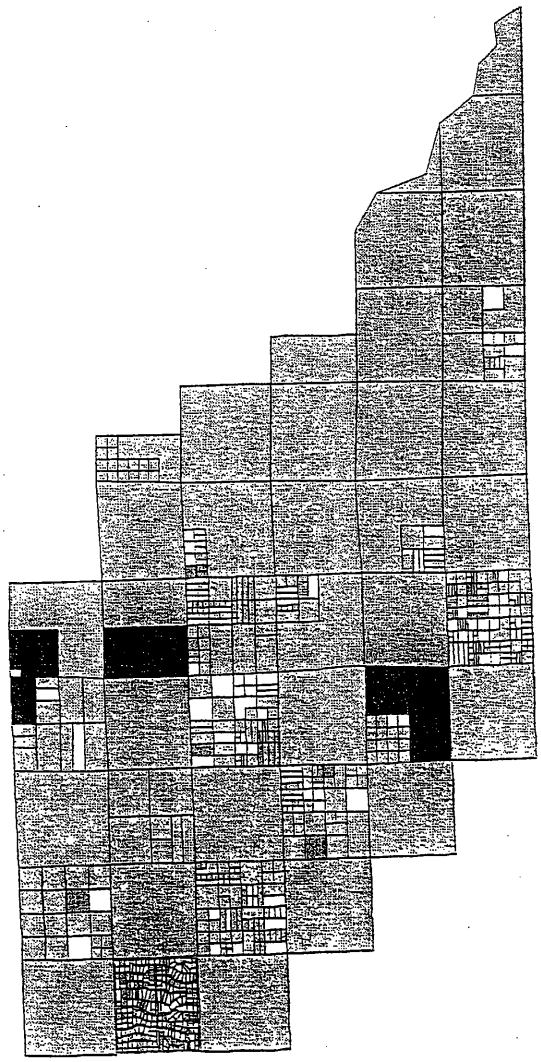
APPENDIX E
2003 DESERT TORTOISE PRESERVE COMMITTEE MANAGEMENT PLAN, DESERT TORTOISE NATURAL AREA & ADJACENT LANDS

Desert Tortoise Preserve Committee
Management Plan
Desert Tortoise Natural Area & Adjacent Lands



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Desert Tortoise Preserve Committee
2002

Desert Tortoise Preserve Committee
Management Plan
Desert Tortoise Natural Area & Adjacent Lands

TABLE OF CONTENTS

Page

DTPC MISSION & ACKNOWLEDGMENTS ii

1. INTRODUCTION & PURPOSE 1-1
   - Figure 1. Location of the DTNA and Schematic Map Showing Sections 1-2
   - Figure 2. Progress In Land Management At the DTNA, 1977 and 2002 1-3

2. BACKGROUND 2-1
   - A. Desert Tortoise Natural Area 2-1
   - B. History of Land Acquisition at the DTNA 2-1
   - C. DTNA Expansion Proposals and Land Acquisition 2-2
   - D. Stewardship 2-3
   - E. Research 2-3
   - F. Education & Visitation 2-4
     - Figure 3. Spring Visitation at the DTNA, 1989-2002 2-4

3. EXISTING SITUATION 3-1
   - A. Resources 3-1
     - 1. Biological Resources 3-1
     - 2. Land base 3-2
     - Figure 4. Land Ownership Within the DTNA 3-3
     - Figure 5. DTPC Landholdings in the DTNA Expansion Area 3-5
   - B. Threats to the tortoise and its habitat 3-4
   - C. Land acquisition priorities 3-10
     - Figure 6. Prioritized Land Acquisition Zones Around the DTNA 3-11

4. GOALS & OBJECTIVES 4-1

5. REFERENCES 5-1

6. APPENDICES

   - Appendix A Agreements under which DTPC has acquired land in the DTNA area
   - Appendix B Desert Tortoise Natural Area Activity Report form
   - Appendix C Inventory Of Vertebrate Species

Desert Tortoise Preserve Committee

Founded 1974

MISSION

The Desert Tortoise Preserve Committee was founded in 1974 to (a) promote the welfare of the California State Reptile, the Desert Tortoise (*Gopherus agassizii*) in its native wild state in the southwestern United States; (b) establish and/or assist in establishment of Preserves for the Desert Tortoise in locations within the southwestern United States where there are habitats and ecosystems which support it; (c) provide information, education and research regarding ecosystems critical to the Desert Tortoise and to associated animal and plant species that may be included in these ecosystems; (d) develop and implement management programs for preserves, including other land associated with any preserve, to protect the Desert Tortoise and the biodiversity of the ecosystems in which it lives; and (e) foster and to publicize the uses for these preserves for selected forms of recreation, for education, for conservation and for research.

ACKNOWLEDGEMENTS

We gratefully thank the following for their contributions to this document and to the Committee's work:

Dr. Matthew Brooks; Mary Ann Henry; the West Mojave Planning Team for providing GIS data; Drs. John Harris and Phil Leitner for their reports on the Mohave ground squirrel; the Field Manager and resource staff of the Bureau of Land Management's Ridgecrest Field Office; Becky Jones, California Department of Fish & Game; current and former members of the DTPC Board of Trustees; the DTPC Naturalists and DTPC contractor Jun Lee; and DTPC's many volunteers, members and supporters.

1. INTRODUCTION AND PURPOSE

A. Introduction

The Desert Tortoise Preserve Committee (DTPC) was founded in 1974 to promote the welfare of the desert tortoise (*Gopherus agassizii*) in its native wild state by establishing preserves for the tortoise and associated animal and plant species in desert tortoise critical habitat, by developing and implementing management programs for tortoise preserves and adjacent land, by providing information, education and research, and by fostering the use of preserve lands for selected forms of recreation, for education, and for research.

Since its inception, the Committee has centered its activities on the Desert Tortoise Research Natural Area (DTNA). Located in southeastern Kern County, California (figure 1) this 39.5 square mile preserve historically included the highest density tortoise population in the United States. Initially, the Committee worked to fence the DTNA boundary and then to ensure the acquisition of the 16 square miles of private inholdings that were extent when the preserve was designated. The Committee has been extremely successful in this endeavor, and over 88% of the private inholdings have been acquired (see figure 2). The Committee's current focus is shifting towards expanding the DTNA to better achieve the precepts of tortoise reserve design laid down in the U.S. Fish and Wildlife Service's 1994 *Desert Tortoise (Mojave Population) Recovery Plan*. An expanded DTNA will play an increasingly significant role in desert tortoise and Mohave ground squirrel conservation.

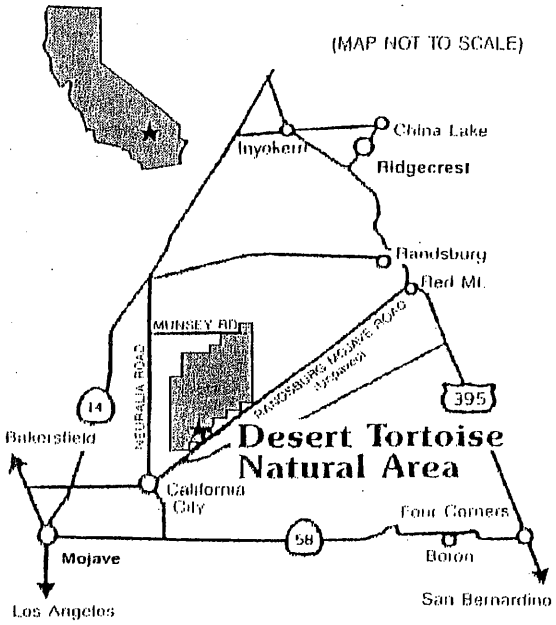
The DTNA is managed under the 1988 *Sikes Act Management Plan for the Desert Tortoise Research Natural Area and Area of Critical Environmental Concern*. The Bureau of Land Management and the DTPC are responsible for most of the on the ground management. Coordination meetings have been held annually for the last decade during which management is candidly reviewed and assessed, and management modified as required.

B. Purpose

The Committee seeks to manage the land in and around the DTNA to enhance the recovery of the desert tortoise and the Mohave ground squirrel in furtherance of its mission. The Committee has entered into mitigation agreements with various agencies to facilitate funding for such management.

The purpose of this plan is to provide a management framework for the DTPC as it works with other agencies to conserve habitat for the desert tortoise and Mohave ground squirrel, and to enhance the recovery of these and other threatened and sensitive species. Developed from concepts of rational reserve design strategy and management guidelines laid down in the USFWS 1994 *Desert Tortoise (Mojave Population) Recovery Plan*, this management plan describes the preserve location, area and design, and proposes interim and long-term management actions designed to enhance and maintain the habitat for the benefit of its desert tortoise population and other inhabitants of this western Mojave ecosystem particularly the Mohave ground squirrel.

Figure 1. Location of the Desert Tortoise Natural Area and Schematic Map Showing Sections



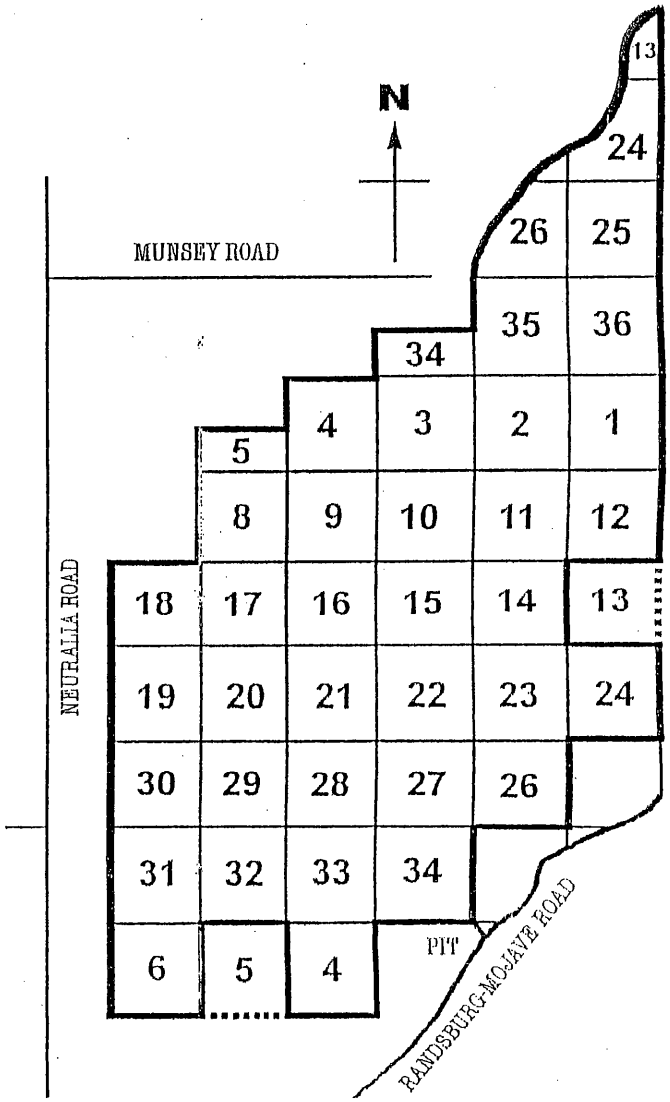
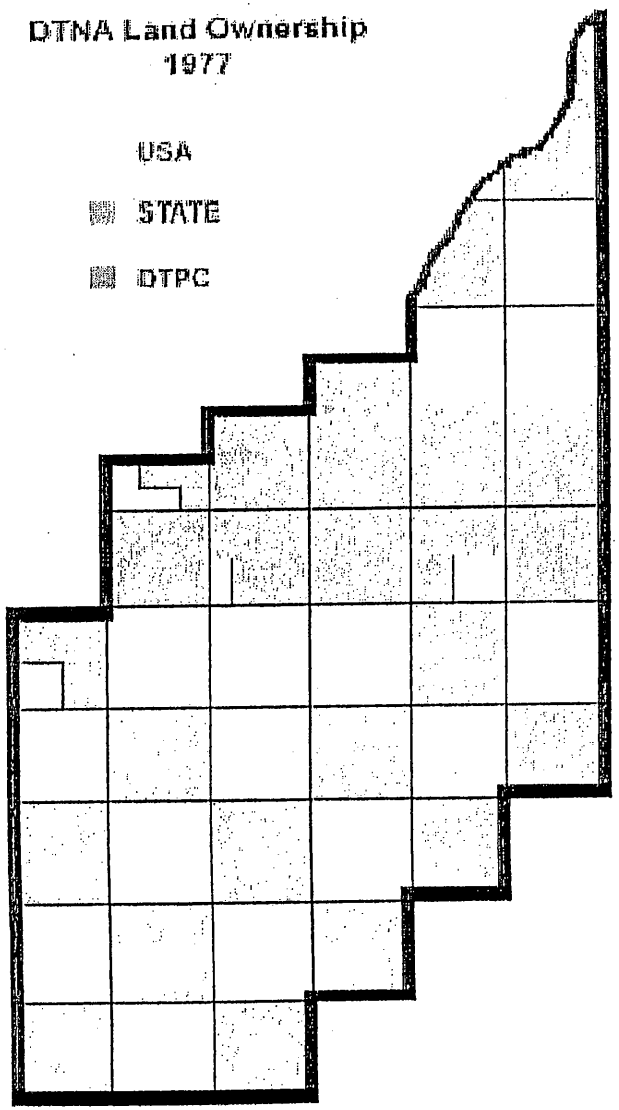
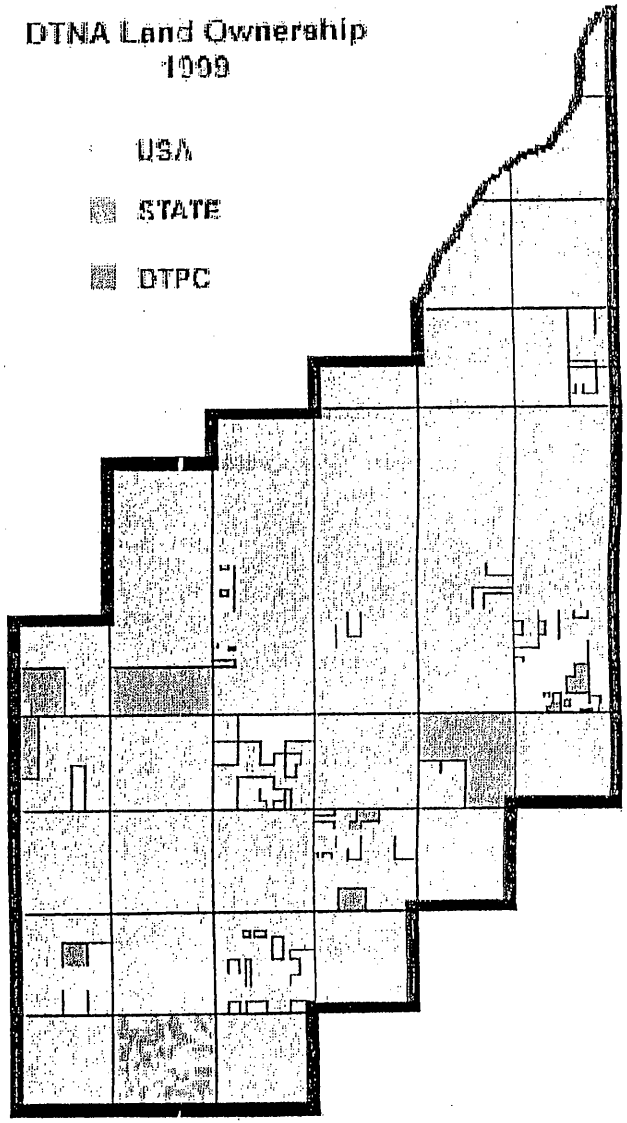


Figure 2. **Progress In Land Acquisition At the Desert Tortoise Natural Area, 1977-2002**





2. BACKGROUND

A. Desert Tortoise Natural Area

Useful summaries of the history of the formation of the DTNA can be found in Forgey, 1976 and in the 1988 Sykes' Act Management Plan (Bureau of Land Management and California Department of Fish & Game, 1988). The following brief summary was compiled from these sources and from DTPC files.

Strong public support to establish a sanctuary or preserve for the desert tortoise in the area north of California City and south of Koehn Dry Lake lead the Bureau of Land Management to establish a "Desert Tortoise Preserve" in the November, 1973 Interim Critical Management Plan for recreation vehicle use in the California Desert (Bureau of Land Management, 1973). The plan designated a vehicle closure for the "Desert Tortoise Preserve" and called for vehicle closure signs to be installed around the perimeter. Public support coalesced over the need for a larger preserve that would be protected with a boundary fence, and on April 2, 1974, the Desert Tortoise Preserve Committee was formed with these goals in mind. In 1975, the Bureau filed an application to with the Secretary of the Interior to withdraw 12,000 acres of public land from mineral entry to establish the Desert Tortoise Natural Area. In 1976 the Bureau set the Natural Area at its present size of 39.5 square miles (25,290 acres) (Bureau of Land Management, 1976). Of that, 8,860 acres were in private ownership.

B. History of Land Acquisition in the Desert Tortoise Natural Area

In 1978, the DTPC associated as a project committee with The Nature Conservancy (TNC) to join forces in land acquisition. The DTPC took the lead in raising funds for land acquisition, and the TNC in turn provided their expertise in negotiation and purchase of the properties from the landowners and in holding the properties. As the Desert Tortoise Preserve Committee began to develop its own in-house acquisition expertise it took on more of the negotiation and acquisition activities. By 1991, both the TNC and DTPC agreed that the partnership was no longer needed and the TNC ended its role at the DTNA.

The initial strategy employed by the two non-profit entities was to acquire properties and then sell or exchange them to a public agency, such as BLM. The money raised in the sale would then be used to purchase additional private lands in the Natural Area (Monsko, 1989). Table 1 summarizes the history of acquisition of private inholdings in the Natural Area. In 1980, the BLM acquired 1580 acres in Sections 15, 17 and 29 through a land exchange. In 1986, the DTPC joined with TNC and the Department of Fish and Game Wildlife Conservation Board to buy 948 acres in Sections 17, 18 and 23, the largest holding in single ownership. In 1987 a coalition of conservation organizations, including the Defenders Of Wildlife, petitioned Congress for a Land and Water Conservation Fund appropriation for the BLM in fiscal year (FY) 1988. The efforts paid off when Congress appropriated $600,000, of which $500,000 was earmarked for the DTNA and the remainder went to the Chuckwalla Bench Area of Critical Environmental Concern. In FY89 through all the conservationists' efforts, Congress appropriated

Table 1: History of Land Acquisitions at the DTNA

	Acres				
Year	DTPC/TNC*	BLM	CDFG	Private Lands Acquired	Comments
1977	160			160	
1978	1280			1280	
1980		1580		1580	Land exchange
1981	40			40	
1984	68			68	
1985	10			10	
1986	30		948	978	
1987	20			20	**Congress petitioned for Land and Water Conservation funds
1988	271	[1560], 260		534	1560 acres was acquired from TNC/DTPC using Land and Water Conservation funds.
1989	305	117		462	
1990	68	[604], 519	2.5	589.5	604 acres acquired from TNC/DTPC; 2.5 acres transferred to CDFG by DTPC
1991	7	113.5		120	
1992	91	52.5		143	
1993	7			7	
1994	7			7	
1995	36			36	
1996	46			46	
1997	19			19	
1999	2.4			2.4	
2001	65	[30]		65	BLM acquired a 30 acre parcel from DTPC that had been acquired in 1996 to facilitate clearing a clouded title by agreement with BLM.
2002	25			25	
TOTAL				6189.4	
As of spring 2002,1657 acres is left in private ownership within the DTNA boundary					

*Between 1976 and 1991, the DTPC was a project committee of The Nature Conservancy. The DTPC raised funds for land acquisition at the DTNA and The Nature Conservancy provided its real estate and management expertise. This relationship ended in 1991 once the DTPC had developed its own land acquisition and management capacity.

**In 1987 a coalition of conservation organizations lead by Defenders Of Wildlife, petitioned Congress for a Land and Water Conservation Fund appropriation for the BLM in fiscal year 1988. Congress earmarked $500,000 for land acquisition at the DTNA.

another $2.3 million for the two. To carry out their program the BLM added realty experts to two offices and formed a coordinating group consisting of representatives from the Kern County Planning Department, California Department of Fish and Game, DTPC and TNC with the intent of avoiding duplication of efforts and to present a consistent picture to the landowners.

DTPC became active in tortoise mitigation and compensation for development projects in the desert in early 1988. DTPC received funds from LUZ Engineering Corporation as part of the required compensation for a solar electric generating plant at Kramer Junction 160 acres were purchased in Section 36 and subsequently sold to the BLM. The Committee also received compensation funds from Kerr-McGee Corporation for a cogeneration plant in Searles Valley and purchased 40 acres in Section 27. This experience allowed the DTPC to act as the mitigation agent in the Yucca Valley Churches HCP and acquire 5 acres of replacement habitat in section 27 at the DTNA. This was the federal 10(a)(1)(b) permit issued in California for the lawful take of desert tortoises (La Rue, 1994). A list of similar agreements governing land in and around the DTNA can be found in Appendix A.

DTPC also uses grant funding to buy habitat at the DTNA, including a $100,000 grant from the Wildlife Conservation Board in 1989.

C. Desert Tortoise Natural Area Expansion Proposals and Land Acquisition

In its discussion of tortoise reserve design, the *Desert Tortoise (Mojave Population) Recovery Plan* (section II 5) specifies the importance of minimizing the perimeter to area ratio, that interconnected blocks of habitat are better than isolated blocks, and that linkages function better when the habitat within them is represented by protected, preferred habitat for the target species. An additional relevant criterion is the ability to use readily defensible boundaries such as roads where it is more practical to build fences and other barriers without degrading additional habitat.

In 1987, the Committee submitted a proposal to the Bureau of Land Management for a major expansion of the Natural Area to include tortoise habitat in the adjacent Western Rand Mountains ACEC and approximately 20 square miles of private land holdings east, west and north of the DTNA. This included expansion of the southeast boundary to meet the Randsburg Mojave Road with the eventual goal of constructing a fence along that road "to keep in the tortoise and keep out sheep, ORV's, dogs etc. Development and recreation pressures will mandate a secure barrier in then future." [Proposal submitted to Ed Hastey, Director California State Office, Bureau of Land Management, September 1987]. This proposed enlargement was not fully endorsed by the Bureau at the time because of the "logistical nightmare" of the acquisition effort and the need to more fully meet acquisition goals in the DTNA; endorsement would be reconsidered when the DTNA acquisition goals have been more fully met and when "the efforts of a third party" have reduced the number of parcels in need of acquisition. (letter to the DTPC from BLM State Director Ed Hastey, reference 6840 CA-063.14, December 1, 1987).

In 1992, the Committee received a gift of 188 acres of habitat in the proposed expansion area just south of the DTRNA boundary. This opportunity lead the Committee to launch its own

southeastern "DTNA buffer zone" program which targeted sections 25, 35, and 36 to the immediate south east of the boundary. The DTPC currently manages 660 acres of land in sections 25 and 35. The DTPC has recently acquired over 2,000 acres in the DTNA expansion areas to the east and west of the current boundaries. The Bureau's West Mojave Planning effort has included the "buffer zone" and "eastern expansion" areas within the boundary of the proposed Fremont-Kramer Desert Wildlife Management Area.

D. Stewardship

In December 1986, the DTPC signed a Cooperative Management Agreement with the BLM for the management of the Natural Area. This formalized the working arrangements that had been ongoing for many years for perimeter fence repair, signage, managing visitation, updating the Habitat Management Plan, etc. The DTPC organizes regular work parties to remove trash, and to maintain trails, the interpretive center, fencing and other infrastructure. Since 1989, the DTPC has staffed a Naturalist at the Interpretive Center each spring to provide security and monitoring of visitors. DTPC staff and volunteers make regular fence patrols and coordinate these with the BLM Ranger where possible. Stewardship activities are recorded on the *Desert Tortoise Natural Area Report* form (Appendix B) and the reports are kept on file in the DTPC's Riverside Office.

E. Research

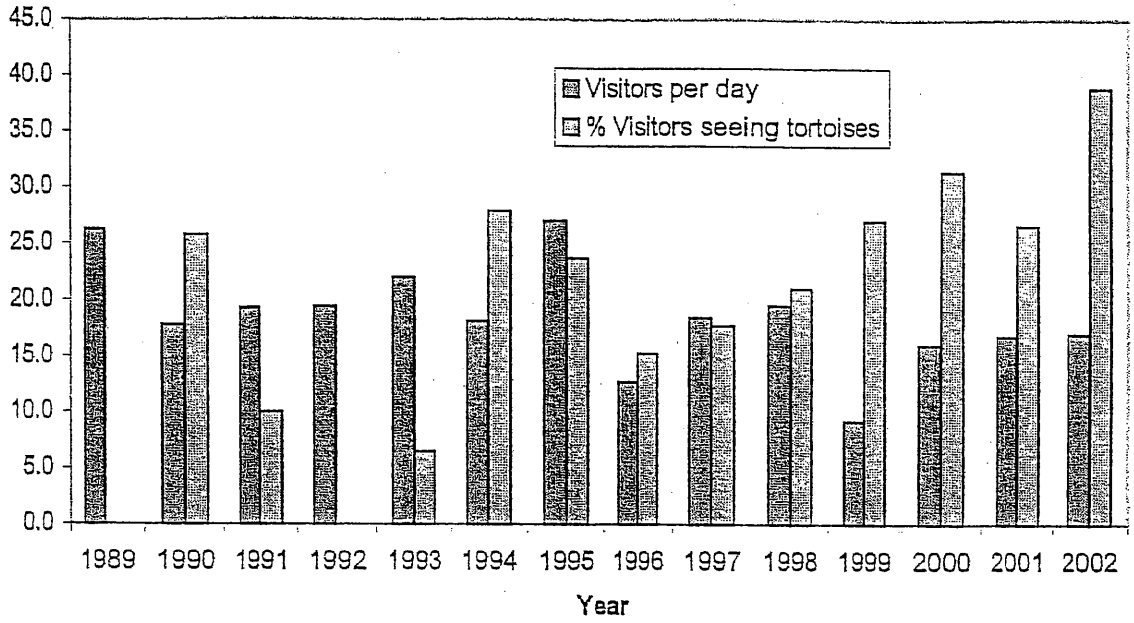
The DTNA has provided critical information for understanding desert tortoise (*Gopherus agassizii*) ecology, physiology, health, and behavior (Connor & Berry, 2000). Since 1973, research projects conducted at the DTNA have played an important role in identifying major issues for the desert tortoise such as: tracking population dynamics and the catastrophic declines; discovery of upper respiratory tract disease; quantifying physiological and reproductive adaptations to drought and abundant precipitation; establishing plasma and biochemical reference ranges; developing protocols for field handling techniques; identifying forage patterns and preferences; documenting the impacts of raven predation on juvenile tortoises; and describing the protective effects of preserve fencing in regards to livestock grazing and off-road vehicles. For the past 26 years, the approach has been for integrative scientific research with each project drawing on the others. The DTNA has provided biologists and land managers with valuable lessons for design and management of reserves for the recovery of tortoise populations in the Mojave and Colorado deserts. Management issues such as disease, raven predation, invasion and establishment of alien plant species and encroaching urban interfaces are at a landscape scale.

The DTPC has initiated and funded various research projects at the DTNA and has been instrumental in securing funding to ensure that tortoise surveys are conducted on the DTNA's two permanent study plots. The Committee has also been successful in raising funds for essential research on the state-listed Mohave ground squirrel.

F. Education & Visitation

The Committee designed the educational materials portrayed on the kiosk panels at the DTNA Interpretive Center, and designed the layout of trails. The Interpretive Center has become the central point for visitors to the Natural Area. This ensures that visitors and their potential impacts are more easily managed. The DTPC has staffed a naturalist at the Interpretive Center each spring since 1989. The naturalists monitor visitation, and provide educational and interpretive services. The presence of a naturalist who can provide useful information on the tortoises and other wildlife provides an additional incentive for visitors to begin their visit at the Interpretive Center. Figure 3 shows spring visitation and sightings of tortoises by visitors between 1989 and 2002 (from Connor, 2002).

Figure 3. Spring Visitation at the DTNA, 1989-2002



3. EXISTING SITUATION

A. RESOURCES

1. Biological Resources

The 1988 ACEC Plan provides a detailed account of the resources within the DTNA (Bureau of Land Management 1988), and the *Desert Tortoise (Mojave Population) Recovery Plan* (FWS, 1994) provides a useful synopsis of tortoise biology.

Tortoise density estimates on the Interior and Interpretive Center study plots performed since 1988 (most recently in spring 2002) indicate that numbers of adult tortoises have continued to decline, but the number of tortoises inside the fence-line is significantly higher than outside the fence-line (Berry, data in preparation). A significant number of juvenile and young tortoises were found on the Interpretive Center plot, indicating that recruitment is occurring. However, the continued loss of adults remains a serious problem.

In 1990, section 8 in the DTNA adjacent to the Honda Test Track was subdivided into 4 quadrants with tortoise fencing for an experimental relocation study (Weinstein, 1991). The section 8 site was resurveyed in 1998 by CDFG and DTPC personnel. The survey team located 30 live and 33 dead tortoises (Hoover, Memorandum to K. Berry dated August 13, 1998) indicating that a die-off had occurred in this location since the completion of the relocation study in 1991. The 1979 Desert Tortoise Natural Area Habitat Management Plan identified section 19 and 31 on the western boundary of the DTNA as "Land comprising the best known tortoise habitat". Section 30 which lies on the western boundary between section 19 and 31 was the site for study of energetics in the desert tortoise (Marlow 1979). Surveys by BLM filed investigators located 161 tortoises on the section 30 in 1979, and 151 in 1980 (Bureau of Land Management, 1988). Additional tortoise surveys have been conducted at the DTNA in recent years as part of the preparations for the West Mojave Plan and in the FWS range-wide line-distance sampling survey but quantitative data has not been made available.

DTPC is working to develop a head-starting protocol that could potentially be used to accelerate recovery of the tortoise at the DTNA. Head-starting chelonians is controversial, and there is little data available that demonstrates that such a program could usefully augment desert tortoise recovery (see Morafka et al., 1997). A suitable site for head-starting research would in the Honda relocation site at section 8. This is relatively remote (vandalism is potentially a very serious issue for any long-term project), has already been the site of previous manipulations, and has been fenced into 4 quadrants that may be valuable for controlled studies.

Recent surveys (2000) supported by the DTPC and sightings by the naturalists indicate the continued presence of Mohave ground squirrels (*Spermophilus mohavensis*) at the Natural Area (Leitner, 2001; Connor, 2000). Other notable species observed in recent years by the DTPC naturalists, volunteers and BLM biologists include the westernmost sighting of a Sonoran metalmark butterfly (*Apodemia mejicanus*), burrowing owls (*Athene cunicularia*), Bendire's

Thrasher (*Toxostoma bendirei*), Loggerhead shrikes, *Lanius ludovicianus*, Le Conte's thrasher, *Toxostoma lecontei*, and ospreys (*Pandion haliaetus*).

Although impoverished in some areas because of human activity, the DTNA buffer zone and expansion areas have similar biological assemblages to that found in the DTNA. The DTNA perimeter fence was designed to allow unimpeded transit of small animals, and tortoises regularly move in and out of the designated ACEC area. Tortoises may be encountered throughout the buffer area even in the heavily denuded, high OHV activity area located by the Randsburg Mojave Road in section 3.

An inventory of vertebrate species anticipated to occur in the DTNA and in the proposed expansion areas is provided in Appendix C.

2. Land base

The land ownership pattern within the existing DTNA boundary is shown in figure 4 and summarized in tables 2 and 3 below. Federal and California state agencies hold approximately 23,059 acres. The DTPC owns 389 acres. About 1,657 acres remain in private hands.

Table 2. DTNA Land Ownership as of Spring 2002

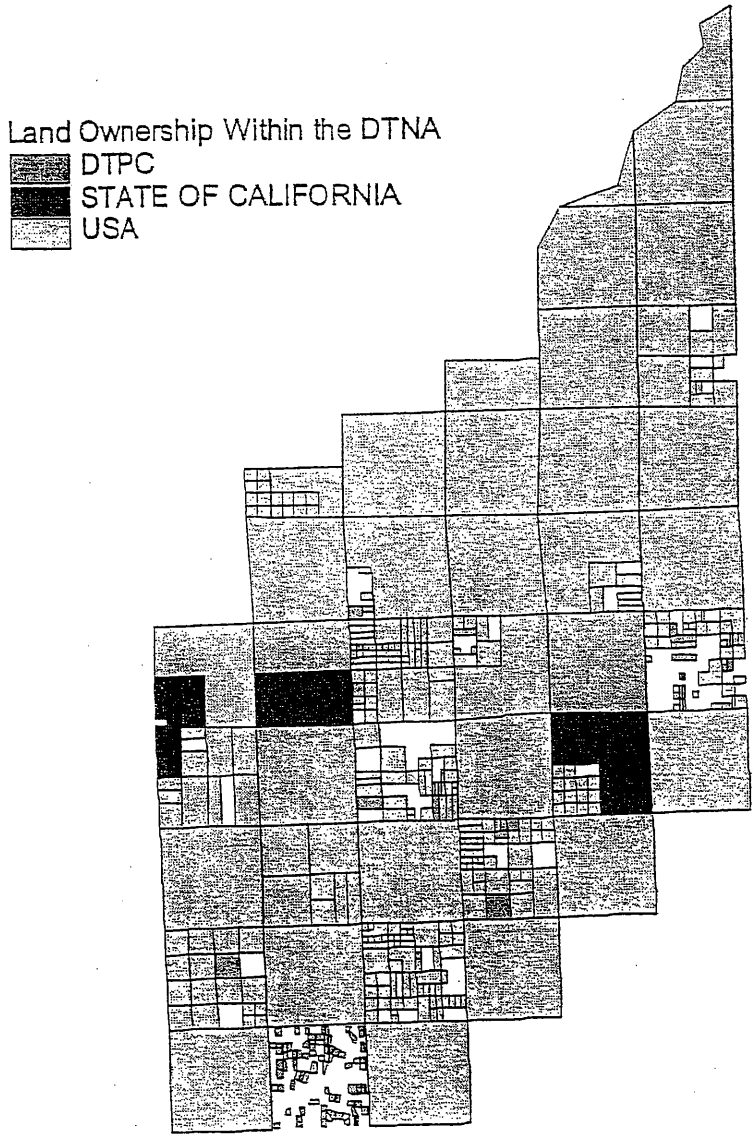
Entity	Acres
USA (BLM)	22,034
State of California	1,025
DTPC	389
Private	1,657
Total	25,105

The 1,657 acres of private land is divided among 295 parcels. The bulk of these parcels are in section 5 and section 13 (Table 3).

Table 3. Distribution of Private Landholdings Within the DTNA as of Spring 2002.

Township	Section	Acres	Number of Parcels
T30S R38E	36	100	7
T31S R38E	9	50	7
	11	50	4
	13	334	64
	15	55	6
	16	27	5
	18	5	1
	19	60	2
	21	263	22
	23	20	2
	27	98	8
	31	81	2
	33	147	18
T32S R38E	5	365	147

Figure 4. Land Ownership Within the Desert Tortoise Natural Area



The DTPC has been working with the State of California, local governments, public agencies, private companies and other nonprofit organizations to conserve additional habitat outside the existing perimeter of the DTNA. Figure 5 shows the distribution of these acquisitions around the DTNA. The DTPC holds 555 acres (31 parcels) west of the DTNA, protecting the high value habitat in sections 19, 30, and 31; it holds or manages 818 acres (13 parcels) southwest of the DTNA in the crucial buffer zone between the DTNA and the Randsburg-Mojave Road; and it holds 1119 acres (23 parcels) on the eastern side of the DTNA that protects the western boundary and forms a significant link towards the rest of the tortoise population in the Fremont-Kramer critical habitat unit. A list of agreements and associated acreage can be found in Appendix A.

B. THREATS TO THE TORTOISE AND ITS HABITAT

The Desert Tortoise Recovery Plan lists and discusses 19 types of threat to the desert tortoise (FWS, 1994 Appendix D). This section reviews those threats relevant to the tortoise and its habitat at the DTNA and surrounding area. While these threats are categorized for convenience, they are often interrelated, are cumulative and deserve consideration as such.

1. Deliberate Tortoise Removal, Release And Translocation

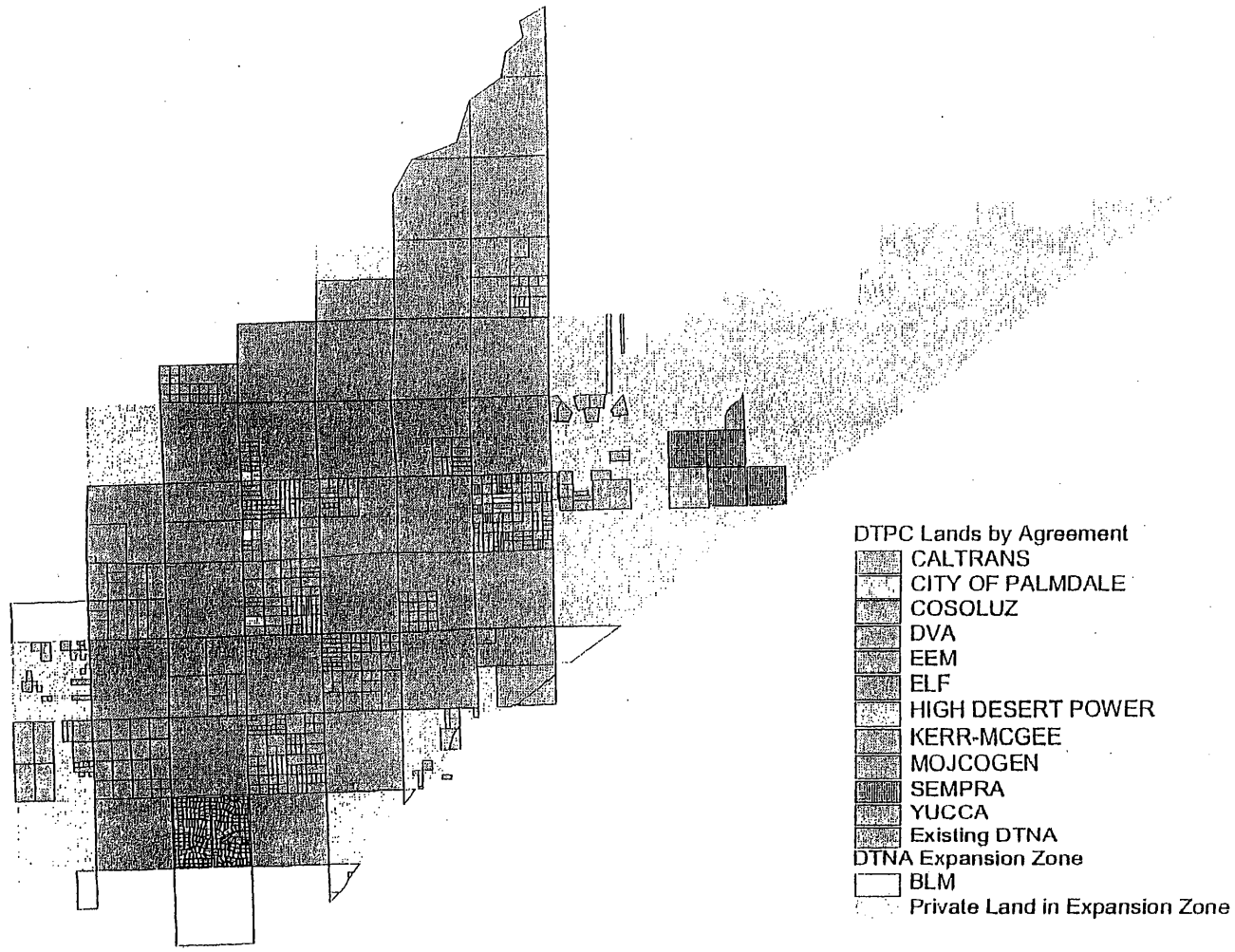
As the Recovery Plan documents, prior to the 1960s, large scale, deliberate removal of tortoises for the pet trade occurred in the region. Sporadic episodes of tortoise removal either for pets or as food items have been reported, including interceptions by DTPC personnel stationed at the DTNA. There have been no documented removals of live animals from the DTNA in recent years but the naturalists have intercepted the removal of carcasses. While this of little direct threat to the population potentially valuable information relating to life history and causes of death may be lost.

Release of tortoises at the Natural Area is an issue. Desert Tortoise Preserve Committee Naturalists at the DTNA have intercepted people in the process of releasing captives and discovered recently released captives (Howland 1989, Ginn 1990, and Jennings 1991). Howland (1989) reported illegal releases and an attempted release of five desert tortoises, three of which showed signs of URTD. Jennings (1991) recorded two such instances. In recent years, the naturalists have prevented the release of tortoises found on distant roads by off-highway vehicle enthusiasts who believe that the tortoises either belong in the DTNA or would be better off there. Connor 2002 reported the interception of the release of a red-eared slider (*Trachemys scripta elegans*) that was driven to the DTNA after being found at the side of a freeway near Barstow.

2. Vandalism, Trash And Balloons

Shooting and vandalism play a major role in losses of desert tortoises in many areas, particularly where human visitor-use is high (FWS, 1994). Target shooting is not allowed in the DTNA but does occur on land around the DTNA and signs along the boundary are frequently riddled with bullet holes.

Figure 5. DTPC Land Holdings In the DTNA Expansion Area, 2002



The Recovery Plan documents the impacts that trash, balloons and other foreign objects can have on the tortoise including death and injury through ingestion and entanglement (FWS, 1994). Balloons are frequently found on the DTNA.

3. Roads And Off-Highway Vehicle Recreation

The negative impacts of roads on desert tortoise populations are well documented in California, and busy roads can deplete tortoise numbers for several kilometers on either side (FWS, 1994). The Recovery Plan list of impacts from ORV use is extensive, including: mortality of desert tortoises on the surface and below ground; collapsing of desert tortoise burrows; damage or destruction of plants used for food, water, and thermoregulation; damage or destruction of the mosaic of cover provided by vegetation; adverse effects to the general well-being of desert tortoises through water balance, thermoregulation, and energy requirements; noise pollution; impact, damage or destruction of soil crusts; soil erosion; proliferation of weeds; and increases in numbers and locations of wild fires (FWS, 1994).

The area around the DTNA has long been a focus of OHV use (BLM, 1993) and abuse (Goodlett and Goodlett, 1991). The Rand Mountains region is popular with OHV enthusiasts and the private lands to the south as used as camping and staging areas. Camp "C", one of the more popular staging areas, is located in the eastern expansion area. Some illegal OHV use occurs on the DTNA as documented by DTPC fence patrols. Completed *Desert Tortoise Preserve Committee -- Desert Tortoise Natural Area Activity Report* forms (see Appendix B) frequently reference deliberate cuts and breaks in the fence line with clearly visible vehicle (usually motorcycle) tracks leading into the DTNA.

4. Mining

The Recovery Plan documents a variety of impacts, including: (1) cross-country travel by vehicles during the exploration phase; (2) construction of roads; (3) disturbance of the soil surface and vegetation for access to the mineral resources (shafts, mill sites, open pits, placer diggings, tailings, leach pits, etc.); (4) production of toxic products or byproducts; (5) development of small towns and settlements to support large mines; and (6) temporary (short- or long-term oil and gas leases) or permanent transfer of title of public lands to the private sector, and (7) refuse. The Federal lands within the Natural Area are withdrawn from mineral entry (see above) however this withdrawal does not protect the surrounding lands and active mining occurs in the Randsburg area to the northwest. Mining activities could be a source of wind or water borne contaminants. Elevated levels of metal toxicants have been found in livers and kidneys of some tortoises from the DTNA and other areas of California (Homer et al., 1996).

5. Grazing

Impacts from livestock grazing include trampling of animals, nests and habitat, competition for food, changes in soil and vegetation, and loss of cover (FWS, 1994). Livestock grazing was prohibited at the DTNA in 1978. However, even though livestock grazing is prohibited within the California City limits, bands of sheep are often herded down the

Randsburg-Mojave Road and may trespass on unfenced sections of the DTNA and the surrounding habitat.

6. Alien Plants

The number of alien plant species is increasing and some now dominate and negatively affect or threaten to affect ecosystem integrity in wildland areas of the Mojave desert (Brooks, in review). The most widespread and abundant species are the annuals *Schismus* spp., and *Erodium cicutarium* (Brooks and Berry 1999). Russian thistle is a problem at the DTNA (Bureau of Land Management, 1988) particularly on the western side along Cache Creek.

Established alien plant seedlings can inhibit the germination of desert annuals (Inouye, 1980; Inouye, 1991), and densely packed alien germinants may reduce subsequent germination of natives in the Mojave Desert. Reduced abundance and diversity of native annual plants can deprive desert tortoises of important forage. Effects may include reduced availability of preferred food plants, loss or reduction of available nutrients and trace elements, and change in seasonal availability of plant foods (Nagy et al., 1998; Brooks and Berry, 1999). Desert tortoises selectively graze native annual and herbaceous perennial plants, and in some cases they will eat exotic plants. At the DTNA, native plants comprised 95% of the desert tortoise diet (Jennings, 1993a, 1993b, 1997). The Mojave ground squirrel is often less abundant in areas dominated by alien annual plants compared to areas dominated by native species (Phil Leitner, personal communication). Alien annual grasses alter the fuel structure in the Mojave and Colorado deserts, making them more susceptible to frequent fires.

Invasions of new species often occur along roads and washes in the deserts of California (Brooks, 1998; Kemp and Brooks, 1999), so efforts to monitor the arrival of new species and eradicate them should be focused in these areas. *Brassica tournefortii*, a recently introduced mustard, is spreading along and outward from roads in the California deserts. This species fuels fire in coastal southern California and its capacity to produce large amounts of combustible biomass will likely do the same in the desert. Other disturbances such as livestock grazing and off-highway vehicle use also promote the dominance of alien annuals; protecting desert tortoise habitat from these and other forms of anthropogenic disturbances can minimize the biomass of alien annual plants (Brooks, 1998).

7. Fire

Fires appear to be historically uncommon in the Mojave Desert, but records from the Bureau of Land Management's California Desert District and Joshua Tree National Park indicate that the frequency of fire has increased since the 1970's. The increase in fire frequency is due partly to increased numbers of fires from human activity (FWS, 1994). Fires can kill animals directly by incineration, elevated body temperature, poisoning by smoke, or asphyxiation (Whelan, 1995). Fires that occur when desert tortoises are above ground and active are likely to affect populations the most, because individuals are most susceptible to mortality during this time. Fires can have enduring effects on desert tortoise populations, especially when they reduce the cover of perennial plants and abundance of native food plants. Perennial plants, especially woody shrubs, provide protection for desert tortoises from mortality due to predators or

overheating from the sun (Woodbury and Hardy, 1948; Burge, 1978). Although single fires may not produce long-term reductions in the cover of perennial plants or biomass of native annual plants (O'Leary and Minnich, 1981), recurrent fire typically converts native desertscrub to alien annual grassland (Brown and Minnich, 1986). This new habitat is much more prone to burning again, and recurrent burning will likely prevent the re-establishment of the native desertscrub that it replaces. Areas of recurrent fire therefore render habitat inhospitable for the desert tortoise.

8. Subsidized Predation

While many species of predators prey on desert tortoises, one of the most important predators at this time is the common raven (FWS, 1994). Ravens have been observed killing juvenile tortoises; large numbers of young tortoise remains show signs consistent with raven predation, such as puncture wounds and other openings in the shell; and large numbers of young tortoise remains are found in and at the base of raven nests, as well as near perches. Large numbers of ravens have been observed in the west Mojave and raven predation, which can threaten long-term persistence of tortoise populations, in that area is significantly higher than other areas. Populations there and elsewhere apparently are increasing. Ravens are common at the DTNA. The DTPC spring 2002 naturalist observed at least one raven on 86% of the days he was on duty (Connor, 2002). The *Recovery Plan* recognizes predation on adult tortoises by coyote (p. D32). Coyote are present at the DTNA. Both the raven and the coyote utilize human developments for water and food and can be categorized as "subsidized" predators.

Adult tortoises are at risk from attack by domestic or feral dogs, and most of the tortoises (live or dead) observed in the 2001 survey of the Fremont Valley permanent study plot bore signs of gnawing by canids (Berry, data in preparation). Feral or vicious domestic dogs have challenged DTPC personnel and other volunteers near the western boundary of the DTNA.

9. Disease

Berry, 1997 has reviewed the early occurrence of disease at the DTNA and subsequent developments. Disease was documented as a major cause of mortality in desert tortoise populations at the DTNA in 1988, when ill tortoises with upper respiratory disease were observed by field-workers at the DTNA Interior permanent study plot (Berry, 1990; Jacobson et al., 1991). Further research in 1989 and 1990 (e.g., Knowles, 1989; Berry, 1990) confirmed that many tortoises at the DTNA were ill, dying, or had recently died. The signs of disease (nasal discharge, lassitude, cachexia) were similar to signs that have been commonly observed in captive desert tortoises (in Berry, 1997). Research scientists at the University of Florida described the disease as an upper respiratory tract disease (URTD) associated with a new and undescribed *Mycoplasma* (Jacobson et al., 1991). A transmission study demonstrated that the mycoplasma, *M. agassizii*, is a highly infectious pathogen and causes URTD (Brown et al., 1994). An enzyme-linked immunosorbent assay (ELISA) test for *M. agassizii* was developed (Schumacher et al., 1993) and was used to determine whether wild desert tortoises carried antibodies to the pathogen (Brown et al., 1994b; Jacobson et al., 1995).

Transmission studies by Mary Brown and her colleagues have shown that generalized stress clearly increases the susceptibility of tortoises to *Mycoplasma* infection (Brown et al.,

1994b; Brown et al., 1999). Additionally, there is evidence that animals may remain ELISA positive without showing overt disease, a clinical pattern consistent with the chronic nature of most mycoplasmal infections, and that the clinical expression of disease may be cyclical (Brown et al., 1999). Evidence now indicates that additional species of *Mycoplasma* are present in the population at the DTNA (Berry, data in preparation).

As part of an ongoing investigation to assess tortoise health and disease, the bodies of 24 ill or dead wild tortoises were necropsied to determine possible causes of death (Homer et al, 1998). Diseases observed included cutaneous dyskeratosis (n=7), shell necrosis (n=2), respiratory diseases (n=7), urolithiasis (n=3), and trauma (n=5).

Within weeks of the time that ill tortoises were discovered at the DTNA in 1988, tortoises at the Chuckwalla Bench in the eastern Colorado Desert of Riverside County, were discovered to have a cutaneous dyskeratosis characterized by shell lesions (Berry, 1990). An abnormally high number of tortoises, many of which were previously marked, were discovered dead. Research on the pathogenesis of the shell lesions was initiated by. The lesion has been characterized as a loss of normal integrity of the cornified layer of the affected scutes (Jacobson et al., 1994). This disease has not been observed in tortoises at the DTNA.

10. Human Visitation

The DTNA has become a major tourist attraction in the western Mojave Desert. The DTNA Interpretive Center has received 1,000-2,000 visitors each spring over the last 12 years, and the average visitor stays about 90 minutes (Connor, 2002). Visitors may have impacts on the tortoise over and above the threats documented above of deliberate tortoise removal, release and translocation, vandalism, trash and balloons, impacts of off-highway vehicle recreation, fire, and domestic dogs. Direct impacts include unintentional harassment of tortoises by excited visitors and elicitation of inappropriate behaviors such as causing a tortoise to withdraw into its shell for lengthy periods in direct sun. Indirect impacts include damage to burrows, trampling of habitat, and dispersal of seeds of exotics plants. Most visitors remain on the trails close to the Interpretive Center. Current practice is to ensure that when "short cuts" become evident on the ground, existing trails are modified to incorporate these where possible.

11. Reserve Size and Habitat Fragmentation

In its discussion of tortoise reserve design, the *Desert Tortoise (Mojave Population) Recovery Plan* (section II 5) specifies the importance of minimizing the perimeter to area ratio, that interconnected blocks of habitat are better than isolated blocks, and that linkages function better when the habitat within them is represented by protected, preferred habitat for the target species (FWS, 1994). An additional relevant criterion is the ability to use readily defensible boundaries such as roads where it is more practical to build fences and other barriers without degrading additional habitat.

Because the DTNA is well below the minimum size recommended in the Recovery Plan for a viable self-contained reserve, linkage and continuity with adjacent tortoise populations is an important consideration. The DTNA is connected to designated critical habitat only in its

extreme northeast corner where it abuts the Western Rand Mountains ACEC. Recent assessments by the Bureau show that the Western Rand Mountains ACEC has been severely impacted by off highway vehicle activity.

12. Urbanization & Development

The success of the land acquisition program within the DTNA has minimized but not entirely eliminated risks of developments occurring within the DTNA boundary. In 1983, two DTNA landowners mounted a legal challenge to the fencing and designation of the preserve, and a summary judgment was granted in favor of the United States (e.g. Mount v. United States, Ct. Cl., No. 709-81 L). The presence of private inholdings along the boundary of sections 13 and section 5 has to precluded placing protective fencing around the entire perimeter.

Increasing urbanization and development within California City is threat to the DTNA that need to be carefully monitored. The local authority in California City is attempting to attract new business and development to the city, and a major redrawing of City boundaries is underway. There are plans to pave the last stretch of 20 Mule Team Parkway between California City and Highway 395 that could accelerate housing development to the southeast.

C. LAND ACQUISITION PRIORITIES

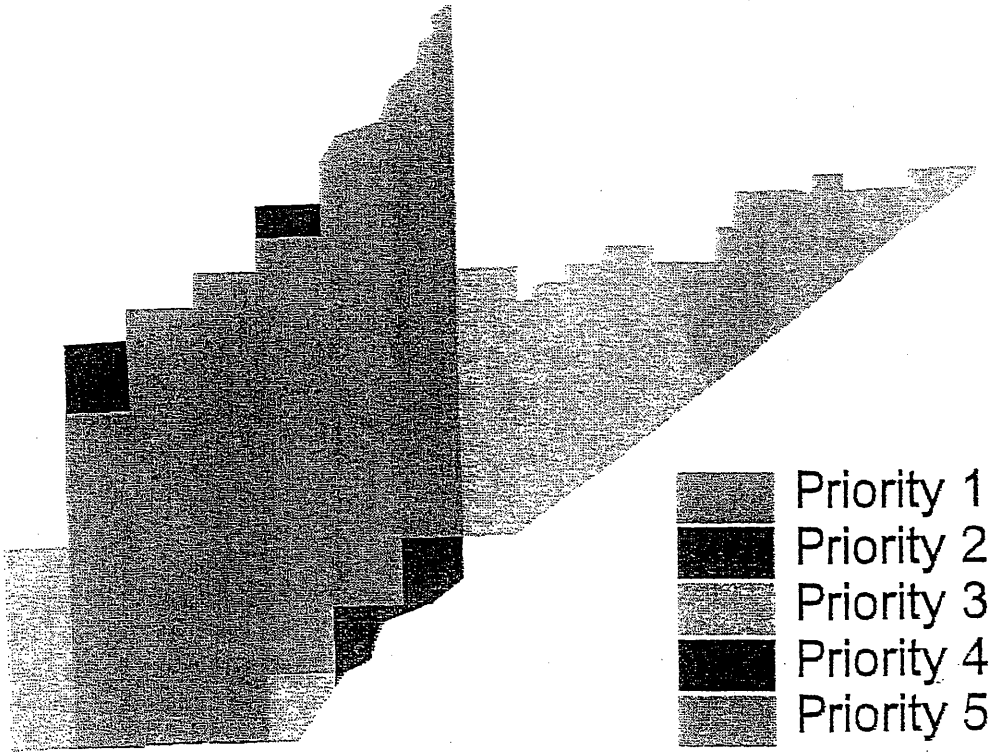
The DTPC has been acquiring land at the DTNA since 1976. Over the years, acquisition priorities have developed and been revisited as acquisition goals have been reached and new opportunities and conditions have arisen. The DTPC has developed an effective land banking and mitigation program for the desert tortoise, Mohave ground squirrel and other species that share their habitat. At the present time, the DTPC is actively acquiring land in the DTNA and surrounding area.

Land acquisition priorities have been established based on consideration of the following factors: (a) consolidation of existing preserve areas; (b) habitat quality; (c) linkage to critical habitat; (d) degree of parcel fragmentation; (e) reduction of edge effects; (f) contribution to a defensible boundary; (g) presence of existing developments or disturbance; (h) ease of acquisition. For convenience, 5 broad land acquisition zones are recognized prioritized from 1 (highest) to 5 (lowest). These zones are identified in table 4 and are mapped in figure 6.

Table 4. DTPC Acquisition Priorities At the DTNA and Surrounding Area

PRIORITY	DESCRIPTION	FACTORS
1	DTNA	(a) (b) (f)
2	Randsburg-Mojave Road Buffer Zone	(a) (b) (e) (f)
3	East/west expansion	(b) (c) (d) (e) (f)
4	Northwest expansion	(d) (f) (g)
5	Far east expansion	(b) (c)

Figure 6. Prioritized Land Acquisition Zones Around the DTNA



4. GOALS & OBJECTIVES

In furtherance of its mission to conserve and recover the desert tortoise and to conserve other rare and sensitive species, the Committee's goals at the DTNA are to:

(a) consolidate, enhance and enlarge the Desert Tortoise Natural Area.
(b) implement the recommendations of the *Desert Tortoise (Mojave Population) Recovery Plan* to at the DTNA and adjacent habitat;
(c) implement the goals and actions outlined in the DTNA ACEC Plan;
(d) provide research and education opportunities;
(e) modify management as needed to reflect advances in conservation science and changing conditions.

These goals will be achieved through the following objectives:

Objective 1: Protect, conserve, and enhance habitat in and around the DTNA for the benefit of the tortoise and other native species by eliminating sources of deterioration and loss through unauthorized grazing of sheep, unauthorized vehicle access, road kill, and the growing threat of urbanization & development. [Goals (a), (b), (c)]

Actions:

(a) Prioritize acquisition of private lands within delineated expansion boundaries to consolidate preserve areas and reduce fragmentation.
(b) Prioritize acquisition of private lands and/or fence easements along delineated boundaries.
(c) Sign all preserve lands.
(d) Fence large blocks of land (1 square mile) with stock-proof fencing to facilitate habitat recovery. Use metal fence posts to obviate the need to use raven wire.
(e) Fence preserve lands along defensible boundaries such as the Randsburg Mojave Road where appropriate.

Objective 2: Protect and enhance desert tortoise populations in the DTNA and surrounding areas and thus help reverse population declines within the DTNA by reducing tortoise handling & manipulation, tortoise collection, release of pet turtles and tortoises, and vandalism. [Goals (a), (b), (c), (d)]

Actions:

(a) Install and maintain informative and warning signs.
(b) Increase DTPC naturalist presence during high visitation periods.
(c) Discourage tortoise predators such as ravens by installing small mesh fencing along sections of road to reduce roadkill.

Objective 3: Recover desert tortoise populations in the DTNA and surrounding areas by reducing loss of adult tortoises and enhancing hatchling survival and recruitment. [Goals (b), (c), (d) (e)]

Actions:

(a) Evaluate and develop controlled tortoise "head starting" protocols.
(b) Install tortoise-proof fencing along Randsburg-Mojave Road.
(c) Evaluate the need and efficacy of dog fencing on the DTNA western boundary.

Objective 4: Restore areas of degraded habitat to a more natural state. [Goals (b), (c), (d)]

Actions:

(a) Remove trash and debris from preserve lands to reduce fire risk.
(b) Identify degraded habitat areas suitable for experimental revegetation or seeding.
(c) Implement revegetation/seeding projects

Objective 5: Encourage use of reserve lands for research into desert restoration and habitat conservation. [Goals (a), (c)]

Actions:

(a) Establish a grant program to encourage students to develop and implement research projects on restoration of degraded habitat in DTNA expansion area lands.

Objective 6: Maintain and develop monitoring programs to determine effectiveness of management actions, status of habitat, and status of desert tortoise population, Mohave ground squirrel population and other species of concern. [Goals (b), (c), (d), (e)]

Actions:

(a) Perform twice-yearly inspections of target land parcels for signs of sheep and ORV egress, trash and build up of noxious weeds that could pose a fire risk.
(b) Perform fence patrols at least once a month.
(c) Monitor tortoise population density and demographics by securing funding to survey the permanent study plots every four years.
(d) Perform biotic surveys for listed species and species of concern on acquisition lands.

Objective 7: Develop a Memorandum of Understanding with the Bureau of Land Management and California Department of Fish & Game. [Goals (a), (c)]

Actions:

(a) Develop a Memorandum of Understanding with the Bureau of Land Management and California Department of Fish & Game to support the concept of an enlarged DTNA.

Objective 8: Provide annual reports detailing management activity. [Goals (a), (e)]

Actions:

(a) Prepare a list of special reporting requirements for parcels tied to specific mitigation agreements where such reports are required.
(b) Generate an annual report that summarizes management actions, survey results, and provides a property analysis report and fulfills any special reporting requirements specified in (a) for each parcel in the management zone.

Objective 9: Work to implement goals of the 1986 DTNA ACEC Plan. [Goals (c)]

1. Protect, conserve, and enhance desert tortoise populations. Allow populations to fluctuate naturally. Reverse population declines.

Actions:

Reduce collections of desert tortoises by installing and maintaining signs and increasing presence of law enforcement personnel and visitor services specialists.

Reduce releases of desert tortoises and non-native turtles and tortoises by installing signs and increasing presence of law enforcement and visitor services personnel.

Reduce vandalism to desert tortoises by signing boundaries and increasing presence of law enforcement personnel.

Reduce losses of desert tortoises from vehicle kills by installing and maintaining signs and increasing presence of law enforcement and visitor services personnel.

Reduce harassment of desert tortoise by visitors through increasing the presence of law enforcement and visitor services personnel during the spring season.

Reduce incidence of raven predation on juvenile tortoises to natural levels. Eliminate losses of desert tortoises from firearms use by closing the area to all firearm use.

2. Protect, conserve, and enhance habitat in the DTNA for native species; eliminate sources of deterioration and loss.

Actions:

Eliminate unauthorized ingress of sheep onto public lands on the Natural Area; eliminate sheep grazing on private lands within the DTNA.

Eliminate unauthorized vehicle access through vandalized portions of fence and through naturally damaged parts of fence.

Acquire private lands within Natural Area boundaries.

Protect habitat in the vicinity of the Interpretive Center from undue degradation and impact.

Protect DTNA from fires, natural and man-caused.

4. Promote contemplative recreation and educational activities (e.g., sightseeing, nature walks, photography, hiking, etc.). maintain recreational, scenic, and aesthetic values. Protect safety of visitors.

Actions:

Maintain nature trails and trail guides. Provide brochures for Interpretive Center.

5. Foster appropriate research and study at the DTNA while at the same time protecting natural values.

6. Maintain an active monitoring program to determine effectiveness of management actions, status of desert tortoise populations and other species of concern, status of habitat, and the integrity of the DTNA and its boundaries.

Actions:

Continue to monitor the tortoise population on permanent study plots and expand monitoring efforts to include the western portion of the DTNA.

7. Maintain continuity with desert tortoise and other animal populations in the DTNA with animal populations in other parts of the Fremont-Kramer Critical Habitat.

8. Protect the DTNA from impacts that would result from development of leasable minerals and mineral material sales.

Actions:

Eliminate all sources of impact to the DTNA due to potential mineral development through a management decision.

Objective 10: Coordinate fully with the BLM and other agencies. [Goals (b), (c), (e)]

Actions:

(a) Work with BLM to fully revise and update the 1988 DTNA ACEC Plan to incorporate *Recovery Plan* recommendations, and to expand the existing boundaries.
(b) Work with the BLM and other agencies to implement *Recovery Plan* recommendations rangewide to tackle landscape level issues such as raven and disease management.

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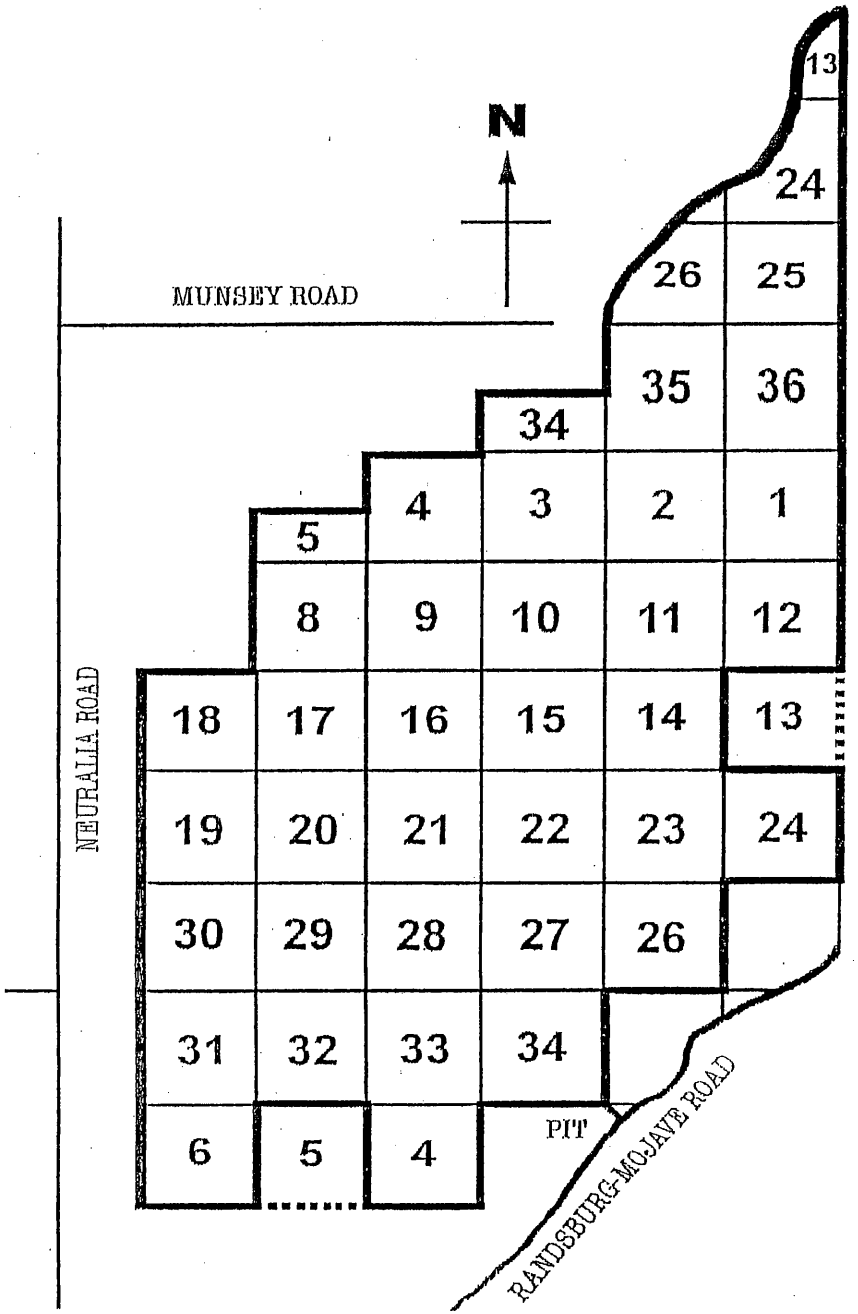
Appendix A

AGREEMENTS UNDER WHICH THE DESERT TORTOISE PRESERVE COMMITTEE HAS ACQUIRED LAND AT THE DTNA AND SURROUNDING AREA

Name	Year	Acres
Environmental Enhancement & Mitigation Grant	1988	647
Kerr-McGee	1988	40
Mojave Cogeneration	1989	38
Environmental License Plate Fund	1989	100
Yucca Valley Churches	1993	5
Barstow Veterans Home	1995	58
Coso/Luz Transmission	1998	110
Mojave Water Agency	1998	320
City of Palmdale	2000	90
High Desert Power	2001	182
California Department of Transportation	2002	1820
Sempra / High Desert Pipeline	2002	671

DESERT TORTOISE PRESERVE COMMITTEE **ESERT TORTOISE NATURAL AREA ACTIVITY REPORT**



DATE:	START TIME:	
WORKER(S):	STOP TIME:	
	TOTAL TIME:	

LOCATION(S):

SECTION # _____ BORDER CORNER INTERIOR

N S E W VISITOR CENTER OFF SITE

MAINTENANCE TASK:

FENCE LINE CHECK	SIGN
FENCE REPAIR	TRAIL
RAVEN WIRE	VISITOR CENTER
ROAD WORK	OTHER MAINTENANCE
TRASH CLEAN-UP	BLM RIDE ALONG

MAINTENANCE TASK DETAIL: **COST:**

COMMENTS/SUGGESTIONS/MAINTENANCE NEEDS:

Appendix C

DESERT TORTOISE NATURAL AREA
INVENTORY OF VERTEBRATE SPECIES

This inventory of the reptiles, mammals and birds of the Desert Tortoise Research Natural Area is based on lists prepared by Dr. Kristin H. Berry (Berry, 1978) with the additional observations made by DTPC naturalists stationed at the Natural Area and by others. Names of reptiles are based on Collins and Taggart (2002).

Reptiles

ORDER TESTUDINES - Turtles and Tortoises

Family Testudinidae

- Desert tortoise, *Gopherus agassizii* (Cooper, 1863)

ORDER SQUAMATA SUBORDER LACERTILIA - Lizards

- Zebra-tailed lizard, *Calisaurus draconoides* Blainville, 1835
- Western whiptail lizard, *Cnemidophorus tigris tigris* Baird & Girard, 1852
- Banded gecko, *Coleonix variegatus variegatus* (Baird, 1858)
- Collared lizard, *Crotaphytus bicinctores* Smith & Tanner, 1972
- Desert iguana, *Dipsosaurus dorsalis* (Baird & Girard, 1852)
- Long-nosed leopard lizard, *Gambelia wislizenii* (Baird & Girard, 1852)
- Desert horned lizard, *Phrynosoma platyrhinos calidiarum* (Cope, 1896)
- Desert spiny lizard, *Sceloporus magister uniformis* Phelan & Brattstrom, 1955
- Chuckwalla, *Sauromalus obesus* Dumeril, 1856
- Side-blotched lizard, *Uta stansburiana* Baird & Girard, 1852
- Desert night lizard, *Xanthusia vigilis vigilis* Baird, 1858

ORDER SQUAMATA SUBORDER SERPENTES - Snakes

- Glossy snake, *Arizona elegans* Kennicott, 1859
- Rosy boa, *Charina trivirgata* Cope, 1861
- Mojave shovel-nosed snake, *Chionactis occipitalis occipitalis* (Hallowell, 1864)
- Mojave desert sidewinder, *Crotalus cerastes cerastes* Hallowell, 1854
- Mojave rattlesnake, *Crotalus scutulatus scutulatus* (Kennicott, 1861)
- Panamint rattlesnake, *Crotalus mitchelli stephensi* Klauber, 1930
- Desert night snake, *Hypsiglena torquata* (Gunther, 1860)
- King snake, *Lampropeltis getula californiae* (Blainville, 1835)
- Western blind snake, *Leptotyphlops humilis* (Baird & Girard, 1853)
- Red racer or coachwhip, *Masticophis flagellum piceus* (Cope, 1892)
- Spotted leaf-nosed snake, *Phyllorhynchus decurtatus* (Cope, 1868)
- Gopher snake, *Pituophis catenifer deserticola* Stejneger, 1893
- Long-nosed snake, *Rhinocheilus lecontei lecontei* Baird & Girard, 1853
- Mojave patch-nosed snake, *Salvadora hexalepis mojavensis* Bogert, 1945
- Western ground snake, *Sonora semiannulata* Baird & Girard, 1853
- Black-headed snake, *Tantilla hobartsmithi* Taylor, 1936

Mammals

Order Carnivora

Family Canidae

- Desert kit fox, *Vulpes macrotis arsipus*
- Grey fox, *Urocyon cinereoargenteus* (Schreber, 1775)
- Coyote, *Canis latrans mearnsi*

Family Felidae

- Bobcat, *Lynx rufus baileyi*

Family Mustelidae

- American badger, *Taxidea taxus berlandieri*
- Striped skunk, *Mephitis mephitis*
- Spotted skunk, *Spilogale putorius*

Family Procyonidae

- Ringtail cat, *Bassariscus astutus willetti*

Order Chiroptera

Family Vespertilionidae

- Western pipistrelle, *Pipistrellus hesperus hesperus*

Order Insectivora

Family Soricidae

- Crawford's desert shrew, *Notiosorex crawfordi crawfordi*

Order Lagomorpha

Family Leporidae

- Black-tailed hare, *Lepus californicus*
- Audubon cottontail, *Sylvilagus auduboni arizonae*

Order Rodentia

Family Sciuridae

- Antelope Ground Squirrel, *Ammospermophilus leucurus leucurus*
- Mohave ground squirrel, *Spermophilus mohavensis*

Family Geomyidae

- Botta pocket gopher, *Thomomys bottae mohavensis*

Family Heteromyidae

- Little pocket mouse, *Perognathus longimembris longimembris*
- Long-tailed pocket mouse, *Perognathus formosus mohavensis*
- Merriam's Kangaroo Rat, *Dipodomys merriami* Mearns, 1890
- Panamint Kangaroo rat, *Dipodomys panamintinus* (Merriam, 1894)

Family Cricetidae

- Canyon mouse, *Peromyscus crinitus stephensi*
- Deer mouse, *Peromyscus maniculatus sonoriensis*
- Desert woodrat, *Neotoma lepida lepida*
- Grasshopper mouse, *Onychomys torridus pulcher*

Birds Species that breed at the Natural Area are indicated in **bold.**

Order Apodiformes

Family Trochilidae
- Anna's hummingbird, *Calypte anna*
- Black-chinned hummingbird, *Archilochus alexandri*
- Costa's hummingbird, *Calypte costae*

Order Caprimulgiformes
Family Caprimulgidae
- Lesser nighthawk, *Chordeiles acutipennis*
- Poor-will, *Phalaenoptilus nutallii*

Order Columbiformes
Family Colubidae
- Mourning dove, *Zenaida macroura*
- Rock dove (domestic pigeon), *Columba livia*

Order Cuculiformes
Family Cuculidae
- Greater roadrunner, *Geococcyx californianus*

Order Falconiformes
Family Accipitridae
- Golden eagle, *Aquila chrysaetos*
- Northern harrier, *Circus cyaneus*
- Red-tailed hawk, *Buteo jamaicensis*
- Rough-legged hawk, *Buteo lagopus*
- Swainson's hawk, *Buteo swainsoni*

Family Cathartidae
- Turkey vulture, *Cathartes aura*

Family Falconidae
- Prairie falcon, *Falco mexicanus*

Order Galliformes
Family Phasianidae
- Chukar, *Alectoris chukar*
- Gambel's quail, *Lophortyx gambelii*

Order Passeriformes
Family Alaudidae
- Horned lark, *Eremophila alpestris*

Family Corvidae
- Common raven, *Corvus corax*

Family Fringillidae
- Black-headed grosbeak, *Pheucticus ludovicianus*
- Black-throated sparrow, *Amphispiza bilineata*
- Brewer's sparrow, *Spizella breweri*
- Chipping sparrow, *Spizella passerina*
- Dark-eyed Junco, *Junco hyemalis*
- House finch, *Carpodacus mexicanus*
- Lark sparrow, *Chondestes grammacus*
- Lazuli bunting, *Passerina amoena*
- Lesser goldfinch, *Carduelis psaltria*

- Sage sparrow, *Amphispiza belli*
- White-crowned sparrow, *Zonotrichia leucophrys*

Family Hirundinidae
- Barn swallow, *Hirundo rustica*
- Cliff swallow, *Petrochelidon pyrrhonota*
- Rough-winged swallow, *Stelgidopteryx ruficollis*
- Tree swallow, *Iridoprocne bicolor*
- Violet green swallow, *Tachycineta thalassina*

Family Icterinae
- Brewer's blackbird, *Euphagus cyanocephalus*
- Bullock's oriole, *Icterus galbula*
- Scott's oriole, *Icterus parisorum*
- Western meadowlark, *Sturnella neglecta*

Family Laniidae
- Loggerhead shrike, *Lanius ludovicianus*

Family Mimidae
- LeConte's thrasher, *Toxostoma lecontei*
- Mocking bird, *Mimus polyglottus*
- Sage thrasher, *Oreoscoptes montanus*

Family Muscicapidae
- Ruby-crowned kinglet, Regulus calendula

Family Paridae
- Verdin, *Auriparus flaviceps*

Family Parulinae
- Audubon's warbler, *Dendroica coronata*
- Black-throated gray warbler, *Dendroica nigrescens*
- Townsend's warbler, *Dendroica townsendi*
- Wilson's warbler, *Wilsonia pusilla*

Family Ptilogonatidae
- Phainopepla, *Phainopepla nitens*

Family Sturnidae
- European starling, *Sturnus vulgaris*

Family Thraupidae
- Western tanager, *Piranga ludoviciana*

Family Troglodytidae
- Cactus wren, *Campylorhynchus brunneicapillus*
- Rock wren, *Salpinctes obsoletus*
- Winter wren, *Troglodytes troglodytes*

Family Turdidae
- Hermit thrush, *Catharus guttatus*
- Mountain bluebird, *Sialia currucoides*

Family Tyrannidae
- Ash-throated flycatcher, *Myiarchus cinerascens*
- Black phoebe, *Sayornis nigricans*
- Say's phoebe, *Sayornis saya*
- Western kingbird, *Tyrannus verticalis*

- Western wood pewee, *Contopus sordidulus*

Family Vireonidae

- Bell's vireo, *Vireo bellii*
- Gray vireo, *Vireo vicinior*

Order Piciformes

Family Picidae

- Common (red-shafted) flicker, *Colaptes auratus*
- Ladderback woodpecker, *Picoides scalaris*

Order Strigiformes

Family Strigidae

- Short-eared owl, *Asio flammeus*
- Burrowing owl, *Athene cunicularia*