with rocky soil or rocky slopes	M
Rock squirrel	<i>Spermophilus variegatus</i>	In or among rocks, either on slopes, canyon walls, or rock piles in wide variety of habitats, 1,600-11,000 feet	H
Botta's pocket gopher**	<i>Thomomys bottae</i>	Underground burrows in nearly every habitat in Arizona as long as sufficient tuberous roots and plant material are available and soil is suitable for digging tunnels	Present
Arizona Pocket Mouse	<i>Perognathus amplus</i>	Flats with creosote bush, mesquite, palo verde, and cacti.	M
Bailey's pocket mouse	<i>Perognathus baileyi</i>	Flats and adjacent slopes of deserts south of Mogollon Rim	M
Ord's kangaroo rat	<i>Dipodomys ordii</i>	Variety of habitats: alluvial fans of southeastern mountains to sandy soils and sagebrush of Arizona Strip; in mesquite, cacti, and grasses of central and southern parts of the state to open piñon-juniper country of the north	L
Merriam's kangaroo	<i>Dipodomys merriami</i>	Sonoran and Chihuahuan desert scrub, closely	H

TABLE 2
MAMMALIAN SPECIES THAT COULD POTENTIALLY BE PRESENT ON
THE RANCHO SECO PROPERTY

Common Name	Scientific Name	Habitat	Probability of Presence
rat		associated with mesquite, creosote bush, and cacti, sandy soil, avoids desert pavement or soil with many rocks, presence of grass is essential (with open areas interspersed)	
Plains harvest mouse	<i>Reithrodontomys montanus</i>	Xeric conditions, often with mesquite, creosote bush, tumbleweeds, some grass and usually in chaparral or desertscrub	M
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Cool grassy meadows to dry tumbleweed and cocklebur fields, from weedy patches in coniferous forests to flats with cacti, mesquite, or sagebrush	L
Cactus mouse	<i>Peromyscus eremicus</i>	Desert-among cacti, creosote bush, wood piles, rocks and rocky slopes, chaparral, and sandy flats	H
Mesquite mouse	<i>Peromyscus merriami</i>	Heavy forest-like stands of mesquite, mesquite and saltbush bottoms	M
Southern grasshopper mouse	<i>Onychomys torridus</i>	Desertscrub in southern and western Arizona, to some extent in plains and desert grasslands in southeastern quarter, mesquite, cacti, and friable soil	M
White-throated wood rat	<i>Neotoma albigula</i>	Variety of habitats – usually below conifer belt, in piñon-juniper, extensive cholla or prickly pear	L
Coyote**	<i>Canis latrans</i>	Every habitat in Arizona, broken country interrupted by rocks, brush, clumps of piñon-juniper or other vegetation	Present
Gray fox	<i>Urocyon cinereoargenteus</i>	Open desertscrub, chaparral, and oak or piñon-juniper woodland, sometimes in ponderosa pine or Douglas-fir	L
Badger	<i>Taxidea taxus</i>	Flats and alluvial fans adjacent to desert mountains, open desert, throughout most of Arizona	L
Spotted Skunk	<i>Spilogale putorius</i>	Poorly known, most specimens are from Arizona Upland Subdivision habitats, rocky areas	L
Hog-nosed skunk	<i>Conepatus mesoleucus</i>	A variety of habitats from desert grassland upslope into coniferous forest	M
Hooded Skunk	<i>Mephitis macroura</i>	Poorly known, most specimens are from the Arizona Upland Subdivision and grasslands. Seem to prefer rocky slopes, arroyos, and cliff bases	L
Mountain Lion	<i>Puma concolor</i>	Throughout Arizona in rugged mountainous terrain with good numbers of deer, the primary prey species	M
Bobcat	<i>Felis rufus</i>	Broken country with cliffs and rock outcrops interspersed with open grassland, woods, or desert, from base to tops of most desert ranges in mesquite woods, arrowweed thickets along Colorado River, juniper woodland, oak-manzanita to ponderosa pine	M
Collared peccary	<i>Pecari tajacu</i>	Desertscrub that is fairly thick and tall, especially in thickets along creeks and old steam beds within desertscrub, retreat in caves, mine shafts, or crevices on rocky slopes, 2000-6500 ft.	M
Mule deer	<i>Odocoileus hemionus</i>	Present in a variety of habitats– chaparral, desert washes and foothills, riparian woodlands	H

TABLE 2
MAMMALIAN SPECIES THAT COULD POTENTIALLY BE PRESENT ON
THE RANCHO SECO PROPERTY

Common Name	Scientific Name	Habitat	Probability of Presence
-------------	-----------------	---------	-------------------------

Source: Hoffmeister 1986

**Species or sign thereof observed during site reconnaissance on 21 January 2005.

Birds

Only 11 species of birds were observed at Rancho Seco on 21 January 2005, probably because of the foul weather on that day. Table 3 is an inventory of bird species that are thought most likely to occur there over the course of a year. Of the more than 75 species listing in Table 3, many are only likely to be present at Rancho Seco during periods of spring or fall migration. Others are present only during the spring and summer breeding season while still others are only present during the non-breeding winter season. Of the species listed in Table 3, about 30 of them are permanent residents.

TABLE 3
BIRD SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO

Common Name	Scientific Name	Habitat	Probability of Presence/Status
Turkey Vulture	<i>Cathartes aura</i>	Open country near wooded areas or cliffs suitable for nesting	C/S
Northern Harrier	<i>Circus cyaneus</i>	Grasslands	R/W
Golden Eagle	<i>Aquila chrysaetos</i>	Open country, desert and barren areas, especially in hilly terrain	R/R
Cooper's Hawk	<i>Accipiter cooperii</i>	Mature forest or broken woodlands, riparian forest, and in more open country	U/R
Harris's Hawk	<i>Parabuteo unicinctus</i>	Arid lowland or montane scrub	U/R
Zone-tailed Hawk	<i>Buteo albonotatus</i>	Wide variety of elevations and habitats, including gallery forest	R/S
Swainson's Hawk	<i>Buteo swainsoni</i>	Primarily semidesert grassland, often intermixed with desertscrub	U/ T
Red-tailed Hawk**	<i>Buteo jamaicensis</i>	Present in a wide variety of open country with scattered trees	C/R
American Kestrel **	<i>Falco sparverius</i>	Open and partly open country with scattered trees	UR
Merlin	<i>Falco columbarius</i>	Open to semi-open habitats, grasslands in winter	R/W
Prairie Falcon	<i>Falco mexicanus</i>	Desertscrub and dry grasslands	U/R
Scaled Quail	<i>Callipepla squamata</i>	Semidesert grassland and grassland	U/R
Gambel's Quail	<i>Callipepla gambelii</i>	Deserts with brush or low trees including xeroriparian habitat	C/R
Mourning Dove	<i>Zenaida macroura</i>	Arid and desert habitats near water	A/R
White-winged Dove	<i>Zenaida asiatica</i>	Saguaro-Palo verde desert and other arid lowland scrub and riparian thickets	U/S

TABLE 3 BIRD SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO			
Common Name	Scientific Name	Habitat	Probability of Presence/Status
Greater Roadrunner	<i>Geococcyx californianus</i>	Desert scrub and arid open areas with scattered vegetation	U/R
Barn Owl	<i>Tyto alba</i>	Open or partially open habitat, nests in caves, embankments, structures, and hollow trees	U/R
Great Horned Owl	<i>Bubo virginianus</i>	A variety of forested habitats, brushy hillsides, and semi-desert	U/R
Western Screech Owl	<i>Otus kennicottii</i>	Sonoran riparian deciduous forest of cottonwood and willow, and Sonoran desertscrub with saguaro and mesquite	U/R
Cactus Ferruginous Pygmy Owl	<i>Glaucidium brasilianum cactorum</i>	Streamside cottonwood and willows, or adjacent mesquite bosque, usually in the presence of saguaros on adjacent desert slopes	R/T
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	Desert, scrubland, and dry open country	U/S
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	Semi-arid and arid habitats among scrub, brush, or in open prairie	U/S
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	Arid open woodland, scrub, and desert washes	U/S
Rufous Hummingbird	<i>Selasphorus rufus</i>	Coniferous forest and brushy hillsides, in lowlands in spring migration	U/T
Gila Woodpecker**	<i>Melanerpes uropygialis</i>	Arid lowland scrub and cactus deserts	C/R
Northern Flicker **	<i>Colaptes auratus</i>	Desertscrub, semidesert grassland	U/W
Ladder-backed Woodpecker **	<i>Picoides scalaris</i>	Arid lowland scrub, mesquite, and cactus habitats	U/R
Say's Phoebe	<i>Sayornis saya</i>	Arid scrub and desert, nests in structures and on cliffs	U/R
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Desert scrub, piñon-juniper, and riparian habitats	C/S
Western Kingbird	<i>Tyrannus verticalis</i>	Dry, open country with scattered trees	U/S
Loggerhead Shrike **	<i>Lanius ludovicianus</i>	Open country, desertscrub, always with hunting perches	U/R
Bell's Vireo	<i>Vireo bellii</i>	Dense shrubs and trees along desert washes	C/S
Plumbeous Vireo	<i>Vireo plumbeus</i>	Pine forest down to piñon-juniper, and riparian woodland	U/T
Cassin's Vireo	<i>Vireo cassinii</i>	Occurs in a variety of woodland habitats	U/W, T
Warbling Vireo	<i>Vireo gilvus</i>	Found in a variety of woodland habitats including riparian forest and thickets, primarily with cottonwood and willow	U/T
Gray Vireo	<i>Vireo vicinior</i>	Oak-juniper, piñon-juniper, and also desert and arid scrub	R/T

TABLE 3 BIRD SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO			
Common Name	Scientific Name	Habitat	Probability of Presence/Status
Common Raven	<i>Corvus corax</i>	Variety of habitats, but often in mountains or hilly areas	C/R
Purple Martin	<i>Progne subis</i>	Lowland desertscrub with saguaro cacti	R/S
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Open country, usually near water with bridges, culverts, or cliffs for nesting	U/T
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Open habitats with steep banks or road cuts	U/T
Verdin	<i>Auriparus flaviceps</i>	Arid lowland scrub, mesquite, and thorny shrub habitat	U/R
Bewick's Wren	<i>Thryomanes bewickii</i>	Brushy areas, thickets and scrub in open country	U/R
Cactus Wren	<i>Campylorhynchus brunneicapillus</i>	Arid lowland scrub and low hillsides, often among cactus	C/R
Ruby-crowned Kinglet	<i>Regulus calendula</i>	All classes of riparian woodlands upslope into the oak zone	C/W
Black-tailed Gnatcatcher	<i>Poliophtila melanura</i>	Arid lowland scrub, particularly along xeroriparian washes	U/R
Western Bluebird **	<i>Sialia mexicana</i>	Winter visitor in piñon-juniper, mesquite groves, and along desert washes	U/W
Mountain Bluebird	<i>Sialia currucoides</i>	Winter visitor to lowlands, desert, and grasslands	R/W
Hermit Thrush	<i>Catharus guttatus</i>	Winter visitor in riparian and brushy habitats	U/W
Northern Mockingbird **	<i>Mimus polyglottos</i>	Variety of open habitats from scattered brush and trees to scrub and thickets in semi-desert	C/R
Curve-billed Thrasher**	<i>Toxostoma curvirostre</i>	Arid lowland scrub, usually among dense vegetation, but also in desert grassland with few cacti	C/R
Phainopepla**	<i>Phainopepla nitens</i>	Desert washes with mesquite, juniper or oak, usually where mistletoe available	C/W
Orange-crowned Warbler	<i>Vermivora celata</i>	Dense thickets, brush fields, and forest edges	U/T
Lucy's Warbler	<i>Vermivora luciae</i>	Arid lowland scrub, primarily mesquite or mesquite-cottonwood along streams and washes	U/S
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Open coniferous or mixed coniferous-deciduous forest, low scrub, or weedy fields	C/T
Yellow Warbler	<i>Dendroica petechia</i>	Mesquite and riparian woodlands	C/T
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Shrubland, brushy undergrowth, piñon-juniper	R/T
Wilson's Warbler	<i>Wilsonia pusilla</i>	Riparian and mesquite woodlands during spring and fall migration	C/T

TABLE 3 BIRD SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO			
Common Name	Scientific Name	Habitat	Probability of Presence/Status
Western Tanager	<i>Piranga ludoviciana</i>	Riparian woodlands during spring and fall migration	C/T
Green-tailed Towhee	<i>Pipilo chlorurus</i>	Chaparral, brushy hillsides and riparian scrub	U/T
Canyon Towhee	<i>Pipilo fuscus</i>	Brushlands, arid scrub, mesquite and riparian thickets	U/R
Abert's Towhee	<i>Pipilo aberti</i>	Riparian thickets and arid lowland scrub	R/R
Spotted Towhee	<i>Pipilo maculatus</i>	Open woodland, brushy and riparian thickets	R/T
Rufous-winged Sparrow	<i>Aimophila carpalis</i>	Arid, usually grassy, lowland scrub	U/R
Chipping Sparrow	<i>Spizella passerina</i>	Semidesert grassland, scrub	C-A/W,T
Brewer's Sparrow	<i>Spizella breweri</i>	Brushy scrublands and desert	C-A/W,T
Vesper Sparrow	<i>Poocetes gramineus</i>	Dry shrublands, weedy pastures, fields and arid scrub	U/W,T
Lark Sparrow	<i>Chondestes grammacus</i>	Brushy desertscrub and riparian edges	C/W
Black-throated Sparrow	<i>Amphispiza bilineata</i>	Desert scrub, thorny brush, mesquite, and juniper	C/R
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Low trees and shrubs, thickets, and brushy desert areas	C/W, T
Northern Cardinal	<i>Cardinalis cardinalis</i>	Scrub and riparian woodland, thickets and forest edges	U/R
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	Arid lowland scrub and riparian thickets	U/R
Blue Grosbeak	<i>Guiraca caerulea</i>	Riparian thickets, brushy or weedy areas	R/S
Brown-headed Cowbird	<i>Molothrus ater</i>	Woodland, forest, and forest edge; also open situations and scrub during winter and migration	C/R
Bronzed Cowbird	<i>Molothrus aeneus</i>	Second growth scrub, and brushy areas in open country	R/S
Hooded Oriole	<i>Icterus cucullatus</i>	Riparian woodland, mesquite, and arid country	U/S
Bullock's Oriole	<i>Icterus bullockii</i>	Open and fragmented woodlands of cottonwoods and willows	U/T
House Finch	<i>Carpodacus mexicanus</i>	Scrub and brush in semi-arid lowlands and slopes	U/R
** Species observed during site reconnaissance on 21 January 2005 Probability of presence: R = Rare U = Uncommon C = Common A = Abundant Status: R = Resident S = Summer W = Winter T = Transient Sources: American Ornithologists' Union 1998; National Geographic Society 2002; Tucson Audubon Society 2004.			

Amphibians and Reptiles

No species of amphibian or reptile was observed at Rancho Seco during site reconnaissance on 21 January 2005. In September 2002, Side-blotched Lizard, Tree Lizard, and Western Whiptail lizards were observed during the initial site reconnaissance.

Table 4 is a compilation of amphibian and reptile species that are likely residents of Rancho Seco and vicinity.

TABLE 4 AMPHIBIAN AND REPTILE SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO			
Common Name	Scientific Name	Habitat	Probability of Presence
AMPHIBIANS			
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	A highly aquatic-associated species found in rocky streams, usually with deep pools. Normally found from oak to pine elevations, but may be present down into desert elevations.	M
Couch's spadefoot (toad)	<i>Scaphiopus couchi</i>	Frequents shortgrass plains, mesquite savannah, creosote bush desert, thornforest, tropical deciduous forest, and other areas of low rainfall	H
Colorado River toad	<i>Bufo alvarius</i>	Ranges from arid mesquite-creosote bush lowlands and arid grasslands into the oak-sycamore-walnut groves in mountain canyons, often found near permanent water of springs, reservoirs, canals, and streams, but also frequents temporary pools	H
Great Plains toad	<i>Bufo cognatus</i>	Inhabits prairies or deserts, often breeding after heavy rains in summer in shallow temporary pools or quiet water of streams, marshes, irrigation ditches, and flooded fields, frequents creosote bush desert, mesquite woodland, and sagebrush plains	H
Red-spotted toad	<i>Bufo punctatus</i>	Desert streams and oases, open grassland and scrubland, oak woodland, rocky canyons and arroyos, in crevices among rocks for shelter, breeds in rain pools, reservoirs, and temporary pools of intermittent streams	M
REPTILES			
Western banded gecko	<i>Coleonyx variegatus</i>	Creosote bush flats and sagebrush desert to the piñon-juniper belt; catclaw-cedar-grama grass plant community to chaparral; often associated with rocks; occurs on barren dunes in some portions of its range	M
Greater earless lizard	<i>Cophosaurus texanus</i>	Found at middle elevations where cactus, mesquite, ocotillo, creosote bush, and palo verde grow. Found in sandy, gravelly soils of flats, washes, and intermittent stream bottoms where plants are sparse and there are open areas for running. Occasionally found on rocky	L

<p align="center">TABLE 4 AMPHIBIAN AND REPTILE SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO</p>			
Common Name	Scientific Name	Habitat	Probability of Presence
		hillsides.	
Zebra-tailed lizard	<i>Callisaurus draconoides</i>	Frequents washes, desert pavement, and hardpan where growth is scant and there are open areas for running. Occasionally found in rocky arroyos and on windblown sand.	H
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>	Inhabits arid and semi-arid plains grown to bunch grass, alkali bush, sagebrush, creosote bush, or other scattered low plants. The ground may be hardpan, gravel, or sand. Rocks may or may not be present. This lizard avoids dense grass and brush, which interfere with running.	L
Desert spiny lizard	<i>Sceloporus magister</i>	Inhabits arid and semi-arid regions on plains and lower slopes of mountains. Found in Joshua tree, creosote bush, and shadscale deserts, mesquite-yucca grassland, juniper and mesquite woodland, subtropical thornscrub, and along rivers grown to willows and cottonwoods.	H
Side-blotched lizard	<i>Uta stansburiana</i>	Found in sand, rock, hardpan, or loam with grass, shrubs, and scattered trees. Often found along sandy washes where there are scattered rocks and low-growing bushes.	H
Tree lizard	<i>Urosaurus ornatus</i>	A climbing lizard that spends much of its time in trees or on rocks. Frequents mesquite, oak, pine, juniper, alder, cottonwood, tamarisk, and eucalyptus, but can also occur in treeless areas. Ranges from desert to lower edge of the spruce-fir zone, frequently found near rivers.	H
Regal horned lizard	<i>Phrynosoma solare</i>	Frequents rocky and gravelly habitats of arid and semi-arid plains, hills, and lower slopes of mountains. Much of its range is in succulent plant habitat of upland desert. Plants present may include cactus, mesquite, and creosote bush. Seldom found on sandy flats.	M
Western whiptail	<i>Cnemidophorus tigris</i>	Ranges from deserts to pine forests in the mountains. Also found in woodland, streamside growth, and in the warmer, drier parts of forests. Avoids dense grassland and thick shrubs.	H
Gila monster	<i>Heloderma suspectum</i>	Inhabits chiefly shrubby, grassy, and succulent desert; occasionally enters oak woodland. Found in canyon bottoms or arroyos with permanent or intermittent streams, where it digs burrows or uses those of other animals.	M
Coachwhip	<i>Masticophis flagellum</i>	Frequents a variety of habitats including desert, prairie, scrubland, juniper-grassland, woodland, thornforest, and farmland. Generally avoids	H

<p align="center">TABLE 4 AMPHIBIAN AND REPTILE SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO</p>			
Common Name	Scientific Name	Habitat	Probability of Presence
		dense vegetation. Ground surface may be flat or hilly, sandy or rocky.	
Glossy snake	<i>Arizona elegans</i>	Occurs in a variety of habitats-light shrubby to barren desert, sagebrush flats, grassland, chaparral-covered slopes, and woodland. Generally prefers open areas. Ground is often sandy or loamy but some rocks may be present. Excellent burrower.	M
Gopher snake	<i>Pituophis melanoleucus</i>	Lives in a variety of habitats, from the lowlands high into the mountains and from coast to coast. Frequents desert, prairie, brushland, woodland, open coniferous forest, and farmland. Especially common in grassland and open brushland in West. Soil conditions vary-sand, loam, rock, or hardpan.	H
Common Kingsnake	<i>Lampropeltis getulus</i>	Frequents a great variety of habitats – coniferous forest, woodland, swampland, coastal marshes, river bottoms, farmland, prairie, chaparral, and desert. Often found in vicinity of rock outcrops and clumps of vegetation and under rotting logs, old lumber, and rocks.	M
Long-nosed snake	<i>Rhinocheilus lecontei</i>	Inhabitant of deserts, prairies, shrubland, and tropical habitats.	H
Ground snake	<i>Sonora semiannulata</i>	Secretive snake of arid and semiarid regions, where the soil may be rocky, gravelly, or sandy and has some subsurface moisture. Frequents river bottoms, desert flats, sand hummocks, and rocky hillsides where there are pockets of loose soil. Vegetation may be scant as in creosote bush desert, but along Colorado River, this snake occurs among thickets of mesquite, arrowweed, and willows. Ranges from prairies through desert plant communities, thornscrub, piñon-juniper to the oak-pine zone.	L
Night snake	<i>Hypsiglena torquata</i>	Frequents a variety of habitats – grassland, chaparral, sagebrush flats, deserts, woodland, moist mountain meadows, thornscrub, and thornforest. Occurs in both rocky and sandy areas.	M
Sonoran or Arizona coral snake	<i>Micruroides euryxanthus</i>	Found in a variety of habitats including thornscrub, brushland, woodland, grassland, and often among rocks. Most abundant in rocky upland desert, especially along arroyos and river bottoms.	L

<p align="center">TABLE 4 AMPHIBIAN AND REPTILE SPECIES THAT ARE LIKELY TO BE PRESENT AT RANCHO SECO</p>			
Common Name	Scientific Name	Habitat	Probability of Presence
Western diamondback rattlesnake	<i>Crotalus atrox</i>	Frequents a variety of habitats from the plains into the mountains – desert, grassland, shrubland, woodland, open pine forests, and rank growth of river bottoms. Ranges from sandy flats to rocky upland areas.	H
Mojave rattlesnake	<i>Crotalus scutulatus</i>	Chiefly inhabits upland desert and lower mountain slopes, but ranges to about sea level near the mouth of the Colorado River and to high elevations in the Sierra Madre Occidental. Habitats vary – barren desert, grassland, open juniper woodland, and scrubland. Seems to be common in areas of scrubby growth such as creosote bush and mesquite. Not common in broken rocky terrain or where vegetation is dense.	M
Source: Degenhardt et al. 1996; Stebbins 2003			

PRIORITY VULNERABLE SPECIES AND SPECIAL ELEMENTS

As part of the SDCP planning process, Pima County, its Scientific Technical Advisory Team (STAT), and its principal consultant RECON developed a list of priority vulnerable species (PVS) in Pima County. The PVS list contains a total of 55 species; 9 mammals, 8 birds, 2 amphibians, 9 reptiles, 6 fish, 1 arthropod, 13 talus snails, and 7 plants (Pima County 2004).

An important consideration for Pima County as it acquires lands to help meet the stated goal of the SDCP is the extent to which a particular parcel functions to provide resources needed in the life cycles of the PVS. A parcel does not necessarily have to have populations of one or more PVS living on it in order for it to be of value. It may, for example, provide connectivity between two or more other areas within the CLS and, therefore, be of value in facilitating movement and gene flow between areas.

Table 5 is a listing of PVS and status of priority conservation areas (PCA). PVS are included in this table if the habitat models indicated the presence of moderate or high quality habitat for a particular species at Rancho Seco. Examination of maps of PCAs revealed that PCAs 1, 2, and 4 were present on the Rancho Seco property for 16 of the 28 species included in the table. PCAs 1, 2, and 4 are defined as follows:

PCA 1 – Sites that must be in the reserve system to assure continued existence of a particular species in Pima County.

PCA 2 – Sites that would be of value to reserve system.

PCA 4 – Sites or areas with the potential for restoration or enhancement

TABLE 5 PRIORITY VULNERABLE SPECIES WITH MODELED HIGH OR MODERATE HABITAT, PRIORITY CONSERVATION AREA (PCA) STATUS, AND AN ESTIMATE OF PROBABILITY OF OCCURRENCE FOR EACH AT RANCHO SECO			
Common Name	Scientific Name	PCA	Probability
MAMMALS			
Allen's Big-eared Bat	<i>Idionycteris phyllotis</i>	None	Very Low
Arizona Shrew	<i>Sorex arizonae</i>	None	Very Low
California Leaf-nosed Bat	<i>Macrotus californicus</i>	Priority 4	High
Lesser Long-nosed Bat	<i>Leptonycteris curasoae yerbabuenae</i>	Priority 2	Low
Merriam's Mouse	<i>Peromyscus merriami</i>	None	Moderate
Mexican Long-tongued Bat	<i>Choeronycteris mexicana</i>	Priority 2	Moderate
Pale Townsend's Big-eared Bat	<i>Plecotus townsendii pallescens</i>	Priority 2	High
Western Red Bat	<i>Lasiurus blossevillii</i>	Priority 2	Low
Western Yellow Bat	<i>Lasiurus ega</i>	None	Very Low
BIRDS			
Abert's Towhee	<i>Pipilo aberti</i>	Priority 1	Very High
Bell's Vireo	<i>Vireo bellii</i>	Priority 1	High
Cactus Ferruginous Pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	Priority 1	Low
Rufous-winged Sparrow	<i>Aimophila carpalis</i>	Priority 1	Present
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	None	Very Low ¹
Swainson's Hawk	<i>Buteo swainsoni</i>	Priority 1	High ²
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>	None	Low
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Priority 1	Low
AMPHIBIANS AND REPTILES			
Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	Priority 2	Moderate
Lowland Leopard Frog	<i>Rana yavapaiensis</i>	Priority 2	Low
Desert Box Turtle	<i>Terrapene ornata luteola</i>	Priority 2	Low
Giant Spotted Whiptail	<i>Cnemidophorus burti stictogrammis</i>	Priority 2	Low
Ground Snake	<i>Sonora semiannulata</i>	None	Very Low
Mexican Garter Snake	<i>Thamnophis eques megalops</i>	None	Low
Tucson Shovelnose Snake	<i>Chionactis occipitalis klauberi</i>	None	Very Low
PLANTS			
Acuña Cactus	<i>Echinomastus erectocentrus</i> var. <i>acunensis</i>	None	Very Low
Gentry Indigobush	<i>Dalea tentaculoides</i>	Priority 2	Very Low
Huachuca Water Umbel	<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>	None	Very Low
Pima Pineapple Cactus	<i>Coryphantha scheeri</i> var. <i>robustispina</i>	None	Low
¹ - May be present during spring or fall migration ² - Most likely present only during spring or fall migration, formerly nested in grasslands across southern Arizona			

The following are brief species accounts for each of the species listed in Table 5 and further discussion of the suitability of Rancho Seco for each species.

Mammals

Allen's Big-eared Bat (*Idionycteris phyllotis*)

Allen's Big-eared Bat is considered a species of concern by the U.S. Fish & Wildlife Service (USFWS) (Pima County 2004). Most of the lands at Rancho Seco are modeled medium potential habitat for this species with no PCAs present. Given the known distribution of this species and the fact that it has not been recorded in Pima County, we rate the probability of its presence at Rancho Seco very low (Table 5).

This species is known from areas of ponderosa pine (*Pinus ponderosa*), piñon-juniper, riparian woodlands, and desert scrub from the northwest corner of Arizona to the Southeast corner. It is not known from lowland desert scrub habitats in the southwestern part of the state (Hoffmeister 1986). It is often found in association with boulder piles, cliffs, rock outcroppings, and lava flows. This bat is easily netted over streams or ponds where it may be searching for insects or coming for water. Mesquite, whitethorn acacia (*Acacia constricta*) and agave are often found in association with water sources in the Mohave Desert where this bat is found. Allen's Big-eared Bat is known to roost in mine tunnels, rock piles, and under exfoliating bark of conifer trees. Females form maternity colonies in early summer and young are born in mid to late June and fledge by the end of July. Diet of this species consists of insects, mainly moths, soldier beetles, dung beetles, leaf beetles, roaches, and flying ants, all taken in flight (Pima County 2004).

Allen's Big-eared Bat has not been taken in Pima County although it is suspected of occurring there (Pima County 2004). Two specimen's labeled Allen's Big-eared Bat taken in Tucson Mountains are housed in the University of Arizona mammalogy collections. Close examination of these two specimens revealed that they are both misidentified Pale Townsend's Big-eared Bat (*Plecotus townsendii pallescens*)(E.L. Smith, Personal Observation with Dr. Yar Petryszyn 2001).

Arizona Shrew (*Sorex arizonae*)

The Arizona Shrew is considered a species of concern by the USFWS, wildlife of special concern in Arizona by the Arizona Game and Fish Department (AGFD), and a sensitive species by the U.S. Forest Service (USFS). It is considered vulnerable status 2 by the SDCP (Pima County 2004) for which modeled habitat at Rancho Seco is a mix of medium and high with no PCA. Given the known distribution of this species in Arizona (see below), we rate the probability of it being present at Rancho Seco as very low (Table 5).

All records of this species in Arizona are from high mountain ranges with two records in Pima County from higher elevations (i.e., 8,500 feet in Stone Cabin Canyon) in the Santa Rita

Mountains (Hoffmeister 1986). The biology of this tiny mammal is largely unknown. The Arizona Shrew has only been captured during or after the peak of the summer rains, which leads scientists believe that summer rains might trigger breeding and dispersal and that the animal apparently has a long dormant period. If it is like other shrews, it is a voracious predator during the active season consuming arthropods, earthworms, and slugs (Pima County 2004).

California Leaf-nosed Bat (*Macrotus californicus*)

The California Leaf-nosed Bat is listed as a federal species of concern by the FWS, sensitive by the USFS, and wildlife of special concern in Arizona by the AGFD. It is considered vulnerable status 2 in the SDCP (Pima County 2004). Rancho Seco is a mix of modeled habitat ranging from low to high with a Priority 4 PCA occupying approximately the eastern half of the property. We consider the probability of Rancho Seco being utilized by this species to be high (Table 5).

In Arizona, this bat is usually found in caves and mines in areas of Sonoran desert scrub where it remains throughout the year. They feed on large, night flying beetles grasshoppers, and moths, which they take in flight, and insect larvae, which they take off of shrubbery and off the ground. The habit of taking insects off the ground may be the reason that this species is occasionally taken in rat and mouse traps. Apparently insects attracted to the bait on the trap in turn attract bats, which are caught in the trap (Hoffmeister 1986). Males establish leks in mines or caves and females come to the leks in the fall to select a mate. Embryological development is delayed until March and females give birth during May and June (Pima County 2004).

There are numerous prospects, mines, and shafts on Rancho Seco lands (United States Geological Survey 1981; 1979), many of which could probably be used by this species. The species has been collected at the Ajax Mine just south of Arivaca at approximately 4,000 feet elevation (Hoffmeister 1986). Given the locality at the Ajax Mine coupled with the large number of mines and shafts at Rancho Seco, we believe the probability of this bat being present is high.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuenae*)

The lesser long-nosed bat was federally listed as an endangered species on September 20, 1988 (USFWS 1988). At the time of listing, populations of this species were believed to be declining rapidly (BISON 2004), although there is some debate about the actual status and trends in the population (Cockrum and Petryszyn 1991). A recovery plan was published in May 1995 (USFWS 1995). The lesser long-nosed bat is also listed as a wildlife species of special concern by the AGFD, as a sensitive species by the USFS, and has a vulnerable status 2 listing in the SDCP (AGFD 2004; Pima County 2004). Rancho Seco contains a mix of modeled potential habitat that ranges from low to high, with modeled high quality habitat dominating. The eastern three-fourths of Rancho Seco contains a Priority 2 PCA. Forage species, especially saguaro cacti and paniculate agaves are not present at Rancho Seco. Given the absence of suitable forage plant species at Rancho Seco, we rate the probability of this species being present as low.

This species is migratory, wintering in Mexico and migrating north into Arizona for the summer and early fall. These bats normally roost and have maternity colonies in caves or in abandoned mine tunnels (Hoffmeister 1986). The lesser long-nosed bat feeds primarily on pollen and nectar, of agaves, saguaro, and organ pipe cactus (*Stenocereus thurberi*), but they will also feed on fruits and seeds of saguaros and organ pipes (Hoffmeister 1986). They serve as important pollinators and seed-dispersers for these species. Typical habitats for this species include Sonoran Desert scrub and semi-desert grassland, lower edges of oak woodlands, and cottonwood and sycamore riparian areas. Specific habitat features include a good supply of suitable plant species for foraging and access to favorable roost sites (BISON 2004).

Merriam's Mouse (*Peromyscus merriami*)

Merriam's mouse is considered wildlife of special concern in Arizona by the AGFD, and it is also considered vulnerable status 1 by SDCP (Pima County 2004). Modeled potential habitat for this species at Rancho Seco is mostly rated as medium with some high potential in the mesquite thickets associated with Sopori Wash on the eastern side of the property. There is no PCA for this species at Rancho Seco. We have rated the probability of this species occurrence at Rancho Seco as moderate. This rating is based on recent surveys for this species in the Tucson area where Merriam's Mouse has been found in a range of habitats on fairly fine soils and dominated by mesquite with very little to well-developed ground cover (K. Kingsley, Personal Communication, December 2005). Mesquite-dominated habitats along Sopori Wash and at other locations at Rancho Seco may well support populations of this mouse. Also, Rancho Seco is well within the known geographic distribution of this mouse.

Mexican Long-tongued Bat (*Choeronycteris mexicana*)

This bat is considered a species of concern by the USFWS and wildlife of special concern by the AGFD (Pima County 2004). Modeled potential habitat for the Mexican Long-tongued Bat at Rancho Seco is a mix of low, moderate, and high with most rated as moderate. Portions of two Priority 2 PCAs overlie Rancho Seco. One PCA covers the southwestern one-third of the property in the Las Guijas Mountains and the second covers a small portion of the northern-most part of the property in the Cerro Colorado Mountains. Given the known distribution of this species in Arizona, we rate the probability of occurrence at Rancho Seco as moderate. The vast majority of records for this species are in northeastern and eastern Pima County, Santa Cruz County, and Cochise County. The species has been collected at Ruby to the south of Rancho Seco and at several locations in the Santa Rita Mountains to the east of Rancho Seco (Hoffmeister 1986).

These bats utilize canyons of mixed oak-conifer forests in mountain ranges surrounded by desert and also in semidesert grasslands. Roost sites are usually near a water source and riparian vegetation and include caves, inactive mines, unoccupied buildings, and wide rock crevices, which are used as day and night roosts. Population groups usually have 15 or fewer individuals. They hang approximately 0.8 to 2.0 inches (2-5 cm) apart, commonly by one foot, so that they

can rotate 360 degrees to observe intruders. They migrate to Mexico during the winter and do not hibernate. During the summer females are found at the northern extent of their range in southern Arizona, where they stay in nursery colonies. Young are born between mid to late June and early July and they can fly within 2 to 3 weeks. This species is a nectar and pollen feeder and probably also eats insects found in flowers. Paniculate agaves are a major source of food (Pima County 2004).

Pale Townsend's Big-eared Bat (*Plecotus townsendii pallescens*)

This bat is considered a species of concern by the USFWS and wildlife of special concern in Arizona by the AGFD. It is also considered vulnerable status 2 in the SDCP (Pima County 2004). Modeled potential habitat for this species at Rancho Seco ranges from low to high with most of the property modeled as a mix of medium and high habitat potential. Based on the modeled habitat and the known distribution of this species, we rate the probability of occurrence at Rancho Seco as high (Table 5). A Priority 2 PCA covers the southwestern three-fourths of Rancho Seco.

The Pale Townsend's big-eared bat has been found through a range of elevations and vegetation communities including Sonoran desert scrub, Madrean evergreen woodland, and coniferous forests in Arizona (Pima County 2004). During the day they are usually in caves or mine tunnels, but at night they can be found in abandoned buildings. In the summer, pregnant females form nursery or maternity colonies separate from the males and in the winter, they hibernate (Hoffmeister 1986). These bats mate during October, but delayed implantation occurs, so young are born from late April to mid-July. Only one young is born per year. The pale Townsend's big-eared bat's diet consists mostly of small moths that it catches in flight. It may also take insects off vegetation while in flight (Pima County 2004).

Western Red Bat (*Lasiurus blossevillei*)

The western red bat is considered wildlife of special concern by the AGFD and sensitive by the USFS. It is a vulnerable status 2 species in the SDCP (Pima County 2004). Modeled potential habitat for this species at Rancho Seco is mostly moderate with some areas of high along Soporì Wash. Priority 2 PCAs overlie part of the Cerro Colorado Mountains in the north and the Las Guijas Mountains in the southwest. Given the known distribution of this species, coupled with the fact that it is generally absent from desert areas, we rate the probability of occurrence at Rancho Seco at low. Limited areas of broadleaf riparian habitat along washes at Rancho Seco may occasionally play host to this species.

This bat is known only from broadleaf riparian deciduous forests and woodlands in trees such as walnuts, sycamores, and cottonwoods at elevations from 2,400 to 7,200 feet. Red Bats roost singly or in limited family groups of female and progeny in thick vegetation. Roosting sometimes occurs in saguaro cavities and cave-like environments, although this bat is rarely recorded from caves and buildings. Western red bats have been found in fruit orchard trees (Pima

County 2004). It is insectivorous, eating moths, flies, beetles, cicadas, ground-dwelling crickets, hemipterans, and hymenopterans. Mating occurs in August and October, but females store sperm until spring when fertilization occurs. Gestation is approximately 60 to 70 days, and 1 to 5 young are born from late May to mid-June. Lactation lasts for 5 to 6 weeks, and the young fledge between their third and fourth weeks (Pima County 2004).

Western Yellow Bat (*Lasiurus ega*)

The Western Yellow Bat is considered wildlife of special concern in Arizona by the AGFD and sensitive by the USFS. It is considered vulnerable status 2 in the SDCP (Pima County 2004). Modeled potential habitat at Rancho Seco is mostly low with scattered polygons of medium. Approximately 50 percent of the property has no habitat rating at all. There are patches of high-rated habitat along Sopori Wash and there are no priority PCAs for this species at Rancho Seco. Based on known distribution and habitat selection (see below), we rate the probability of this species occurring at Rancho Seco at very low.

This bat is a tropical species that ranges from the southern U.S. south to Uruguay and Argentina. It is known from urban settings in Arizona where it is found most commonly in association with the Washington fan palm (*Washingtonia filifera*) (Hoffmeister 1986). The pelage of this species is nearly identical to the color of dead palm fronds. It can also be found in deciduous trees in riparian areas. The Western Yellow Bat is insectivorous (Pima County 2004).

Birds

Abert's Towhee (*Pipilo aberti*)

Abert's Towhee has no federal or state status, but it is considered a vulnerable status 1 species by the SDCP (Pima County 2004). Modeled potential habitat for this species consists of several polygons of medium and high potential habitat along drainage ways including Sopori and Las Guijas Washes. We consider the probability of Abert's Towhee being present at Rancho Seco to be very high. There is a Priority 1 PCA for this species along the reach of Sopori Wash that is on Rancho Seco lands. Las Guijas Wash near the Montaña Ranch also appears to be highly suitable habitat for Abert's Towhee.

Habitat for this species is Sonoran riparian deciduous woodland and riparian scrubland with a dense understory of shrubs. Permanent territories for mated pairs are generally 3.75 to 5 acres (1.5 to 2 ha). This species is monogamous, and pair bonds are life-long. In February to April the female constructs a cup nest in trees and shrubs 4 to 7 feet from the ground. Second broods are common, and if a nest is unsuccessful, a pair may try up to 6 times to renest. Clutches are usually 1 to 5 pale blue eggs with dark mottles. The eggs are incubated for 14 days, and the young stay in the nest for 12 to 13 days. Fledglings remain with their parents for another 4 to 5 weeks (Pima County 2004).

Abert's Towhee eats insects and seeds. Beetles and ants are consumed year-round, many caterpillars are consumed in the fall, winter, and spring, and grasshoppers and cicadas are important foods during the summer (Pima County 2004).

Bell's Vireo (*Vireo bellii*)

Bell's vireo has no federal or state status except for being included in the Migratory Bird Treat Act as are all but a small number of North American birds. Modeled potential habitat for this species at Rancho Seco consists of limited polygons of medium and high habitat potential along Sopori Wash and other small drainage ways. Given the presence of highly suitable habitat for this species on Sopori Wash, we rate the probability of this species occurring at Rancho Seco at high. There is a Priority 1 PCA for Bell's Vireo along Sopori Wash, which supports a very good, dense stand of large mesquites.

This species is an inhabitant of dense, low, shrubby vegetation in riparian areas, usually along lowland stream courses with willows, mesquite, and seepwillows. It is also found in tamarisk-dominated areas along the Colorado River in the Grand Canyon. Birds return from wintering grounds in Mexico and Central America in April with breeding occurring from April through July. Pairs are generally monogamous and lay clutches of 3-5 eggs that are incubated for 14 days by both parents. Fledglings leave the nest in 11 to 12 days. Pairs usually only produce one brood per season, but second broods are not uncommon. Bell's Vireo is almost entirely insectivorous during the breeding season, supplementing this with small quantities of fruit. The winter diet is unknown (Pima County 2004).

Cactus Ferruginous Pygmy Owl (*Glaucidium brasilianum cactorum*)

The cactus ferruginous pygmy-owl is federally listed as an endangered species, is considered a wildlife species of special concern by the AGFD, is a Forest Service sensitive species, and has vulnerable status 1 in the SDCP. The species is also threatened in Mexico (AGFD 2004; Pima County 2004). Modeled potential habitat for this species on Rancho Seco ranges from no habitat to high with most of the property being rated at moderate potential. High potential habitat is associated with Sopori Wash, Las Guijas Wash, and several unnamed drainage ways on the property. The entire property lies within a Priority 1 Conservation Area. We rate the probability of occurrence of this bird at the Rancho Seco at low. Our probability rating is based on habitat types present on the ranch, which do not represent suitable nesting habitat. The proximity of Rancho Seco to known populations in the Altar Valley and probable populations on Tohono O'Odham Nation lands suggests that Rancho Seco could provide suitable dispersal habitat to one or both of those populations.

Cactus Ferruginous Pygmy-owls can be found in three general vegetation community types (USFWS 2000a and 2000b). These communities include: (1) riparian vegetation with broadleaf gallery forests of cottonwood, willow, mesquite, or other species along a watercourse; (2) Sonoran Desertscrub with braided wash systems and mesquite, palo verde, saguaro,

ironwood, and other shrubs and cacti; and (3) Semidesert grasslands with wooded drainages with mesquite, hackberry, ash, and a limited number of saguaros.

Pygmy-owls are cavity-nesters, usually using nest cavities excavated and abandoned by woodpeckers. Most recent nests have been in cavities in saguaros, but historically these birds also used cavities in cottonwoods, willows, and mesquite (USFWS 2000a). Cactus ferruginous pygmy-owls will feed on a wide variety of prey items, including birds, small mammals, reptiles, insects, scorpions, and caterpillars (Terres 1980; USFWS 2000a). They typically hunt from a perch and are most active at night, but are also active at dawn and dusk, and they may even be active during the day (Terres 1980).

Rufous-winged Sparrow (*Aimophila carpalis*)

The Rufous-winged sparrow has no federal or state status (Pima County 2004). Rufous-winged Sparrows were at one time thought to be extinct in the United States. Herbert Brown collected an individual bird at Tucson in 1886; thereafter not a single Rufous-winged Sparrow was found in southern Arizona for a half-century. The birds reappeared in the mid-1930's and underwent an extraordinary range expansion in the mid-1950s. According to Phillips (1968) few species in southern Arizona have shown such drastic fluctuations in habitat and numbers.

Modeled potential habitat for this species at Rancho Seco is high with only the highest reaches of the Cerro Colorado and Las Guijas Mountains rated as low habitat potential. The entire Rancho Seco is included in a Priority 1 PCA. We list the probability of this species being on Rancho Seco as "present" (Table 5) based on hearing Rufous-winged Sparrows singing on the property on 17 September 2004.

Rufous-winged Sparrows are typically found in flat or gently hilly Sonoran desertscrub and Sinaloan thorn scrublands with scattered spiny trees and shrubs. Grasses are essential habitat components, and mesquite, desert hackberry, cholla, and palo verde are usually present as well. Territories commonly encompass some wash habitat. These birds are also found at higher elevations in oak savannahs. Diet during the breeding season consists of caterpillars, grasshoppers, and grass and weed seeds. Rufous-winged Sparrows are monogamous, and pairs maintain their territories year-round. Young usually leave the nest when they are 7 to 10 days old. Young will stay with their parents for approximately 3 weeks or until a second brood hatches (Pima County 2004).

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher was listed as endangered, without designated critical habitat, on February 27, 1995, primarily because of riparian habitat loss or modification. Critical habitat was designated on July 22, 1997, and a correction notice was published in the Federal Register on August 20, 1997, to clarify the lateral extent of this designation. Eighteen critical habitat units totaling 599 river miles in Arizona, California, and New Mexico were designated. A Draft

Recovery Plan (USFWS 2001) for the southwestern willow flycatcher was released for public review on June 8, 2001. It is considered a wildlife species of special concern in Arizona by the AGFD, a sensitive species by the USFS, and as vulnerable status 2 in the SDCP (AGFD 2004; Pima County 2004). Some habitat of modeled high potential is present on Sopori Wash and south of Rancho Seco on Arivaca Creek. There are no priority conservation areas established for this species in the vicinity of Rancho Seco. We rate the probability of this species nesting at Rancho Seco as very low.

In the western United States, willow flycatchers are often found on willow-covered islands, brush along watercourses, beaver meadows, and mountain parks. They may be found as high as 7,875 feet, and they also follow willow or cottonwood-lined streams out into desert regions (Terres 1980). Like most other flycatchers, the willow flycatcher forages primarily by flying out from a perch to capture flying insects. They tend to be fairly active, moving frequently from perch to perch (Bent 1942). They will also use gleaning techniques when foraging for spiders, millipedes, and other arthropods, and also when feeding on berries. They lay 3-4 eggs in a compact cup-shaped nest lined with fine grasses and feathers located near open water, cienegas, marshy seeps, or saturated soils (Sogge et al. 1997).

Swainson's Hawk (*Buteo swainsoni*)

This raptor is considered a species of concern by the USFWS, wildlife of special concern by the AGFD, and sensitive by the USFS (Pima County 2004). Modeled potential habitat for this species at Rancho Seco is rated high over all but the highest peaks in the Cerro Colorado and Las Guijas Mountains. Owing to the widespread distribution of this species during migration and the presence of semi-desert grassland habitat at Rancho Seco, we rate the probability of the this species occurring there as high. Rancho Seco sustains some grassland areas that are very similar to habitats in which the species breeds in southeastern Arizona (Glinski and Hall 1998)(Photos 1 and 4)

Swainson's Hawks nest in grassland, semidesert grassland, and savanna grassland, sometimes intermixed with open desert scrub habitats. They forage in open plains and grasslands and are often seen foraging over agricultural fields. Prey species include rodents, rabbits, and reptiles. Outside of the breeding season, Swainson's hawk is almost entirely insectivorous foraging throughout the pampas of Argentina. Bulky stick nests are constructed in saguaros, trees, yuccas, or on cliffs. Females generally lay two eggs, and incubation takes 28 to 35 days. Young fledge approximately 30 days after hatching. Both parents tend the young, which remain with them until migration. Usually one brood is reared per season (Pima County 2004).

Western Burrowing Owl (*Athene cunicularia hypugaea*)

The Western Burrowing Owl is listed as a federal species of concern, is considered a sensitive species by the Bureau of Land Management, and has a vulnerable status 2 listing in the SDCP (AGFD 2004; Pima County 2004). Modeled potential habitat for this species at Rancho Seco

ranges from no habitat to moderate. Well under 50 percent of the property is rated at moderate habitat potential. We rate the probability of this species using lands at Rancho Seco as low.

Burrowing owls inhabit open areas in deserts, grasslands, and agricultural and range lands. They use well-drained areas with gentle slopes and sparse vegetation, and may occupy areas near human habitation such as golf courses and airports (Dechant et al. 1999; Ehrlich et al. 1988; Terres 1980). Burrowing owls often select burrows where surrounding vegetation is kept short by grazing, dry conditions, or burning (Dechant et al. 1999; Hjertaas et al. 1995). In Arizona, burrowing owls prefer grasslands, creosote bush/bursage desertscrub communities, and agricultural lands (deVos 1998).

Burrowing owls are semi-colonial and usually occupy burrows excavated by small mammals, often at the edges of active colonies of Black-tailed Prairie Dogs (*Cynomys ludovicianus*) or Richardson's Ground Squirrels (*Spermophilus richardsonii*). In areas that lack colonial burrowing mammals, burrowing owls will use excavations made by other mammals such as Badgers, Woodchucks, skunks, foxes, Armadillos, and Coyotes. They may also use natural cavities in rocks. In addition to the nest burrow, these owls may also use several satellite burrows. Satellite burrows may serve as protection from predators and parasites (Dechant et al. 1999).

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)

The western yellow-billed cuckoo is not currently listed as a threatened or endangered species under the federal Endangered Species Act however, in 1998 there was a petition filed to review the species for possible endangered status, and it is currently a candidate for endangered listing (AGFD 2004; Pima County 2004). It is listed as a migratory bird under the Migratory Bird Treaty Act, and is considered a wildlife species of special concern in Arizona by the AGFD. It is considered vulnerable status 2 in the SDCP (Pima County 2004). There is limited modeled high habitat for this species along Sopori Wash in the eastern reaches of Rancho Seco. There is also a Priority 1 PCA for this species on Sopori Wash and on nearby Arivaca Creek. It is likely that the habitat on Arivaca Creek is much better suited to Yellow-billed Cuckoo than that on Sopori Wash, which is strongly dominated by mesquite with very limited cottonwood and no willow. The dense mesquite along Sopori Wash may be of value to migrating cuckoos. We rate the probability of Yellow-billed Cuckoos using Rancho Seco at low.

In Arizona, the western yellow-billed cuckoo will use streamside cottonwood, willow groves and large mesquite bosques for migrating and breeding (Pima County 2004). They prefer areas along riparian corridors that possess areas of dense vegetation. They are very late migrants and do not normally arrive in the breeding habitats until early June (Phillips et al. 1964). In contrast to European cuckoos, which are well-known nest parasites, the yellow-billed cuckoos build their own nests and only rarely parasitize other species (Ehrlich et al. 1992). However, when prey is abundant, this may lead to excess egg production and result in brood parasitism (Pima County 2004). The primary prey items for this species are tent caterpillars and cicadas, but their diet may also include other insects, bird eggs, frogs, lizards, berries, and fruit (AGFD 2002a; Ehrlich et al.

1988; Pima County 2004). They typically lay 3 (1-5) unmarked pale greenish blue eggs in a nest constructed 4 to 10 feet above the ground in willow or mesquite thickets (Alsop 2001; Pima County 2004).

Amphibians and Reptiles

Chiricahua Leopard Frog (*Rana chiricahuensis*)

The Chiricahua leopard frog is a listed endangered species under the ESA. It is also considered a wildlife species of special concern by the AGFD, as a sensitive species by the USFS, and has a vulnerable status 1 in the SDCP. It is also endangered in the State of New Mexico, and threatened in Mexico (AGFD 2004; Pima County 2004). Modeled high potential habitat is present for this species south of Rancho Seco on Arivaca Creek and there are polygons of moderate habitat along Sopori Wash within the property boundaries. A Priority 2 PCA overlays most of the western half of Rancho Seco. The variety of stock tanks on Rancho Seco coupled with the known presence of this species on the Buenos Aires National Wildlife Refuge, which abuts the western-most reaches of Rancho Seco, lead us to rate the probability of occurrence of this species at moderate.

The Chiricahua leopard frog is a habitat generalist, and occurs in a variety of natural and man-made aquatic habitats including main stream river reaches, intermittent creeks, seeps, stock tanks, wells, and thermal springs (AGFD 2001; Degenhardt et al. 1996). The Chiricahua leopard frog is an alert and wary species. Adult Chiricahua leopard frogs, like many Ranids, consume a variety of insect and other arthropod species, and may take small vertebrate species such as fish, and other anuran species (AGFD 2001; Degenhardt et al. 1996). The larvae feed on periphyton, algae, organic debris, and plant tissues (AGFD 2001; Pima County 2004).

The primary habitat type for this species is in aquatic environments in the oak or mixed oak and pine elevations from about 3,500 to 8,040 feet elevation in central and eastern Arizona, and down through chaparral, grasslands, and even desert to 1,219 feet (AGFD 2001).

Lowland Leopard Frog (*Rana yavapaiensis*)

The lowland leopard frog is considered a species of special concern by the USFWS, sensitive by the USFS, and wildlife of special concern in Arizona by the AGFD. It is considered vulnerable 2 status by SDCP (Pima County 2004). A portion of the southern reaches of Rancho Seco have modeled moderate habitat with a small polygon of high potential habitat in the southernmost part of the property. A Priority 2 PCA covers the westernmost part of Rancho Seco. We consider the probability of this species being present at Rancho Seco as low.

This frog is generally found in permanent waters south and west of the Mogollon Rim, for the most part below 3,000 feet (910 m) elevation in Arizona. It usually occurs in small to medium streams, but is also found in small springs, stock ponds, and occasionally in larger rivers.

Surrounding vegetation includes Sonoran desertscrub, semidesert grassland, or Madrean evergreen woodland upland vegetation communities at elevations from 800 to 5,500 feet (244 to 1,678 m). These frogs are often found near deep pools associated with root masses of large riparian trees or along sandy banks with limited vegetative structure (Pima County 2004). Adult frogs eat small invertebrates and sometimes, small vertebrates. Larvae consume algae, plant tissue, organic debris, and probably small invertebrates (Pima County 2004).

Desert Box Turtle (*Terrapene ornata luteola*)

The Desert Box Turtle has no federal or state status; however, it is considered vulnerable status 2 by SDCP (Pima County 2004). There are areas of modeled high potential habitat for this species at Rancho Seco, primarily in the east and south. There is a Priority 2 PCA that just touches the western edge of the Rancho Seco property and we rate the probability of this species presence as low despite the presence of semi-desert grassland. The Rancho Seco property is a considerable distance west of the nearest known populations of this species (Stebbins, 2003).

The Desert Box Turtle is a subspecies of the Western Box Turtle, which generally occurs on treeless plains and gently rolling country grown to grass or scattered low bushes where the soil is sandy. It also inhabits open woodlands. Box turtles breed in spring and autumn and lay clutches of 2-8 eggs in May-July. They seek shelter under boards, rocks, and other objects, and burrows they dig. Activity is stimulated by rainfall (Stebbins 2003). The diet includes beetles and other arthropods, mollusks, annelids, and carrion along with berries, melons, tender shoots, and leaves (Pima County 2004).

Giant Spotted Whiptail (*Cnemidophorus burti stictogrammus*)

The Giant Spotted Whiptail is considered a species of concern by the USFWS and a sensitive species by the BLM and the USFS. It is considered vulnerable status 2 by SDCP (Pima County 2004). There are several polygons of modeled moderate habitat for this species at Rancho Seco. One polygon is associated with the Las Guijas Mountains and has several specks of modeled high value habitat associated with it. Other polygons are located on Sopori Wash and a final moderate polygon with a speck of associated high value habitat is in the extreme southern edge of Rancho Seco. A Priority 2 PCA just catches the southwestern part of Rancho Seco and overlays part of the Las Guijas Mountains. Given the currently known distribution of the Giant Spotted Whiptail, we rate the probability of it being at Rancho Seco at low.

Giant Spotted Whiptails are found in the Lower Sonoran Life-zone, mostly in riparian areas, and Upper Sonoran Life-zone from 2,200 to 5,000 feet (670 to 1,500m). They occur in mountain canyons, arroyos, and mesas in arid and semi-arid regions, extending into desert lowlands along stream courses. They are generally found in dense shrubby vegetation, often among rocks near streams, and in grasses within woody riparian and thicket structures. They breed from May to July and lay 3 to 5 eggs. The Giant Spotted Whiptail is diurnal from spring through early fall and hibernates during the winter. Insects and spiders comprise most of their diet (Pima County 2004).

Ground Snake (*Sonora semiannulata*)

The ground snake has no federal or state status; however, it is considered vulnerable category 1 by SDCP (Pima County 2004). Modeled medium and high potential habitat for this species covers much of the Rancho Seco property with considerably more medium than high habitat. There are no Priority Conservation Areas anywhere near Rancho Seco. Given the known distribution of the Valley Form of the Ground Snake, we estimate the probability of this species being present at Rancho Seco as very low. Ground Snakes probably are present, but not the Valley Form of the species, which is the snake of concern in the SDCP.

Ground Snakes are found in desert grassland and mesquite thicket valley floors and in grassland to encinal slopes. They occur in plains, valley, and foothill habitats, but mostly near mountains with higher slopes and poorly drained soils. Vegetation can vary from sparse creosote bush desert to dense riparian communities. The ground snake eats arachnids, chilopods, and adult and larval insects. It may breed twice a year in spring to early summer and autumn. Usually 3 to 9 eggs are laid, and 3 to 7 young survive each reproductive effort (Pima County 2004).

Mexican Garter Snake (*Thamnophis eques megalops*)

The Mexican garter snake is considered a species of concern by the USFWS, wildlife of special concern by the AGFD, sensitive by the USFS, and vulnerable category 2 by SDCP (Pima County 2004). There is a very small amount of moderate and high-modeled habitat for this species at Rancho Seco. Moderate and high potential habitats are in the extreme south of the property and are associated with drainage into Arivaca Creek where considerably more modeled habitat is present. The probability of this species being present at Rancho Seco is rated as low.

This snake is found mostly in cienegas within desert grassland up to 8,500 feet (2591 m) elevation. It is sometimes associated with permanent water in cottonwood-willow riparian habitat in the desert as well as lower pine-oak woodland. It occurs in and adjacent to streams in valley floors and open areas, but not in steep mountain canyon stream habitats. It inhabits riparian vegetation communities with permanent water with no bullfrogs present (Pima County 2004).

This species grows to 18 to 49 inches (45.7-124.5 cm) and is brown to greenish brown in color with a yellow-white dorsal stripe. It has large brown blotches on the back of the head that are separated from the corner of the mouth by light-colored crescents. Their diet consists mostly of frogs, with some fish, toads, lizards, small mammals, and earthworms. Females give birth to approximately 25 young from late May to early June. Males are sexually mature at 2 years of age, while females take 2 to 3 years to become sexually mature (Pima County 2004).

Tucson Shovel-nosed Snake (*Chionactis occipitalis klauberi*)

The Tucson shovel-nosed snake has no federal or state status, but it is considered vulnerable status 1 in the SDCP (Pima County 2004). A tiny extension of modeled moderate habitat extends

onto the easternmost part of Rancho Seco. There are no Priority Conservation Areas for this species anywhere near Rancho Seco. We rate the probability of this species occurring at Rancho Seco at very low.

The Tucson shovel-nosed snake is a nocturnal desert dweller that is frequently found in washes, dunes, sandy flats, loose soil, and rocky hillsides with sandy gullies or pockets of sand among the rocks where it can burrow. Vegetation is often sparse – creosote bush, desert grasses, cactus, or mesquite. This snake eats insects, spiders, scorpions, centipedes, and buried moth pupae (Stebbins 2003). It has a shovel-shaped snout, and its head is a little wider than the neck. Females lay a clutch of 2-4 (but sometimes as many as 9) eggs in the summer (Stebbins 2003).

Plants

Acuña Cactus (*Echinomastus erectocentrus acunensis*)

The Acuña cactus is considered a candidate species by the USFWS and highly safeguarded by the Arizona Department of Agriculture (ADA) (Pima County 2004). Modeled potential habitat for this species at Rancho Seco is a mix of low and moderate with medium potential habitat being most common. Based on the currently known distribution of this species, known elevational range, and preferred habitat type, we rate the probability of encountering this plant at Rancho Seco as very low.

This cactus grows on well-drained knolls and gravel ridges between major washes from 1,300 to 2,000 feet (397-610m) elevation. It is found in granite, limestone hills and flats, and bright red to white andesite substrates. The currently known distribution of this species finds small number of the plants on the Organ Pipe Cactus National Monument and on the Barry M. Goldwater Range northwest of Ajo, Arizona. Acuña cactus is found in open exposures in relatively pristine areas and cannot tolerate substrate disturbance. The Acuña cactus flowers from March to mid-April. Germination is mostly during the summer monsoon season (Pima County 2004).

Gentry Indigo Bush (*Dalea tentaculoides*)

Gentry indigo bush is considered a species of concern by the USFWS, highly safeguarded by the ADA, a USFS and BLM sensitive species, and a vulnerable status 1 species by the SDCP. Modeled potential habitat for this species on Rancho Seco occurs as scattered polygons of moderate. There is a tiny area of Priority 2 PCA in the extreme southeastern corner of Rancho Seco in the vicinity of Moyza Canyon. Given the known distribution of this plant in Pima County, the Baboquivari Mountains, we rate the probability of the plant being present at Rancho Seco as being very low.

Dalea tentaculoides is a plant that grows along canyon bottoms on primary terraces subject to occasional flooding and possibly on rocky slopes at elevations of 3,600-4,000 feet. Plants typically grow in sandy, gravelly loam in full sun or partial shade (Arizona Rare Plant

Committee, undated). The species has been recorded from Mendoza Canyon and Kitt Peak in the Baboquivari and Quinlan Mountains, respectively (Pima County 2004). Apparently the most significant known population of this species is in the Goodding Research Natural Area in Sycamore Canyon, Atascosa Mountains, Santa Cruz County.

Huachuca Water Umbel (*Lilaeopsis schaffneriana* var. *recurva*)

The Huachuca water umbel was listed as endangered under the ESA by the USFWS in 1997. It is considered a Forest Service sensitive species, is listed as highly safeguarded under the Arizona Native Plant Law (ANPL), and has a vulnerable status of 1 in the SDCP (AGFD 2004; Pima County 2004). High and moderate modeled potential habitat is present for this species along Sopori Wash and Arivaca Creek. Most of the high potential habitat is outside the boundaries of Rancho Seco, but there are some small polygons of high potential habitat within the reach of Sopori Wash that is within the Rancho Seco boundary. There is no priority conservation designation within Rancho Seco for this species. Given the nature of the habitat on Sopori Wash (see Photo 5), coupled with the known distribution of Huachuca water umbel, we rate the probability of this plant being present at Rancho Seco at very low.

The Huachuca water umbel is an herbaceous, semi-aquatic to aquatic perennial plant of generally low stature [4-8 (22.5) cm in length] with hollow, slender leaves from rhizomes. The inconspicuous flowers arise from the leaf bases between June and August. The plants are susceptible to scouring floods (ARPC 2001).

Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*)

This cactus is federally listed as an endangered species and is considered highly safeguarded by ADA (Pima County 2004). The majority of Rancho Seco lands are modeled as moderate or high potential for this species. There are no Priority Conservation Areas for this species at Rancho Seco. Given the known distribution of Pima pineapple cactus coupled with the relatively high elevation of most of Rancho Seco, we rate the probability of the plant being present as low.

The Pima pineapple cactus is found along ridges in semidesert grassland and alluvial fans in the Arizona Upland subdivision of Sonoran desertscrub. It is usually found on flat ridgetops with little slope and in soils that are mostly rocky loams at elevations of 2,300 to 5,000 feet (702-1,525 m), although the Arizona Rare Plant Committee (undated – *Arizona Rare Plant Field Guide*) gives an elevational range of 2,800 – 3,500 feet. It can also occur in the lower edge of southwestern oak woodland. These plants reproduce during the summer rainy season. They flower 5 to 7 days after the first summer rains of at least 3 mm and continue through the monsoon season (Pima County 2004).

Special Elements

Special elements are landscape features that were used in reserve design for the SDCP. A total of 21 special element targets have been selected by the STAT. All but one (low elevation valley floors) of these elements were utilized to help guide reserve design (Pima County 2002b). The STAT also assigned conservation goals to each special element:

Constraint – STAT’s preference is to capture all occurrences of that feature in all reserve design alternatives regardless of size.

Preference – STAT suggests capturing as many sites as possible, but in larger management units only.

Restore and Manage – These goals are intended to show elements that have been so reduced over time that there is now a desire to restore them or to manage them against further loss.

Accounting – This “goal” is applied to widespread conservation targets with the objective of keeping track of losses over time.

Special element constraints and preferences were utilized, in part, to define the biological core of the CLS.

The following is a brief discussion of special elements present at Rancho Seco. Special elements present on the property include the following:

Mesquite Riparian
Mixed Grass-scrub
Interior Southwestern Riparian Deciduous Forest

Mesquite Riparian

This plant community has a constraint/restore goal in the SDCP. This community is common at Rancho Seco along major and minor washes. It probably reaches its greatest development and stature along Sopori Wash, but it is very prominent on other washes including Las Guijas Wash and Calera Wash. On all three of these washes, mesquite trees are large enough and dense enough to provide suitable habitat for species such as Bell’s Vireo and Abert’s Towhee.

Mixed Grass-Scrub

Mixed Grass-scrub has a preference goal and is the overwhelmingly dominant community type at Rancho Seco. With the exception of mesquite riparian along the washes and local occurrences of dense stands of ocotillo, mixed grass-scrub is the plant community at Rancho Seco.

Interior Southwestern Riparian Deciduous Forest

Interior southwestern riparian deciduous forest is present at Rancho Seco in the form of individual cottonwood, velvet ash, and canyon hackberry trees. These species are all present along Las Guijas Wash in the vicinity of Montaña Ranch, but do not really achieve “forest” configuration. It is likely that one or more of these species is also present on Sopori Wash within the Rancho Seco property boundaries, but none was noted where the access road to Rancho Santa Lucia crosses Sopori Wash.

EXISTING DISTURBANCE AND EVIDENCE OF HUMAN ACTIVITY

Cattle ranching has been the dominant land use at Rancho Seco, probably for more than a century. Ranch buildings, stock tanks, water tanks, wells, windmills, fences, corrals and roads are all obvious evidences of human activity associated with ranching (Photographs 15, 16, and 17). In addition to ranching, Rancho Seco has a history of mining as evidenced by the Cerro Colorado Mine. (Photograph 18) Other than Cerro Colorado, there are nine other named mines and numerous prospects and shafts on Rancho Seco (USGS 1979a; 1979b; 1979c; and 1981). In addition to ranching and mining, other evidence of human activity included spent shot shells and cartridges from hunters, fire rings from camps, discarded bottles, cans, and wrappers, and abandoned vehicles (Photograph 19).

CONCLUSIONS AND RECOMMENDATIONS

Rancho Seco presents a good example of semidesert grassland and open mesquite woodland. The property is strongly dominated by mesquite with reasonably good ground cover generally dominated by snakeweed with variable presence of range grasses.

A total of eight Priority Vulnerable Species have moderate to very high potential of being present at Rancho Seco and ninth species, the Rufous-winged Sparrow was detected there on 17 September 2002. We believe there is very high probability that Abert's Towhee occupies Rancho Seco lands. Other species with moderate to high probability include Allen's Big-eared Bat, Lesser Long-nosed Bat, Mexican Long-tongued Bat, Merriam's Mouse, and Chiricahua Leopard Frog. Lesser Long-nosed Bats are likely to be present at Rancho Seco only as spring or fall transients as the site offers very little in the way of foraging opportunities for this species. We believe the probability of presence of Pima pineapple cactus is very low owing to the extent of existing ground cover and the elevation of Rancho Seco.

Other Priority Vulnerable Species with moderate or high modeled habitat at Rancho Seco were accorded low or very low probability of occurring because of a lack of suitable habitat (e.g. Huachuca water umbel) and/or because Rancho Seco is well outside the known distribution of the species (e.g. acuña cactus).



Photo 15. The Rancho Seco headquarters and vehicle storage facilities.



Photo 16. A windmill and water tank on Calera Wash. Though not clearly visible in the photo, there is a small adobe building behind and to the right of the tank.



Photo 17. The Montañío Ranch headquarters surrounded by livestock fencing.



Photo 18. The Cerro Colorado Mine.

County acquisition of the lands at Rancho Seco could potentially benefit as many as nine Priority Vulnerable Species. Large stock tanks, such as Fernstrom Tank, that represent almost permanent aquatic habitat could potentially be used as refugia for such species as the Chiricahua Leopard Frog. Similarly, the concrete stock tank at Montaña Ranch could be used to maintain a small population of Gila Topminnows (*Poeciliopsis occidentalis*). Additional searches for Pima pineapple cactus should also be undertaken at Rancho Seco. EPG biologist E. Linwood Smith looked for Pima pineapple cacti while conducting site reconnaissance on 21 January 2005, but found none along any of the numerous roads he drove on that day.



Photo 19. An abandoned pick-up truck on Calera Wash just northwest of the Arivaca Road.

REFERENCES CITED

- Alsop III, F. J. 2001. Birds of North America – Western region. DK Publishing, Inc., New York. 752 p.
- American Ornithologists' Union. 1998. The AOU checklist of North American birds. 7th edition. American Ornithologists' Union, Washington, D.C. 829 pp.
- Arizona Bureau of Mines. 1960. Geologic map of Pima and Santa Cruz Counties, Arizona. Map 1:375,000.
- Arizona Game and Fish Department (AGFD). 2004. Arizona's heritage data management system. Internet site, updated January 2003. http://www.gf.state.az.us/frames/fishwild/hdms_site/Home.htm. Accessed February 2004.
- _____. 2001. *Rana chiricahuensis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 p. Internet site: http://www.azgfd.com/w_c/edits/documents/Ranachir.fi.pdf. Accessed February 2004.
- Arizona Rare Plant Committee. Undated. Arizona rare plant guide. No pagination.
- Behr, C.J. 1995. Human impacts on the grasslands of southeastern Arizona. Pp 230-264 in M.P. McClaran and T.R. Van Devender, Eds. The desert grassland. Univ. of Ariz. Press, Tucson 346 pp
- Biota Information System of New Mexico (BISON). 2004. Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae* species account. BISON Internet site http://www.fwie.vt.edu/states/nmex_main/species/050065.htm. Accessed February
- Cockrum, E.L. and Y. Petryszyn. 1991. The long-nosed bat, *Leptonycteris*: an endangered species in the southwest? Occasional Papers, The Museum, Texas Tech University, No. 142.
- Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, P.A. Rabie and B.R. Euliss. 1999 (revised 2001). Effects of management practices on grassland birds: burrowing owl. Northern Prairie Wildlife Research Center, Jamestown, ND. 33 p.
- Degenhardt, W.G., C.W. Painter and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque, New Mexico. 431 p.
- deVos, J.C., Jr. 1998. Burrowing owl. Pp. 166-169 in Glinski, R. L. (ed.). The raptors of Arizona. Arizona Game and Fish Department. University of Arizona Press, Tucson. 220 p.

- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. *Birds in jeopardy*. Stanford University Press, Stanford, CA. 259 p.
- _____. 1988. *The birder's handbook, a field guide to the natural history of North American birds*. Simon & Schuster, New York. 785 p.
- Glinski, R. L. and R. S. Hall. 1998. Swainson's Hawk. Pp. 92-95 in Glinski, R. L., Ed. *The Raptors of Arizona*. Arizona Game and Fish Department. University of Arizona Press, Tucson. 220 p.
- Hendricks, D.M. 1985. *Arizona soils*. University of Arizona Press, Tucson. 244 pp.
- Hjertaas, D., S. Brechtel, K. De Smet, O. Dyer, E. Haug, G. Holroyd, P. James and J. Schmutz. 1995. *National recovery plan for the burrowing owl*. Report No. 13. Ottawa: Recovery of Nationally Endangered Wildlife Committee. 33 p.
- Hoffmeister, D.F. 1986. *Mammals of Arizona*. University of Arizona Press. Tucson, Arizona. 602 p.
- Nabhan, G.P., J.P. Floyd, P. West, B. Terkanian, C. Baptista, T.R. Van Devender, C. Ivanyi, L.E. Stevens, P. Siminski, P.C. Rosen, S. Buchmann, Y. Petryszyn, G. Bradley, C. Olson, D. Hendrickson, R. Aalbu, A. Mead, and D. Blinn. 2002. Naturalized exotic species in the Sonoran region. Appendix C. pp 356-365 in Barbara Tellman, ed., *Invasive exotic species in the Sonoran region*. Arizona-Sonoran Desert Museum, Tucson. 424 pp.
- National Geographic Society. 2002. *Field guide to the birds of North America*. Third Edition. National Geographic Society, Washington, D.C. 480 pp.
- Phillips A.R. 1968. *Aimophila carpalis carpalis* (Coues) Rufous-winged Sparrow pp.902-930 in Oliver L. Austin, Jr. ed. *Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies*. Part 2. Smithsonian Institution, United States National Museum, Washington, D.C. 645 pp.
- Pima County. 2004. *Draft Pima County multi species conservation plan appendices, Section C. Priority vulnerable species: analysis and review of the species proposed for the SDCP368 pp. + Appendices*
- _____. 2002a. *Priority biological resources of the Sonoran Desert Conservation Plan*. Map.
- _____. 2002b. *Special elements Sonoran Desert Conservation and Comprehensive Plan*.
- Sogge, M. K., R. M. Marshall, S. J. Sferra, and T. J. Tibbitts. 1997. *A Southwestern Willow Flycatcher natural history summary and survey protocol*. Technical Report NPS/NAUCPRS/NRTR-97/12. U.S. Department of the Interior, National Park Service, Colorado Plateau Research Station.

- Stebbins, R.C. 2003. A field guide to western reptiles and amphibians. Third Edition. Houghton Mifflin Co., New York, NY 531 pp.
- Terres, J.K. 1980. The Audubon Society encyclopedia of North American Birds. Alfred A. Knopf, New York. 1109 pp.
- Tucson Audubon Society. 2004. Finding birds in southeast Arizona. Tucson Audubon Society, Tucson, Arizona 329 pp.
- U.S. Fish and Wildlife Service. 2003. Internet site: http://endangered.fws.gov/50cfr_animals.pdf. Accessed: February 2004.
- _____. 1988. Endangered and threatened wildlife and plants; determination of endangered status for two long-nosed bats. Federal Register 53:38456-38460.
- U.S. Fish and Wildlife Service. 1995. Lesser Long-nosed Bat recovery plan. USFWS, Phoenix, Arizona, May 1995. 55 pp
- _____. 2000a. Cactus Ferruginous Pygmy-owl survey protocol. January 2000.
- _____. 2000b. Recommended guidance for private landowners concerning the Cactus Ferruginous Pygmy-owl. March 2000.
- United States Geological Survey. 1981. Saucito Mountain, Arizona. Map 1:24,000.
- _____. 1979a. Arivaca, Arizona. Map 1:24,000.
- _____. 1979b. Cerro Colorado, Arizona. Map 1:24,000.
- _____. 1979c. Las Guijas, Arizona. Map 1:24,000.

APPENDIX A

PHOTOPOINT UTMS

**UTM Coordinates (NAD 27) for Rancho Seco Photopoints
Used in This Document**

Photograph No.	Northing	Easting
1	3502322	0469649
2	3502322	0469649
3	3503294	0474879
4	3504196	0472767
5	3504136	0479563
6	Not Recorded	Not Recorded
7	3503294	0474879
8	3497770	0469977
9	Not Recorded	Not Recorded
10	3502948	0472103
11	Near 351816	Near 0467568
12	Not Recorded	Not Recorded
13	3504562	0472894
14	3501691	0466772
15	3505151	0472521
16	3500022	0470599
17	3501816	0467568
18	3502638	0473868
19	3499383	0471107