WASHINGTON COUNTY, UTAH
DESERT TORTOISE INCIDENTAL TAKE PERMIT APPLICATION/DOCUMENTS
Part II

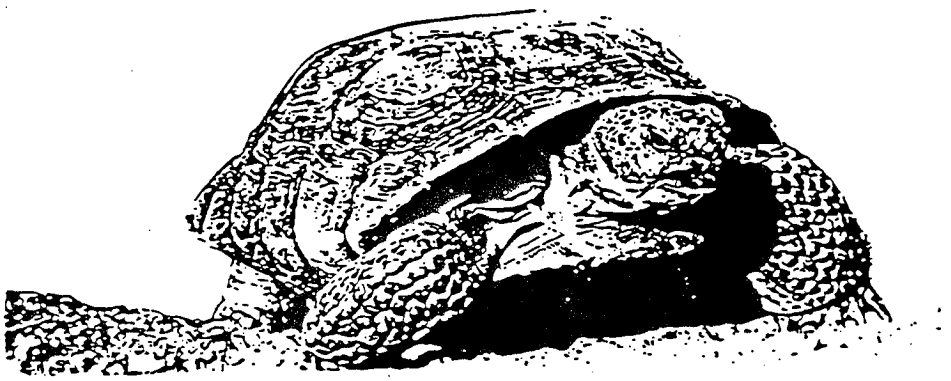
Washington County, Utah
Habitat Conservation Plan

Submitted by
Washington County Commission
Washington County, Utah

Submitted to
U.S. Fish and Wildlife Service

Prepared by
Washington County HCP Steering Committee
and
SWCA, Inc. Environmental Consultants

December 1995



Habitat Conservation Plan
Washington County, Utah

Submitted by:

Washington County Commission
197 East Tabernacle
St. George. Utah 84770
(801) 634-5700

Submitted to:

U.S. Fish and Wildlife Service
Utah Field Office
Lincoln Plaza. Suite 404
145 East 1300 South
Salt Lake City. Utah 84115
801-524-5001

Prepared by:

Washington County HCP Steering Committee

and

SWCA, Inc. Environmental Consultants
114 North San Francisco Street, Suite 100
Flagstaff, Arizona 86001
(800) 224-4234

December 1995

CHAPTER 1.0
INTRODUCTION

1.1 THE NEED FOR AN HCP IN WASHINGTON COUNTY

Washington County, one of the fastest growing retirement and recreational areas in the nation, is the fastest growing county in the State of Utah. From 1980 to 1990, the population of the County increased 86 percent from 26,125 to 48,560 (Washington County Water Conservancy District 1991). Three growth projections have been made for the population of the County by the year 2010. The first, by the State of Utah, projects a population of 101,400, an increase of 109 percent. The second, by the Five County Association of Governments, projects a population of 80.543, an increase of 66 percent. The third is by the Washington County Water Conservancy District which forecasts a population of 138,692, an increase of 186 percent.

The County also contains habitat for nine species which are listed as threatened or endangered pursuant to the Endangered Species Act of 1973 (Act). These nine species are listed in Table 1.1.

Table 1.1. Federally Listed Threatened and Endangered Species in Washington County.

Common Name	Scientific Name	Category
Mojave Desert Tortoise	*Gopherus agassizii*	Threatened
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Peregrine Falcon	*Falco peregrinus*	Endangered
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered
Woundfin Minnow	*Plagopterus argentissimus*	Endangered
Virgin River Chub	*Gila robusta seminuda*	Endangered
Dwarf Bear-Claw Poppy	*Arctomecon humilis*	Endangered
Siler Pincushion Cactus	*Pediocactus sileri*	Threatened

Conflicts have arisen between growth and development of particular areas in the County and protection afforded the Mojave desert tortoise under the Act. To provide a comprehensive solution to these conflicts, and to provide greater protection for the desert tortoise, Washington County assembled a Steering Committee to develop a comprehensive Habitat Conservation Plan (HCP) and obtain a Section 10(a)(1)(B) Incidental Take Permit from the U.S. Fish and Wildlife Service (USFWS). An incidental take permit is authorization under Section 10(a) of the Act to allow for "take" of a species listed under the Act. As defined in the ESA, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct with regard to federally listed species. The term "harm" is further defined to include activities that would modify or degrade habitat in a way that significantly impairs essential behavior patterns. The HCP process is designed to allow for take of species listed

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Washington County, in the southwestern corner of Utah, is located on Interstate 15 between Salt Lake City (320 miles to the north) and Las Vegas, Nevada (125 miles to the south). This is one of the nation's fastest growing counties, with new residents attracted to the scenic red rock areas directly north of St. George and Washington City, home of the highest density of Mojave desert tortoises in the United States. To allow continued development while complying with the requirements of the Endangered Species Act (Act), Washington County is applying to the U.S. Fish and Wildlife Service (USFWS) for a Section 10(a)(1)(B) Incidental Take Permit for Mojave desert tortoise, a Federally listed species.

The current status of desert tortoise habitat in Washington County is presented in Table ES1. None of these lands are specifically managed for desert tortoise, and their fragmentation creates non-contiguous habitat blocks. While Section 9 enforcement provisions of the Act apply to all State and private lands, and Section 7 consultation provisions apply to all Federal undertakings,

Table ES1. Current Desert Tortoise Habitat and Land Ownership.

	Desert Tortoise Density Classification[1]			
Ownership	Low (acres)	Medium (acres)	High (acres)	Total (acres)
Private/Municipal	11,521	1,704	5,828	19,053
State School Trust[2]	12,511	3,137	4,472	20,120
BLM	72,139	1,975	4,195	78,359
Zion National Park	2	0	0	2
Dixie National Forest	83	0	0	83
Paiute Indian Tribal Lands	2,521	2	47	2,570
Snow Canyon State Park	2,603	0	151	2,754
Total	101,380	6,818	14,693	122,891

1 The classification of density is based upon transect field studies which the Washington County Commission believes includes large areas with no actual desert tortoise involvement and no constituent habitat. The Commission is willing, however, to use these classifications—although they believe them to be erroneous and/or unsubstantiated—in order to facilitate creation of a reserve that will benefit many species.

2 212 acres of State School Trust lands are within the Paiute Indian Tribal Lands.

desert tortoise habitat in Washington County is becoming increasingly fragmented due to urban development. If current trends continue, it may be difficult for the USFWS to adequately protect the species and its habitat, as few or no proactive actions would likely be implemented as a result of Section 7 consultations or Section 9 enforcement measures.

Washington County has prepared this Habitat Conservation Plan (HCP) anticipating that it will provide a comprehensive approach to preserving and protecting Mojave desert tortoise habitat in Washington County, while at the same time allowing controlled growth and development in those portions of desert tortoise habitat which are less essential to the species. This HCP is part of Washington County's application for an incidental take permit for 1,169 animals and 12,264 acres of desert tortoise habitat and 31,282 acres of potential habitat (geographically isolated areas with no documented desert tortoise sign).

A Steering Committee was established in 1990 which included representatives from government agencies, livestock interests, environmental organizations, recreation interests, land developers, and landowners to formulate this HCP. The Steering Committee was charged with creating a plan which allows development in certain areas of desert tortoise habitat while increasing the likelihood of recovery of the listed species.

The HCP proposes the establishment of a wildlife reserve of 61,022 acres, including 38.787 acres of Mojave desert tortoise habitat. This reserve extends from the Paiute Indian Tribal Lands on the west to the City of Hurricane on the east. Within this area, uses will be carefully controlled and all management actions will place the desert tortoise as the highest priority. Outside the reserve, development of desert tortoise habitat will be allowed in designated take areas. Federal habitat areas outside of the proposed reserve will be subject to Section 7 consultations with the USFWS. A summary of the status of the disposition of the desert tortoise habitat following HCP implementation is provided in Table ES2. The reserve also provides habitat for numerous Federal candidate and State sensitive species.

Table ES2. Summary of Disposition of Desert Tortoise Habitat Following HCP Implementation.

	Desert Tortoise Density Classification[1]		
	Low (acres)	Medium (acres)	High (acres)
Reserve	20,447	5,437	12,903
Non-Take	71,597	65	177
Incidental Take	9,336	1,316	1,612
Total	101,380	6,818	14,692

[1] The classification of density is based upon transect field studies which the Washington County Commission believes includes large areas with no actual desert tortoise involvement and no constituent habitat. The Commission is willing, however, to use these classifications, although believed to be erroneous and/or unsubstantiated, in order to facilitate creation of a reserve that will benefit many species.

The plan will be funded by collection of county-wide fees for building permits and land clearing. Acquisition of habitat, fencing, enforcement, education, and removal of competing uses will comprise the mitigation for the proposed take. The HCP creates an ongoing administration for the purpose of minimizing, mitigating, and monitoring impacts on the desert tortoise, as well as a framework for working with candidate and sensitive species which may be listed in the future.

This document details the impacts of the proposed take and how it will be monitored, minimized, and mitigated. It also catalogs State sensitive and Federal candidate species within the County and describes alternatives, ranging from total preservation to unlimited development, considered during the development of the HCP. The plan enhances the survival of the desert tortoise and other species, while providing for continued community development. The Steering Committee believes that this plan represents the best possible compromise to an extremely difficult problem.

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Siler Pincushion Cactus	*Pediocactus sileri*	Threatened

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under the Act as long as the species is protected, habitat is conserved, and the permitted incidental take will not jeopardize the ultimate survival of the species. Further, the take permit applicants must demonstrate that they have minimized, mitigated, and monitored the proposed take to the maximum extent practicable.

This HCP is seeking an incidental take permit only for the Mojave desert tortoise. No take is being considered for the bald eagle, peregrine falcon, spotted owl, southwestern willow flycatcher, woundfin, or Virgin River chub, and take permits are not required for plant species on non-Federal lands. However, all nine Federally listed species are being addressed in this document, as well as all current Federal candidate and State sensitive species.

1.2 PLAN AREA AND PROPOSED ACTIVITIES

To provide a comprehensive analysis, the Steering Committee directed that the HCP planning area include all of Washington County as presented in Figure 1.1. This area includes habitat for all nine threatened and endangered species. Land ownership in Washington County is predominantly Federal as depicted in Table 1.2.

Table 1.2. Land Ownership in Washington County.

Land Status	Acres	Percent
Federal	1,176,289	76%
State	94,747	6%
Private/Other	280,964	18%
Total	1,552,000	100%

Proposed activities identified in Washington County needing an incidental take permit include those associated with growth and development, as well as mining, farming, road building, and utility corridors. A comprehensive list of permitted activities is presented in Chapter 6.

The permit length is proposed to be 20 years, from 1994 to 2014. This HCP is open for amendment, if the amendments do not violate the spirit or compromise the integrity of this HCP.

1.3 THE HCP PLANNING PROCESS

Washington County initiated its HCP planning process in late 1990 with the formation of a committee to evaluate various options and recommend a course of action to the Washington County Commission. This committee concluded that it would be in the best interest of the County and its citizens to proceed with development of an HCP and to obtain a Section 10(a)(1)(B) permit.

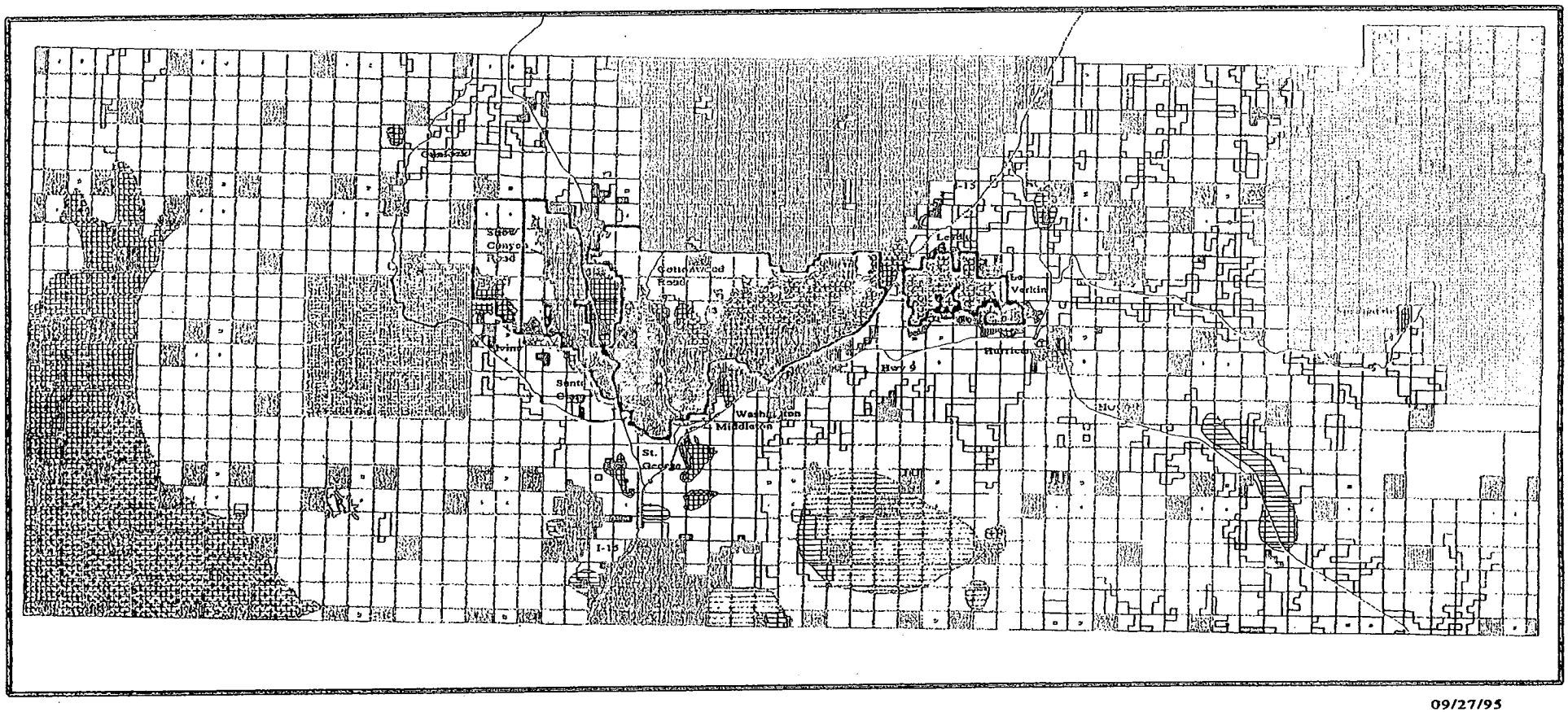


Figure 1.1. Washington County Tortoise Habitat

In January 1991, Washington County organized an HCP Steering Committee, with representation as presented in Table 1.3. Scott Hirschi served as chairman and facilitator of the Steering Committee. Washington County was selected as the permit applicant as it was the logical entity for a county-wide HCP. The Steering Committee assumed responsibility for deciding the content of and making the decisions for the HCP. A technical consultant was retained to fulfill the tasks of conducting biological inventories, developing a computerized database of land ownership and reserve boundaries, and preparing the HCP and accompanying NEPA documents.

It was a challenge for the Steering Committee to include all those with an interest in the HCP process while keeping the number of participants at a manageable level. Washington County attempted to balance conflicting objectives by establishing a 15-member Steering Committee. Representation included all levels of government, including the Bureau of Land Management Dixie Resource Area Office, Utah Division of Wildlife Resources, Washington County, the local Water Conservancy District, and the incorporated cities within the County. Environmental groups were represented by the Nature Conservancy and Southern Utah Wilderness Alliance/Humane Society of the United States. Grazing, recreation, and real estate/development interests, as well as Federal Congressional representatives, were included on the Steering Committee. Because large areas of school and other institutional trust lands are populated by the desert tortoise, the Utah Division of State Lands and Forestry, as Trustee, also served on the Steering Committee. This wide array of interests provided the Steering Committee with all possible viewpoints for a thorough evaluation of planning considerations. The USFWS was also included as a non-voting member of the Committee to help guide the Steering Committee through the consensus-making and HCP approval processes.

Initially, the Steering Committee formed three subcommittees. The funding committee, chaired by Ron Thompson, was charged with obtaining the necessary funding for the development of the HCP. The Technical Advisory Committee, chaired by the BLM representative, was charged with determining the quality and adequacy of the existing biological information, deciding what additional biological information needed to be collected, and evaluating the quality of the new information. The education committee, chaired by Milo McCowan, was charged with developing and disseminating a brochure and video about the HCP. The Steering Committee also solicited proposals and selected a consultant to assist in the biological studies and preparation of the HCP.

1.3.1 Funding Committee

Funding for the development of the Washington County HCP was contributed by a variety of sources (see Table 1.4). Funds previously earmarked for implementation of the HCP come from compensation paid by Kern River Pipeline and Utah Associated Municipal Power Systems (UAMPS) for impacts to desert tortoise habitat.

Table 1.3. Membership and Affiliation on the Washington County HCP Steering Committee.

Chairman:	
Mr. Steve Snow	Snow, Nuffer, Engstrom, & Drake
Previous Chairman:	
Mr. Scott Hirschi	Washington County Commissioner
Voting Members:	
Mr. Scott Belfit	Bureau of Land Management
Mr. Christopher Blake	Washington County Mayor's Association
Mr. Duane Blake	Washington County Cattlemen's Association
Mr. Jim Doyle	Rocky Mountain Ventures
Mr. Russell Gallian	Washington County Commission
Mr. Steve Johnson	Southern Utah Wilderness Alliance/Humane Society of the United States
Mr. Milo McCowan	Development
Mr. Chris Montague	The Nature Conservancy
Mr. Ted Stewart	Utah Department of Natural Resources
Mr. Ron Thompson	Washington County Water Conservancy District
Non-Voting Members:	
Mr. Rick Arial	Congressman Jim Hansen
Mr. Darin Bird	Senator Robert Bennett
Ms. Jeannine Holt	Senator Orrin Hatch and Senator Jake Garn (term ended 12/92)
Mr. Robert Williams	U.S. Fish and Wildlife Service
Executive Assistants:	
Ms. Georgette Kent	
Ms. Linda Sappington	
Others who served on the committee were:	
Ms. Bette Arial	Congressman Jim Hansen/BLM
Mr. Robert Benton	U.S. Fish and Wildlife Service
Mr. Mike Coffeen	Utah Division of Wildlife Resources
Mr. Bob Douglas	Bureau of Land Management
Mr. Rick Fridell	Utah Division of Wildlife Resources
Mr. Doug McKnight	Recreation
Mr. John Payne	Bureau of Land Management
Ms. Debbie Pietrzak	Bureau of Land Management
Mr. Ed Storey	Utah Division of State Lands and Forestry
Ms. Marilet Zablan	U.S. Fish and Wildlife Service

Table 1.4. Sources of Funding for the Preparation of the HCP.

Source	Amount
State of Utah:	
Land Grant Maintenance	$50,000.00
General Funds	21,000.00
Community Impact Board	200,000.00[1]
Washington County:	52,000.00
Cities:	
Hurricane	3,871.00
Enterprise	920.00
Leeds	164.00
Rockville	181.00
Santa Clara	2,281.00
Springdale	309.00
Toquerville	488.00
Washington	4,171.00
Virgin	217.00
St. George	27,913.00
Ivins ($1,179.00)[2]	00.00
LaVerkin	1,740.00
Hildale ($969.00)[2]	00.00
New Harmony ($102.00)[2]	00.00
Washington County Water Conservancy District	5,000.00
U.S. Fish and Wildlife Service	70,000.00
The Nature Conservancy	1,000.00
Washington County Cattlemen	500.00
R.C. Tolman Development	300.00
Jim Doyle	140,000.00
Kern River Gas (Incl. 1991 Interest)	174,424.00
Washington County Realtors	4,143.00
Subtotal	760,622.00
1991 Interest	5,089.00
Total	$765,711.00

[1] Grant to the Water District from the Community Impact Board for HCP development.
[2] Amount pledged.

1.3.2 Technical Advisory Committee

The Technical Advisory Committee (TAC) initially reviewed the existing biological data for Washington County and determined there was insufficient information upon which to make sound biological judgments for the HCP. As a result, over 920 new one-mile transects were surveyed in the County in order to better define desert tortoise habitat boundaries and densities. Combined with existing transect data from the BLM and the Utah Division of Wildlife Resources (UDWR), a density classification and distribution map of the County was prepared. This map was modified by the TAC using soil types, physical geographic features, and vegetative communities. By basing the map on these data, the map depicts desert tortoise distribution and habitat quality in the County with sufficient accuracy for planning purposes. For the Siler pincushion cactus and dwarf bear-claw poppy, approximately 100 one-mile transects were surveyed to better define habitat boundaries. The TAC determined that existing information on the other six listed species was sufficient and no further studies were warranted for the purposes of this HCP.

1.3.3 Education Committee

The education committee prepared a brochure about the HCP process and the Act which was widely circulated throughout the County, targeting school children in grades 6–12. One hundred copies of a 20-minute video were also prepared and distributed throughout the County and State, as well as to the media, in order to increase public understanding of the Act and its impact on Washington County.

1.3.4 Technical Consultant

Through a competitive process, SWCA, Inc. Environmental Consultants of Flagstaff, Arizona, was selected to conduct biological surveys of transects under the direction of the TAC. The Steering Committee decided to retain SWCA to serve as its technical staff in developing the HCP.

1.3.5 Submission of the December 1992 HCP and USFWS Response

Through almost 30 meetings of the Steering Committee, an HCP was developed and submitted to the USFWS on December 16, 1992. This HCP had a proposed reserve of approximately 27,000 acres and a request for incidental take on approximately 12,000 acres of private and State land. Mitigation measures included reserve acquisition through land exchange, fencing, law enforcement, and acquisition of grazing permits. Although the HCP Steering Committee voted unanimously to submit the HCP to the USFWS, and the plan represented a balance of the interests, it did not receive the unanimous endorsement of the Steering Committee.

In March 1993, the USFWS expressed significant concern with the HCP submitted and suggested that the Steering Committee go back to the drawing board and create a larger reserve with increased mitigation. It was suggested that the Steering Committee refer to the recently

released Draft Desert Tortoise Recovery Plan (DDTRP) (USFWS 1993c) and utilize the TAC's biological expertise in a more productive way. The USFWS also suggested that Land and Water Conservation Fund (L&WCF) monies might be available to fund additional habitat acquisition.

1.3.6 Development of the Revised Washington County HCP

The Steering Committee worked closely with the USFWS through the remainder of 1993 and early 1994 to create an HCP which provided greater protection to the Mojave desert tortoise as well as the other listed and candidate species. During this time, Chairman Hirschi accepted the position of Director of the Division of State Lands and Forestry, and the Steering Committee selected attorney Steve Snow to become Chairman. Numerous subcommittees were established, including ones for fencing, translocation, monitoring, grazing, budget, implementation, boundaries, interlocal agreements, and land exchange. This document represents the combined efforts of the entire Steering Committee.

1.4 COORDINATION WITH THE DESERT TORTOISE RECOVERY PLAN (DTRP)

The Desert Tortoise Recovery Plan (DTRP) identifies six recovery units throughout the range of the Mojave desert tortoise, and two of these units are represented in Utah (USFWS 1994). Within each recovery unit, individual reserves are identified as Desert Wildlife Management Areas (DWMAs). The Beaver Dam Slope population is identified as a DWMA in the Northeastern Mojave Recovery Unit, and the Upper Virgin River DWMA is identified as the only DWMA within the Upper Virgin River Recovery Unit. All the desert tortoise habitat discussed for reserve and non-reserve within this HCP is part of the Upper Virgin River Recovery Unit. The Beaver Dam Slope, while identified in this HCP as desert tortoise habitat within Washington County, is not considered for a change in reserve status or for incidental take in this HCP. The Steering Committee has included, to the best of their ability, all of the DTRP's recommendations for this DWMA with the exception of closing Skyline Drive.

Recovery Plans for the Siler pincushion cactus and dwarf bear-claw poppy, which call for the development of a reserve, have been consulted. The Siler pincushion cactus was recommended for downlisting to threatened by the USFWS in March of 1993 (USFWS 1993a). This change occurred in September, 1995.

1.5 HCP GOALS AND OBJECTIVES

The goal of the Washington County HCP is to provide a mechanism to allow orderly growth and development in Washington County without further jeopardizing the status of Federally listed or candidate species, focusing on protection of the desert tortoise. In order to attain this goal, four objectives have been established:

- Provide adequate protection for the desert tortoise by implementing aspects of the DTRP through the creation and management of the Upper Virgin River Desert Wildlife Management Area.

- Provide protection for other listed and candidate species and their habitats.
- Meet the growth and development needs of the County.
- Create a framework within the County to deal with current and future listed species.

1.6 PROPOSED PROGRAM

The HCP proposes a seven-pronged approach for habitat conservation in Washington County:

- Place in Federal and State ownership and management a reserve including 38,787 acres of Mojave desert tortoise habitat and an additional 22,235 acres as buffer and other species habitat. This reserve would be bordered on the west by the Paiute Indian Tribal Lands; on the north by the Dixie National Forest; on the east by the City of Hurricane; and on the south by Skyline Drive, the northern portions of St. George and Washington City, and Interstate 15. Currently, less than two-thirds of this area is under Federal management. Part of the proposed reserve would be managed as an extension of Snow Canyon State Park.
- Remove competing and other consumptive uses within the reserve which may potentially adversely impact the Mojave desert tortoise and other Mojave Desert species. This includes fencing the reserve to eliminate the need for a buffer outside of the proposed reserve.
- Develop controls for minimizing take through county-wide ordinances, fees, environmental education, and enforcement, and develop a translocation program to attempt to preserve individuals which otherwise would be killed.
- Seek Congressional support for establishment of a National Conservation Area (NCA) with line-item management funding and establishment by year five of the plan.
- Assist the BLM and Utah Department of Natural Resources (UDNR) in reserve management until NCA status can be obtained.
- Establish a monitoring program in the reserve to determine desert tortoise population trends.
- Fund surveys and other actions to help gather information and identify and implement actions to help other listed and candidate species.

These activities will serve as the primary mitigation for an estimated level of incidental take of 12,264 acres of primarily low-density habitat in the County. This proposed level of incidental

take has been determined based on criteria including those areas likely to be developed within the next 20 years and areas which could be developed without significantly impacting the desert tortoise.

Although the total amount of desert tortoise habitat in the Upper Virgin River Recovery Unit will be reduced, the enhanced quality of the remaining habitat through removal of threats from development and other sources should more than compensate for this loss. When combined with the proposed mitigation, the proposed level of take should not adversely impact the Upper Virgin River Recovery Unit population of the desert tortoise. On the contrary, it is expected that implementation of this HCP should improve the quality of habitat and long-term survivability for the Mojave desert tortoise in this Recovery Unit.

1.7 IS THE DESERT TORTOISE NATIVE TO THE ST. GEORGE AREA?

There is debate between long-time residents of Washington County and the scientific community over the origin of the desert tortoise in Washington County. Many residents claim that no desert tortoises existed in the area prior to their introduction by humans. Based on numerous reports of scores of desert tortoises being brought to St. George, the Washington County Commission has concluded that the populations of desert tortoise have been at least significantly enhanced by human introduction. Scientists who have studied the region have argued that the occurrence of associated species in the area (such as Gila monsters and sidewinders) and the diverse age structure of the population make it likely that desert tortoises have been in this area for centuries. The TAC reviewed the various opinions and concluded it would be impossible to prove the origin of desert tortoises in the St. George area one way or the other. Whatever their origin, the desert tortoises in Washington County belong to a Federally listed species. As required by Section 9, USFWS considers the Washington County populations of desert tortoises protected under the Act. The Washington County Commission recognizes the position of the USFWS and desires to cooperate in the preservation of the desert tortoise.

CHAPTER 2.0
BIOLOGICAL PROGRAM

The purpose of the HCP is to provide, to the maximum extent practicable, for the perpetual protection of the Mojave desert tortoise in the Upper Virgin River Recovery Unit and conserve other listed, candidate, and sensitive species as much as possible, irrespective of the incidental take of the desert tortoises authorized by the permit. Further, it must be shown that such take will not jeopardize any of the other eight Federally listed species. To achieve this purpose, the HCP must be founded on an adequate understanding of the ecology of these protected and candidate species and the biological processes which affect the area as a whole. It is the opinion of the Steering Committee and the TAC that the biological studies which have been used to develop this HCP represent the best available information about the desert tortoise within Washington County.

2.1 SPECIES OF CONCERN

The Federally listed species in Washington County are the Mojave desert tortoise, bald eagle, peregrine falcon. Mexican spotted owl, southwestern willow flycatcher, woundfin minnow, Virgin River chub, dwarf bear-claw poppy, and Siler pincushion cactus.

2.1.1 Mojave Desert Tortoise

The species of primary concern is the Mojave desert tortoise due to its widespread distribution in potential development areas. The Mojave desert tortoise is distributed throughout the southwestern United States (see Figure 2.1). Desert tortoises exist in Washington County in areas where they can find adequate food and protection from temperature extremes. Figure 1.1 presents the range of the desert tortoise in Washington County and the relative densities of desert tortoise sign found. These data were based on intensive biological studies undertaken in 1991 to assess habitat areas and populations of the endangered, threatened, proposed threatened, and candidate species known to live in Washington County. Field studies consisted of one-mile transect surveys on habitat considered suitable or potentially suitable for the Mojave desert tortoise.

Results from approximately 1,000 of these transects were combined with UDWR and BLM field data to create a map of desert tortoise sign, which included burrows, scat, carcasses, or specific individuals. Areas of low, medium, and high tortoise density were then drawn around groups of transects that reflected low, medium, or high quantities of desert tortoise sign. Because a high correlation exists between the existence of desert tortoise sign and the presence of live desert tortoises. this information provided the basis for determining the quality of desert tortoise habitat and estimating population densities. Boundaries of these areas were then modified to reflect soil and vegetation conditions. A map of desert tortoise density, using the best available information. was produced and used in the HCP process. The amount of acreage, by desert tortoise density classification and general landownership, as well as an estimated desert tortoise population. is presented in Table 2.1.

Figure 2.1. Range of the Mojave Desert Tortoise

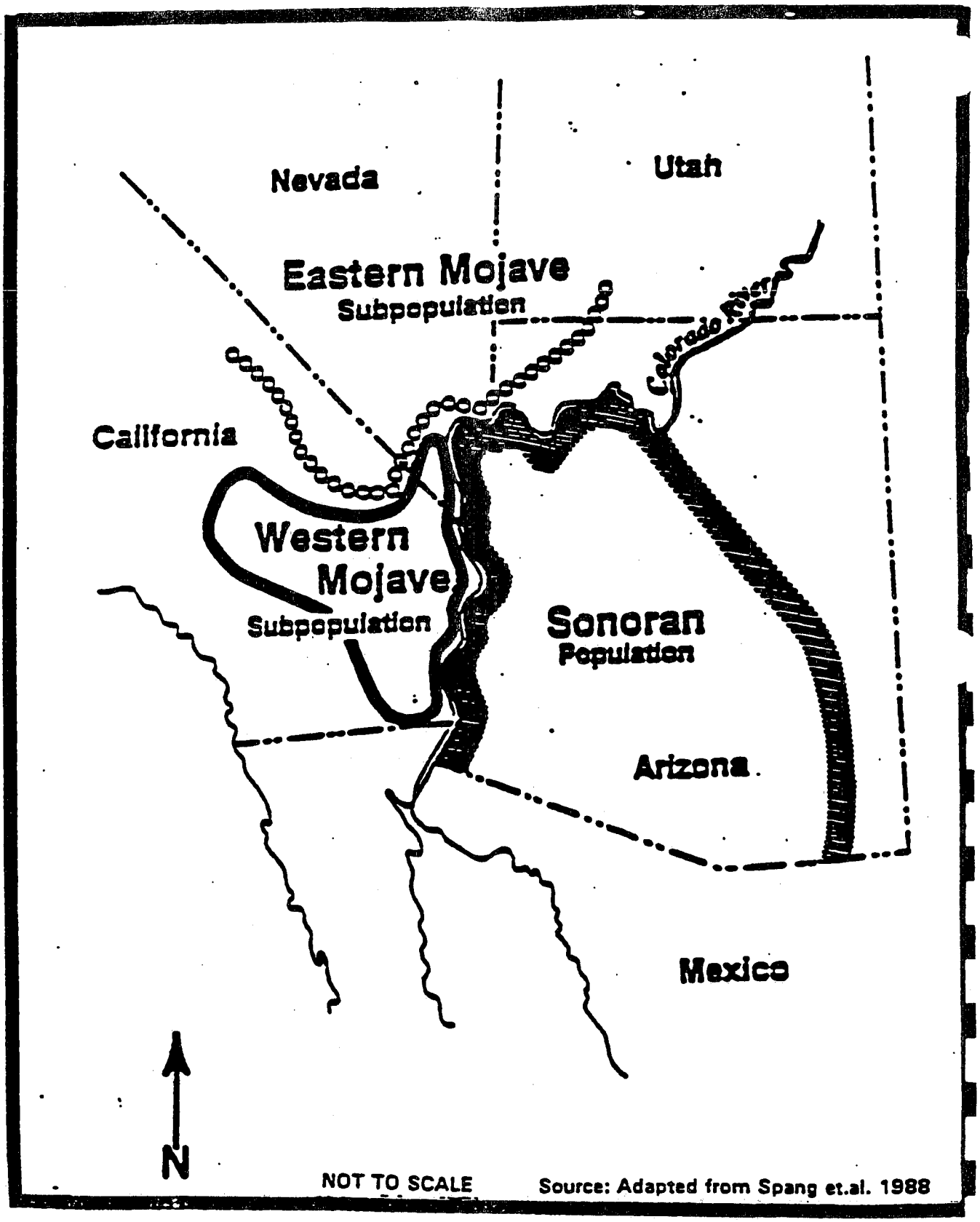


Table 2.1. Estimated Desert Tortoise Habitat Acreage and Number of Animals in the Upper Virgin River Recovery Unit.

Ownership	Desert tortoise Density Classification: Low (acres)	Medium (acres)	High (acres)	Total (acres)
Private/Municipal	9,463	1,704	5,828	16,975
State School Trust*	5,212	3,137	4,472	12,821
BLM	14,552	1,975	4,195	20,722
Zion National Park	2	0	0	2
Dixie National Forest	83	0	0	83
Paiute Indian Tribal Lands	2,251	2	47	2,570
Snow Canyon State Park	2,603	0	151	2,754
Total	34,436	6,818	14,693	55,947

Classification	Acreage	Number of Animals
High Density	14,693	5,739
Medium Density	6,818	799
Low Density	34,436	1,345
Total	55,947	7,883

	Range	Average
High Density:	101-400/square mile	250 animals/square mile
Medium Density:	51-100/square mile	75 animals/square mile
Low Density:	0-50/square mile	25 animals/square mile

* 212 acres of State School Trust lands are within the Paiute Indian Tribal Lands.

Desert tortoise populations in Washington County were estimated by conducting an intensive study of a one-mile plot near St. George in the summer of 1988. At the end of the summer, sign transects were completed within that plot and a correlation was established between corrected sign density and desert tortoise density. A multiplier was calculated to identify density per sign (in this case, 389 desert tortoises divided by 29.1 sign per one-mile transect equals 13.37 desert tortoises per square mile for each sign encountered on a one-mile transect). This multiplier was then used to identify areas of low density (1-50 desert tortoises per square mile), medium density (51-100 desert tortoises per square mile), and high density (101-400 desert tortoises per square mile).

Much of the desert tortoise population throughout the range appears to be suffering from an upper respiratory tract disease (URTD), causing their numbers in the Mojave Desert to decline

so rapidly as to have prompted their emergency listing as a threatened species by the USFWS. The spread of this disease is suspected by some to be linked to pressures on the desert tortoise by human incursions into desert tortoise habitat; however, there is debate within the scientific community as to the exact nature of URTD and its origins or causes. Within or adjacent to populated areas of Washington County, it is speculated that desert tortoise populations have declined due to road kills, predation by dogs, and degradation of habitat, but the extent of URTD in Washington County remains unclear. Apparently one individual tortoise was documented with the disease by UDWR. Translocation efforts provided by the HCP include examinations for URTD, which should generate the information needed to understand how common this disease is in Washington County.

2.1.2 Bald Eagle

In Washington County, most observations of bald eagles are along the Virgin and Santa Clara Rivers and bodies of water associated with these rivers. Special use areas include Quail Creek Reservoir, Hurricane sewer ponds, Baker Dam Reservoir, Sand Cove Reservoir, Gunlock Reservoir, Ivins Reservoir, and Ash Creek Reservoir (BLM 1990; Jensen 1991). Foraging areas for the bald eagle have been documented by wildlife management officials. An approved Recovery Plan exists for the bald eagle.

2.1.3 Peregrine Falcon

Peregrine falcons are found in Washington County in Zion National Park, at Welcome Spring, near the south end of the Beaver Dam Mountains, and at the Red Cliffs Recreation Area in the high cliffs which provide nest and roost sites for the falcons (Jensen 1991). A Recovery Plan has been approved for the peregrine falcon.

2.1.4 Mexican Spotted Owl

Eleven mating pairs and three individuals of Mexican spotted owls have been found in Zion National Park, and sightings have been recorded from northeastern Washington County on BLM lands near Zion National Park (pers. comm., S. Rinkevich [USFWS], 1992; pers. comm., R. Douglas [BLM], 1992). Surveys on the Dixie National Forest have yet to positively confirm any Mexican spotted owls. A draft Recovery Plan for the Mexican spotted owl has been prepared and work is beginning on a final plan; however, management guidelines have been issued by the USFWS (pers. comm., M. Zablan [USFWS], 1992).

2.1.5 Southwestern Willow Flycatcher

The southwestern willow flycatcher was listed as endangered in March 1995. The species is also considered a State sensitive species. The flycatcher is a small, brownish-olive bird with a pale olive breast and a pale yellow belly, whose spring and summer range is the southwestern United States (Unitt 1987). This species uses low to mid-elevation and stream habitats, generally nesting among willow or reed thickets, but inhabiting forested, wetlands, and

rangeland during other parts of the year. Flycatchers feed primarily on insects, seeds, and berries. Their winter range is from southern Mexico to Panama (Ehrlich et al. 1988). Southwestern willow flycatchers have been recorded along the Virgin and Santa Clara Rivers. While habitat with vegetation similar to that in known breeding areas exists along these rivers, no breeding populations or nests have been documented (pers. comm., R. Fridell [UDWR], 1992). However, summer records of this species imply the possibility of breeding in the area.

2.1.6 Woundfin and Virgin River Chub

The use areas of the woundfin and Virgin River chub are restricted to the Virgin River from LaVerkin Springs to Lake Mead. Many in-depth surveys have been conducted concerning the Virgin River fishes. Locations of known habitat for these species are presented in Figure 2.2. A Recovery Plan for the Virgin River fishes has been prepared (USFWS 1995), and a Conservation Agreement (UDWR/USFWS 1995) has been signed for the Virgin Spinedace.

2.1.7 Dwarf Bear-Claw Poppy and Siler Pincushion Cactus

Two plant species, one endangered and one threatened, also inhabit Washington County: the dwarf bear-claw poppy and the Siler pincushion cactus. The known habitat of these plants, clay soils in the Moenkopi Formation, lies south and west of St. George (Figure 2.2). Approximately 90 percent of the habitat of the two species is on BLM and Utah State School Trust lands. These plants are currently imperiled by off-highway vehicle (OHV) use. A transect study was carried out by Dr. Arthur Phillips, a botanist who aided in the preparation of the Recovery Plan for the Siler pincushion cactus (Phillips et al. 1979). Information from this study correlates with previous USFWS studies and surveys undertaken by BLM. Table 2.2 presents land ownership for all known locations within Washington County for these two listed plant species.

Table 2.2. Land Ownership Acreages for the Two Listed Plant Species.

Ownership	Siler Cactus (acres)	Dwarf Bear-Claw Poppy (acres)	Both Species (acres)	Total (acres)
Private	35	273	0	308
State	0	2,675	274	2,949
BLM	811	4,962	903	6,676
BIA	0	185	0	185
Totals	846	8,095	1,177	10,118

2.1.8 Candidate Species

Over 40 species occurring in Washington County are considered candidates for Federal listing and many others are State sensitive. Six additional species are likely to be considered for listing in the near future. These include the spotted bat, Shem milk-vetch, Holmgren milk-vetch,

Bonneville cutthroat trout (an introduced species), wet rock physa (also known as the Zion Canyon snail), and Virgin Spinedace. The Virgin spinedace, a proposed threatened species, will be downlisted to a candidate species pursuant to a Conservation Agreement with the Washington County Water District and the State of Utah. None of these six species are known or thought to occur in the areas identified for incidental take. While the shem milk-vetch, a Candidate 2 species recommended for a Federal status change to Candidate 1, will not be affected by the HCP. it is of great concern as more than 50% of its population has been destroyed in the past year. There are four remaining populations of shem milk-vetch in Washington County, all of them extremely small. None of the populations fall within the proposed HCP reserve or take areas. and hence, will not be affected, either adversely or beneficially, by the HCP. Some protection is offered to the two populations that occur on BLM lands through Federal management strategies while the population on the Paiute Tribal Lands and the one on State lands will receive no protection. Candidate and State sensitive species are discussed in greater detail in Chapter 8.

In addition to the Mojave desert tortoise and the peregrine falcon, the following Federal candidate and State sensitive species are expected to benefit from the creation and management of the proposed reserve: Merriam's kangaroo rat, pygmy rabbit, ferruginous hawk, loggerhead shrike. chuckwalla. Gila monster, Utah banded gecko, lyre snake, western blind snake, and sidewinder.

2.2 GUIDING PRINCIPLES

The application of habitat conservation strategies to the Washington County area, in concert with a limited amount of development, will be guided by a broad set of conservation and planning principles. defined herein. These principles are formulated to maximize the probability of this HCP's success in conserving threatened and endangered as well as candidate species of interest and the overall ecological fabric of the County. Each specific conservation technique applied to the areas affected by the HCP will be in accordance with these principles.

Preservation of existing ecological values is one of the foremost objectives of the HCP. The ecological values to be preserved comprise all of the features of the HCP areas which result from their unusual climate, varied topography, and relative freedom from urban development. These values include the endangered, threatened, and candidate species of concern; the Mojave Desert vegetation which provides food and cover for these and many other species; and the relatively untrammeled areas which provide scenic splendor for Washington County inhabitants and visitors. Since many areas have recently experienced the increasing effects of human activity. such as livestock grazing, roads, OHV use, and other urban activities, the ecological value of the area has been reduced from its "pristine" condition. Nonetheless, since it is extremely difficult to theoretically reconstruct what this ancestral condition would have been, and virtually impossible to recreate it, a realistic and much more workable goal is to attempt to preserve the existing known values of present-day Mojave Desert habitat in Washington County.

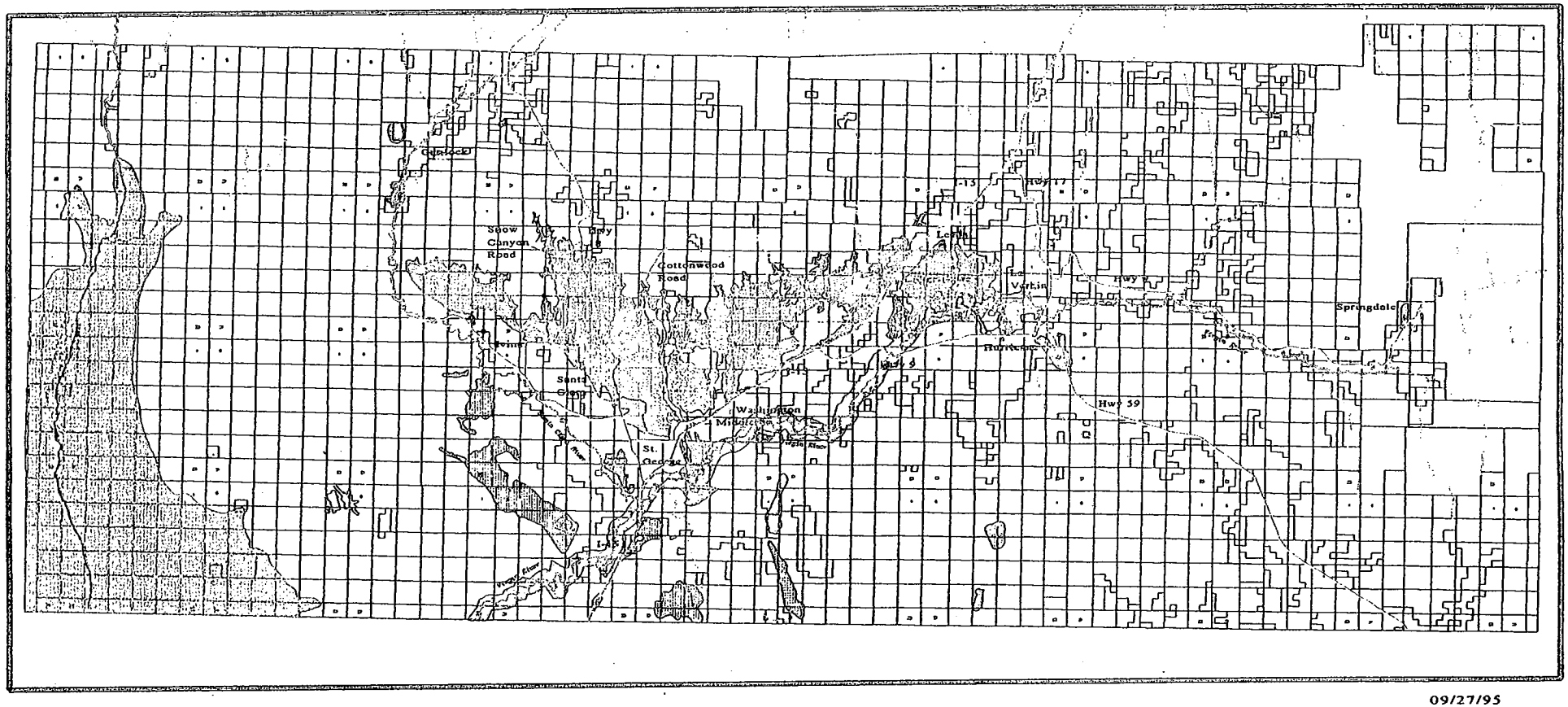


Figure 2.2. Distribution of Threatened and Endangered Species in Washington County.

A second guiding principle is to preserve existing biodiversity. Part of the ecological value is the multitude of species of animals, birds, fishes, and plants making the County their home. This diversity is reflected in the very occurrence of the numerous species of special concern. Diversity is also related to stability in ecological systems. The role of diversity in ecosystem stability is one of the basic principles reflected in the Act itself. In a broad sense, part of the purpose of the Washington County HCP is to reserve the stability of biological systems by offsetting a tendency toward loss of diversity. Humans are part of the biological system and derive from it not only their existence, but—in varying degrees—some quality of life as well. At times, this quality of life is based on the mere knowledge that the natural community exists.

The principle of reliance on preservation (as opposed to manipulation or restoration) is also important. Preservation of existing ecological conditions is preferable to attempting to recreate these conditions after disturbance for several reasons. Preservation is less expensive than restoration. Additionally, it is always uncertain whether a restoration or habitat enhancement effort will produce the desired result or whether it will adversely affect another species. Preservation also maintains areas which draw human visitors by maintaining aesthetic values. Enhancement of existing habitat is justified in some areas, when it can be shown that the enhancement reverses past disturbance and/or accelerates the rate of natural recovery from disturbance. Thus in reserved areas impacted by grazing, roads, OHV trails and other disturbances, enhancement can improve the chances for a species' survival in perpetuity. Habitat enhancement measures currently considered viable include the fencing of desert tortoise reserve areas to allow for natural healing and revegetation. It also includes the purchase and retirement of grazing permits to eliminate any potential adverse impact from livestock, the restriction or elimination of other competing uses, and the creation of reserves where protection of other Federally listed species is a primary management objective.

CHAPTER 3.0
RESERVE

3.1 INTRODUCTION

The central element of this HCP is the creation of a Mojave Desert habitat reserve in Washington County. This proposed reserve will be 61,022 acres in size and will be managed for the protection of the Mojave desert tortoise and other listed, candidate, and sensitive species found in these same habitat areas. The proposed reserve is consistent with that recommended in the DTRP, and its boundaries have been drawn with generally accepted reserve design criteria (see Chapter 7 for an in-depth analysis of the reserve boundaries against these criteria). The proposed boundaries of the reserve are presented in Figure 3.1, and current land ownership and desert tortoise habitat within the proposed reserve are enumerated in Table 3.1. This Chapter details the acquisition strategy for the proposed reserve and identifies management strategies for each unit of the reserve and current landowners.[1]

Table 3.1. Land Ownership and Desert Tortoise Habitat in the Proposed Reserve.

Desert tortoise Density	Private/ Municipal/ Roads (acres)	School Trust (acres)	BLM (acres)	Snow Canyon State Park (acres)	Total (acres)
High	4,299	4,236	4,164	204	12,903
Medium	1,023	2,501	1,913	0	5,437
Low	1,727	3,357	12,621	2,742	20,447
None	622	844	19,336	1,433	22,235
Total	7,671	10,938	38,034	4,379	61,022

3.2 ACQUISITION STRATEGY

As illustrated in Table 3.1, approximately two-thirds of the proposed reserve is under BLM or State Park ownership. The remaining third comprises parcels currently under State or private ownership that are needed to make the reserve contiguous and effective. Three acquisition strategies have been identified to facilitate the acquisition of these necessary private and State School Trust lands. Due to the long time frame for their completion, all three have been initiated and are being pursued simultaneously. Land will be acquired or exchanged upon the principle of a willing seller and willing buyer. Landowners have been consulted throughout the

[1] Parcel data and land ownership information were obtained from a variety of sources, including the Washington County Assessor's Office, the BLM, and the Division of State Lands and Forestry. While every effort has been made to make the lists contained herein as accurate and as current as possible, land ownership information is a dynamic process and the Washington County Commission does not guarantee the accuracy of any of the land ownership information in this document.

HCP process and have been encouraged to participate in these land exchanges. In the event they do not, the HCP will have no legal effect on their property and the HCP will place no restrictions on land use within the reserve. However, such lands will not participate in the benefits and protections inherent in an incidental take permit issued as a part of this HCP, and therefore the landowner will be subject to the Section 9 enforcement provisions under the Act. For those landowners that do participate, three acquisition processes will be used. These are briefly described below.

3.2.1 State School Trust-BLM Land Exchange

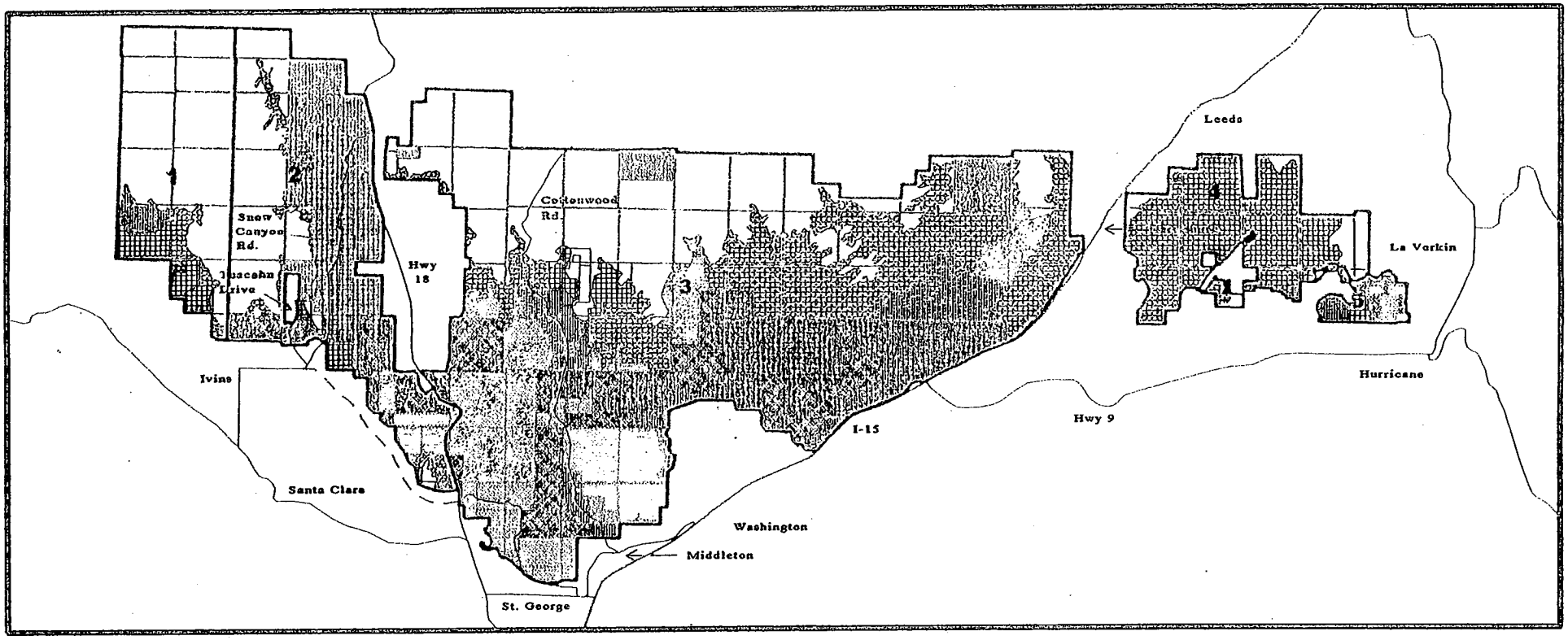
The Division of State Lands and Forestry (Division) has entered into an Memorandum of Understanding (MOU) with the BLM to guide the exchange of lands within the proposed reserve boundaries for BLM lands elsewhere in the State of Utah. Currently, the respective agencies have prepared lists of desired properties and are completing appraisal instructions. It is possible that the Division may desire to retain title to some lands within the reserve, and discussions are being held between the agencies regarding conservation easements or other protective measures which could achieve similar objectives to land exchange. State School Trust lands are also encumbered with various leases and easements. Land acquisition is encouraged, but conservation easements for fulfillment of the permit are acceptable if entered into in perpetuity or as long as such protection is required by the ESA, whichever is less. Through the land exchange process conservation easements which are incompatible with reserve management objectives will have to be reconciled.

3.2.2 Private-BLM Land Exchange

Most of the larger private landowners within the proposed reserve have agreed to enter into a land exchange with the BLM for lands elsewhere in the Southwest. Unlike the land exchange discussed above, this private-BLM land exchange is envisioned as one large transaction. The HCP Steering Committee has retained both real estate and legal consultants to facilitate the exchange. Currently most of the private landowners within the proposed reserve boundaries have agreed to participate in this acquisition program. Congressional, State and local government and environmental group support has also been sought and received for this exchange.

3.2.3 Land and Water Conservation Fund

The Land and Water Conservation Fund (L&WCF) is a dedicated Federal trust fund whose monies can be used for acquisition of private and municipal lands for outdoor recreation, wildlife habitat, and threatened and endangered species preservation. The Steering Committee, in concert with the BLM and USFWS, submitted a joint funding request for fiscal year 1995 for $7,000,000 for land acquisition. The HCP budget includes a matching grant of $1,000,000 for land acquisition. To our knowledge, this is the first matching grant ever proposed to the L&WCF. If the majority of the lands can be acquired through land exchange, substantially less money from the fund would be necessary. If, on the other hand, the private-BLM land



- Private/Other
- State of Utah
- BLM
- Snow Canyon State Park
- Highway/Road ROW
- Municipal
- Proposed DWMA Boundary
- Proposed Skyline Drive
- Low Tortoise Density
- Medium Tortoise Density
- High Tortoise Density

10/02/95

N

3000 0 3000 6000 meters

Figure 3.1. Proposed Reserve Boundaries

exchange were to prove unsuccessful, these monies would help to acquire some of the proposed reserve. The fund probably would not be sufficient to acquire all the private parcels, and additional requests to L&WCF would be made in subsequent years.

3.3 DESCRIPTION AND MANAGEMENT OF RESERVE ZONES

The proposed reserve is divided into five zones based on management goals. These zones are depicted in Figure 3.1. The five zones are described, parcel information is identified, and management recommendations are illustrated in the following paragraphs, figures, and tables. In all management zones, free-roaming dogs or feral animals would not be allowed in any of the reserve areas.

3.3.1 Zone 1: Paiute Indian Tribal Lands to Ivins

3.3.1.1 Description

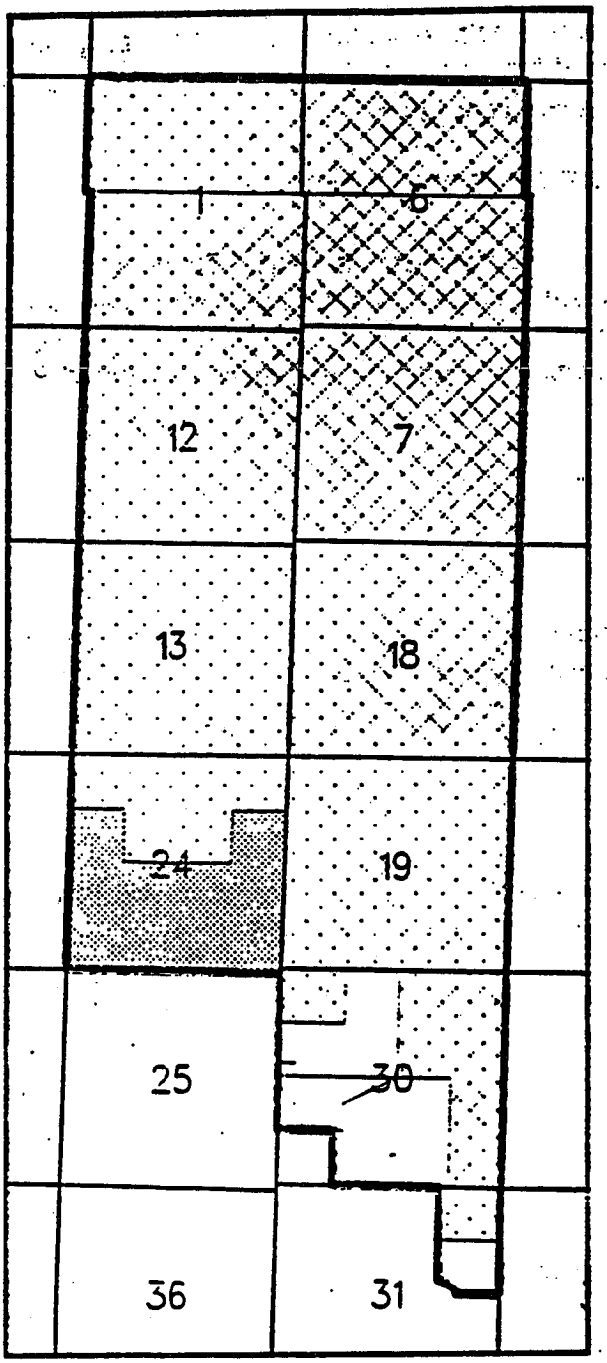
Zone 1 covers the area from the Paiute Indian Tribal Lands to Ivins, which is predominantly within the incorporated boundaries of the Town of Ivins. This area entails approximately 6,146 acres of land predominantly managed by the BLM. Figure 3.2 illustrates the general land ownership within this zone, while Table 3.2 details the land ownership information.

3.3.1.2 Management

The management goal for Zone 1 is to allow for low-density development consistent with habitat protection. Management of Zone 1 will be the responsibility of the Town of Ivins and where applicable, BLM. Management of resources on BLM administered public lands not directly related to desert tortoise objectives, including management of wilderness values on Red Mountain will remain with BLM. Prescriptions on public lands must conform to Federal laws and regulations. Management will primarily entail land use restrictions which have been developed to preserve and enhance Mojave desert tortoise habitat. These restrictions will include the following:

- A maximum overall density of one unit per acre.
- Minimized surface disturbance during development.
- Retention of native vegetation and restrictions on exotic plant materials.
- Firefighting should be allowed.
- No grazing will be allowed in desert tortoise habitat.

The existing Kayenta Development in this area follows these restrictions and is a graphic example of actual development which may co-exist with desert tortoises in this zone.



Private

Private/Developed

Bureau of Land Management

09/27/9

Figure 3.2. Zone 1: Paiute Indian Reservation to Ivins

Table 3.2. Parcel Information for Zone 1 of the Proposed Reserve.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	06	BLM	BUREAU OF LAND MANAGEMENT	413.19
T.41S.	R.16W.	06	BLM	BUREAU OF LAND MANAGEMENT	348.81
T.41S.	R.16W.	07	BLM	BUREAU OF LAND MANAGEMENT	668.44
T.41S.	R.16W.	18	BLM	BUREAU OF LAND MANAGEMENT	674.97
T.41S.	R.16W.	19	BLM	BUREAU OF LAND MANAGEMENT	662.10
T.41S.	R.16W.	30	7276-A-NP	R.T. MARTIN	118.13
T.41S.	R.16W.	30	7276-B-NP	R.T. MARTIN	9.13
T.41S.	R.16W.	30	7276-C-NP	R.C. & ARLEEN ANN TOLMAN	148.11
T.41S.	R.16W.	30	7276-D	ST. GEORGE & S.C. BENCH IRRIG. Co.	6.10
T.41S.	R.16W.	30	7276-D-NP	IVINS TOWN INC.	3.73
T.41S.	R.16W.	30	7276-E	R.T. MARTIN	57.54
T.41S.	R.16W.	30	BLM	BUREAU OF LAND MANAGEMENT	240.28
T.41S.	R.16W.	30	BLM	BUREAU OF LAND MANAGEMENT	47.72
T.41S.	R.16W.	31	7277-A	WILLIAMS CARMA & ASSOCIATION INC.	5.76
T.41S.	R.16W.	31	7278-N	IVINS TOWN INC.	42.73
T.41S.	R.16W.	31	BLM	BUREAU OF LAND MANAGEMENT	38.77
T.41S.	R.17W.	01	BLM	BUREAU OF LAND MANAGEMENT	410.35
T.41S.	R.17W.	01	BLM	BUREAU OF LAND MANAGEMENT	334.78
T.41S.	R.17W.	12	BLM	BUREAU OF LAND MANAGEMENT	639.80
T.41S.	R.17W.	13	BLM	BUREAU OF LAND MANAGEMENT	633.90
T.41S.	R.17W.	24	BLM	BUREAU OF LAND MANAGEMENT	242.01
T.41S.	R.17W.	24	KAYENTA	TERRY MARTIN	400.57

3.3.2 Zone 2: Ivins to Highway 18

3.3.2.1 Description

Zone 2 covers the area from Ivins to Highway 18, which is predominantly within unincorporated areas of the County as well as incorporated areas in the City of St. George. This area includes 10,372 acres, of which 4,326 are within Snow Canyon State Park and 3,787 are managed by the BLM. Figure 3.3 illustrates the general land ownership within this Zone, while Table 3.3 details the land ownership information.

3.3.2.2 Management

The management goal for Zone 2 is desert tortoise habitat protection and environmental education. It is envisioned that private and State School Trust lands within Zone 2 would be acquired by the BLM through exchange; however, it is the intention of the State, County, and cities that the exchange legislation require the BLM to transfer the land to the UDNR for management as an extension of Snow Canyon State Park and/or to support a regional education center. Mitigation measures applicable to this zone will include land acquisition, fencing of Highway 18, law enforcement, and environmental education. The following management regulations are recommended for Zone 2:

- Hiking, equestrian use, and hunting including other non-consumptive recreational activities should be restricted to designated trails.
- The BLM should be requested to apply for mineral withdrawal for Federal minerals.
- Non-intrusive monitoring of desert tortoise population dynamics should be allowed.
- Maintenance of existing utilities including roads should be allowed.
- Speed restrictions on the Tuacahn Road should be enforced.
- Organized or competitive sporting or recreational events should not be allowed, although guided or controlled tours to enhance education may be permissible.[2]
- Desert tortoise translocation should not be permitted except as authorized under approved translocation projects.
- Existing governmental uses within Zone 2 may continue.
- Firefighting should be allowed.
- No grazing will be allowed in desert tortoise habitat.

The Education Committee, in searching for a location for the Education Center that is removed from any tortoise populations, has discussed the southern part of Paradise Canyon as a tentative location. Paradise Canyon has received attention as a potential site for the Education Center because the County seriously committed to building the Center in this canyon as a result of multiple city concurrence that the reserve be extended west of Hwy 18. This point was a major incentive to making the reserve significantly larger in this general area and likely would not have happened without the intent of an Education Center in Paradise Canyon.

Also, critical to the proposed establishment of a Center in Paradise Canyon is the exchange of this privately-held property to the BLM. The property is largely owned by Amsco Windows. Any land exchange realistically is one to three years away, assuming it occurs. Other sites that have also been raised as alternatives include Snow Canyon State Park and Cottonwood Springs

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[2] An organized recreational activity is any scheduled event with a specific planned purpose. Those organized recreational activities which conflict with the intended protection of the desert tortoise or, due to the nature of the event, are unable to provide the degree of supervision necessary to prevent harm to desert tortoises or prevent damage to habitat will not be permitted within the reserve area. The reserve manager will be the entity authorized to determine the suitability of organized activities within the reserve area. Any entity denied permission to use the reserve area can appeal the decision to the HCAC. The HCP recognizes the proposed Tuacahn project in Zone 2, including use of the entrance road. The prohibition against organized recreational activities does not apply to use on existing, improved roads within the reserve.

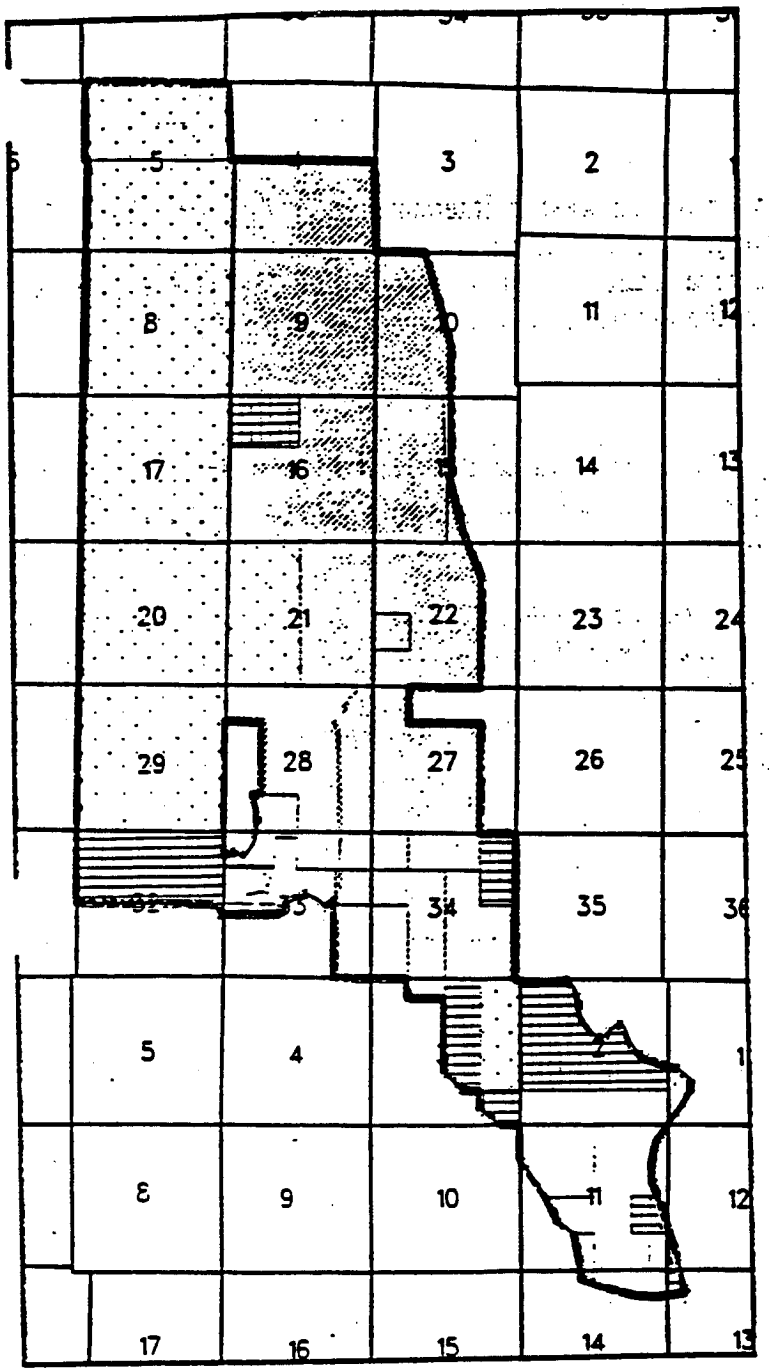
(at I-15 and Hwy 9 junction). At this time, it is uncertain where the Education Center will be built. The Education Committee and the County strongly feel that the Center and its location be designed and built not only in an ecologically acceptable manner, but that it not impact the reproduction or mortality of tortoises which may be in close proximity. If an Education Center is established at one of the above sites, it may be prudent not to designate such a site as a "drop-off" point for tortoises recovered by the public on the basis that such animals could be diseased and might inadvertently infect nearby, wild populations. The County is exploring establishing a "drop-off" point directly with a qualified veterinarian.

Table 3.3. Parcel Information for Zone 2 of the Proposed Reserve.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	04	SNOW	SNOW CANYON STATE PARK	387.89
T.41S.	R.16W.	05	BLM	BUREAU OF LAND MANAGEMENT	399.41
T.41S.	R.16W.	05	BLM	BUREAU OF LAND MANAGEMENT	328.28
T.41S.	R.16W.	08	BLM	BUREAU OF LAND MANAGEMENT	644.92
T.41S.	R.16W.	09	SNOW	SNOW CANYON STATE PARK	635.23
T.41S.	R.16W.	10	SNOW	SNOW CANYON STATE PARK	293.68
T.41S.	R.16W.	15	7257-A	UTAH STATE PARK & RECREATION	14.27
T.41S.	R.16W.	15	ROW	HIGHWAY/ROAD ROW	30.41
T.41S.	R.16W.	15	SNOW	SNOW CANYON STATE PARK	305.54
T.41S.	R.16W.	16	SNOW	SNOW CANYON STATE PARK	529.01
T.41S.	R.16W.	16	STATE	STATE OF UTAH	107.07
T.41S.	R.16W.	17	BLM	BUREAU OF LAND MANAGEMENT	646.44
T.41S.	R.16W.	20	BLM	BUREAU OF LAND MANAGEMENT	636.53
T.41S.	R.16W.	21	BLM	BUREAU OF LAND MANAGEMENT	318.95
T.41S.	R.16W.	21	SNOW	SNOW CANYON STATE PARK	318.17
T.41S.	R.16W.	22	7259-C	UTAH STATE PARK & RECREATION	420.92
T.41S.	R.16W.	22	7259-NP	UTAH STATE PARK & RECREATION	39.69
T.41S.	R.16W.	22	ROW	HIGHWAY/ROAD ROW	6.96
T.41S.	R.16W.	27	SNOW	SNOW CANYON STATE PARK.	397.82
T.41S.	R.16W.	28	7275-NP	UTAH STATE PARK & RECREATION	133.53
T.41S.	R.16W.	28	7275-NP	UTAH STATE PARK & RECREATION	342.80
T.41S.	R.16W.	28	I-6-1-28-3000	HYRUM SMITH	46.38
T.41S.	R.16W.	28	ROW	HIGHWAY/ROAD ROW	9.76
T.41S.	R.16W.	29	BLM	BUREAU OF LAND MANAGEMENT	649.68
T.41S.	R.16W.	32	7279-TR	UTAH STATE	319.22
T.41S.	R.16W.	32	I-SB-19-A	WESTON HAFEN FAMILY PRTNRSHP	0.95
T.41S.	R.16W.	32	I-SB-19-A	WESTON HAFEN FAMILY PRTNRSHP	0.58
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	0.60
T.41S.	R.16W.	33	7282-A-1	SNOW CANYON STATE PARK	2.33
T.41S.	R.16W.	33	7282-A-1	SNOW CANYON STATE PARK	33.84
T.41S.	R.16W.	33	7282-A-2	WOODRUFF D. & PENNIE SPROUL TR	33.45
T.41S.	R.16W.	33	7282-A-2	WOODRUFF D. & PENNIE SPROUL TR	46.71
T.41S.	R.16W.	33	7282-A-3	THORLEY CATTLE COMPANY	80.15
T.41S.	R.16W.	33	I-6-1-33-13001	CARROLL KUNTZ	82.46
T.41S.	R.16W.	33	I-6-1-33-2401	ROBERT AND BEVERLEE MURRAY	1.38
T.41S.	R.16W.	33	I-6-1-33-3300	ROBERT AND BEVERLEE MURRAY	12.95
T.41S.	R.16W.	33	I-6-1-33-4000	HYRUM SMITH	36.70

Table 3.3 (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	33	I-6-1-33-4001	ROBERT AND BEVERLEE MURRAY	2.79
T.41S.	R.16W.	33	I-6-1-33-4200	ROBERT AND BEVERLEE MURRAY	2.94
T.41S.	R.16W.	33	I-6-1-33-4200	ROBERT AND BEVERLEE MURRAY	38.60
T.41S.	R.16W.	33	I-6-1-33-4202	ROBERT AND BEVERLEE MURRAY	0.65
T.41S.	R.16W.	33	I-6-1-33-4203	ROBERT AND BEVERLEE MURRAY	4.13
T.41S.	R.16W.	33	I-6-1-33-4204	ROBERT AND BEVERLEE MURRAY	4.06
T.41S.	R.16W.	33	I-6-1-33-4400	ROBERT AND BEVERLEE MURRAY	3.89
T.41S.	R.16W.	33	ROW	HIGHWAY/ROAD ROW	1.05
T.41S.	R.16W.	33	ROW	HIGHWAY/ROAD ROW	2.31
T.41S.	R.16W.	33	ROW	HIGHWAY/ROAD ROW	1.82
T.41S.	R.16W.	34	7253-NP	UTAH STATE PARK & RECREATION	194.39
T.41S.	R.16W.	34	7253-NP	UTAH STATE PARK & RECREATION	40.07
T.41S.	R.16W.	34	7283	SNOW CANYON STATE PARK	158.11
T.41S.	R.16W.	34	7283-B	THORLEY CATTLE COMPANY	79.75
T.41S.	R.16W.	34	7283-NP	UTAH STATE PARKS & RECREATION	79.87
T.41S.	R.16W.	34	STATE	STATE OF UTAH	77.74
T.42S.	R.16W.	01	BLM	BUREAU OF LAND MANAGEMENT	27.31
T.42S.	R.16W.	02	ROW	HIGHWAY/ROAD ROW	7.05
T.42S.	R.16W.	02	SG-6-2-2-110	STATE OF UTAH	313.70
T.42S.	R.16W.	02	SG-6-2-2-221	AMSCO WINDOWS	154.90
T.42S.	R.16W.	03	7288-A	A H GUBLER (HOLDINGS)	21.80
T.42S.	R.16W.	03	BLM	BUREAU OF LAND MANAGEMENT	135.26
T.42S.	R.16W.	03	STATE	STATE OF UTAH	115.31
T.42S.	R.16W.	03	STATE	STATE OF UTAH	37.27
T.42S.	R.16W.	11	ROW	HIGHWAY/ROAD ROW	7.35
T.42S.	R.16W.	11	ROW	HIGHWAY/ROAD ROW	7.70
T.42S.	R.16W.	11	SG-6-2-11-110	AMSCO WINDOWS	264.61
T.42S.	R.16W.	11	SG-6-2-11-220	SANTA FE LAND DEV CORP.	19.88
T.42S.	R.16W.	11	SG-6-2-11-312	AMSCO WINDOWS	3.69
T.42S.	R.16W.	11	SG-6-2-11-313	AMSCO WINDOWS	17.55
T.42S.	R.16W.	11	SG-6-2-11-410	AMSCO WINDOWS	147.46
T.42S.	R.16W.	11	STATE	STATE OF UTAH	28.93
T.42S.	R.16W.	12	BLM	BUREAU OF LAND MANAGEMENT	<0.01
T.42S.	R.16W.	12	ROW	HIGHWAY/ROAD ROW	7.70
T.42S.	R.16W.	12	STATE	STATE OF UTAH	2.70
T.42S.	R.16W.	13	ROW	HIGHWAY/ROAD ROW	4.25
T.42S.	R.16W.	13	STATE	STATE OF UTAH	8.80
T.42S.	R.16W.	14	SG-6-2-11-110	AMSCO WINDOWS	20.93
T.42S.	R.16W.	14	SG-6-2-14-111	AMSCO WINDOWS	14.21
T.42S.	R.16W.	14	SG-6-2-14-112	SANTA FE LAND DEV CORP.	14.26
T.42S.	R.16W.	14	SG-6-2-14-411	AMSCO WINDOWS	3.92



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09/27/95

Figure 3.3. Zone 2: Ivins to Highway 18

3.3.3 Zone 3: Core Zone

3.3.3.1 Description

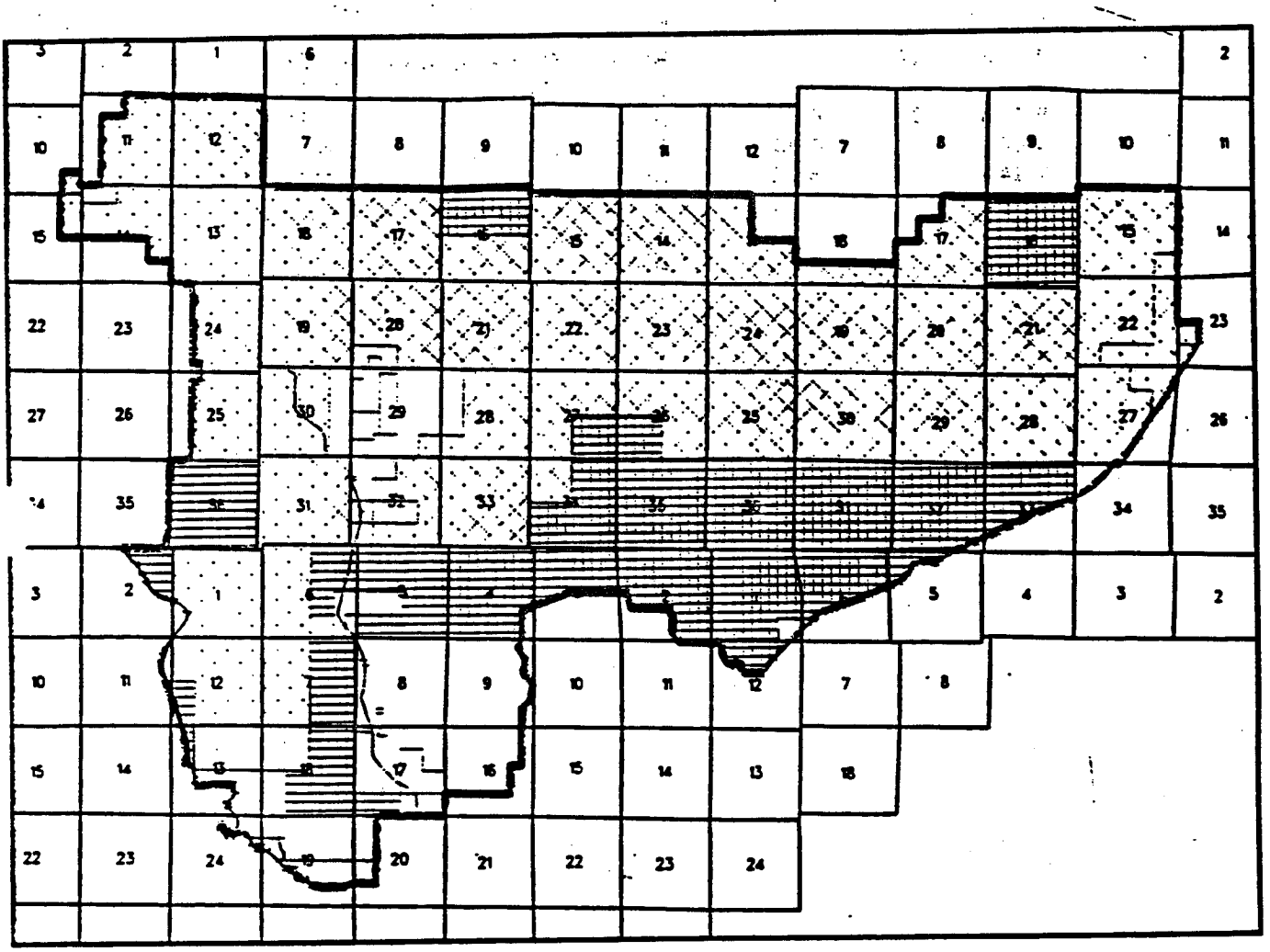
Zone 3 covers the area from Highway 18 on the west to Interstate 15 on the east. Table 3.4 presents detailed land ownership information for Zone 3, and Figure 3.4 presents zone boundaries and general ownership. This area entails 38,541 acres, of which 23,571 are managed by the BLM and 9,927 are managed by the Division of State Lands and Forestry.

3.3.3.2 Management

Zone 3 will be managed by the Dixie Resource Area of the BLM for the preservation and enhancement of the Mojave desert tortoise. The BLM will prepare a management plan for this area. Grazing permits will be acquired and retired on a willing buyer-willing seller basis.

Mitigation measures applicable to this zone include land acquisition; fencing Highway 18, Interstate 15, Skyline Drive, the area around North Washington City, and portions of the area around North St. George; acquisition of grazing permits; law enforcement; HCP financial assistance to the BLM for management purposes; and environmental education. The following management principles are recommended for Zone 3:

- Hiking, equestrian, and camping should be restricted to designated areas.
- The BLM should be requested to apply for mineral withdrawal for Federal minerals.
- No organized or competitive sporting or recreational events should be allowed.
- Grazing permits should be acquired and retired.
- New utility development should be encouraged to be conducted during the winter months when the desert tortoise is not active.
- Hunting should be restricted to big game or upland birds during official seasons.
- Existing governmental uses, such as the City of St. George's pistol range, the debris basin behind City Creek dam, and Pioneer Park should be allowed to continue. Expansion of use of Pioneer Park outside of the existing developed area will be subject to HCAC approval of a desert tortoise management plan.
- Vehicles should be restricted to designated roads.
- Continuation of present activities associated with the Moroni Feeds Turkey Farm should be permitted but new actions, which the reserve manager reasonably believes may harm the desert tortoise, should not be allowed.



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09/27/95

Figure 3.4. Zone 3: Highway 18 to Interstate 15

Table 3.4. Parcel Information for Zone 3 of the Proposed Reserve.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.14W.	15	BLM	BUREAU OF LAND MANAGEMENT	649.73
T.41S.	R.14W.	15	BLM	BUREAU OF LAND MANAGEMENT	44.86
T.41S.	R.14W.	16	STATE	STATE OF UTAH	654.12
T.41S.	R.14W.	17	BLM	BUREAU OF LAND MANAGEMENT	514.09
T.41S.	R.14W.	18	BLM	BUREAU OF LAND MANAGEMENT	175.33
T.41S.	R.14W.	19	BLM	BUREAU OF LAND MANAGEMENT	697.60
T.41S.	R.14W.	20	BLM	BUREAU OF LAND MANAGEMENT	630.70
T.41S.	R.14W.	21	BLM	BUREAU OF LAND MANAGEMENT	639.52
T.41S.	R.14W.	22	BLM	BUREAU OF LAND MANAGEMENT	259.48
T.41S.	R.14W.	22	BLM	BUREAU OF LAND MANAGEMENT	435.78
T.41S.	R.14W.	23	4060-A	UNITED STATES OF AMERICA	39.51
T.41S.	R.14W.	23	BLM	BUREAU OF LAND MANAGEMENT	23.57
T.41S.	R.14W.	26	BLM	BUREAU OF LAND MANAGEMENT	3.69
T.41S.	R.14W.	27	4065-A	UNITED STATES OF AMERICA	108.03
T.41S.	R.14W.	27	BLM	BUREAU OF LAND MANAGEMENT	483.48
T.41S.	R.14W.	28	BLM	BUREAU OF LAND MANAGEMENT	635.12
T.41S.	R.14W.	29	BLM	BUREAU OF LAND MANAGEMENT	644.14
T.41S.	R.14W.	30	BLM	BUREAU OF LAND MANAGEMENT	694.84
T.41S.	R.14W.	31	STATE	STATE OF UTAH	700.61
T.41S.	R.14W.	32	STATE	STATE OF UTAH	629.17
T.41S.	R.14W.	33	STATE	STATE OF UTAH	381.13
T.41S.	R.14W.	34	BLM	BUREAU OF LAND MANAGEMENT	63.28
T.41S.	R.14W.	34	ROW	HIGHWAY/ROAD ROW	<0.01
T.41S.	R.14W.	34	ROW	HIGHWAY/ROAD ROW	0.01
T.41S.	R.15W.	13	BLM	BUREAU OF LAND MANAGEMENT	480.33
T.41S.	R.15W.	14	BLM	BUREAU OF LAND MANAGEMENT	639.38
T.41S.	R.15W.	15	BLM	BUREAU OF LAND MANAGEMENT	652.60
T.41S.	R.15W.	16	BLM	BUREAU OF LAND MANAGEMENT	331.73
T.41S.	R.15W.	16	STATE	STATE OF UTAH	344.14
T.41S.	R.15W.	17	BLM	BUREAU OF LAND MANAGEMENT	656.63
T.41S.	R.15W.	18	BLM	BUREAU OF LAND MANAGEMENT	664.39
T.41S.	R.15W.	19	BLM	BUREAU OF LAND MANAGEMENT	664.84
T.41S.	R.15W.	20	6206	MORONI FEED CO.	10.71
T.41S.	R.15W.	20	6210-B-NP	NORMAN L. BLAKE	70.45
T.41S.	R.15W.	20	BLM	BUREAU OF LAND MANAGEMENT	557.94
T.41S.	R.15W.	21	BLM	BUREAU OF LAND MANAGEMENT	640.78
T.41S.	R.15W.	22	BLM	BUREAU OF LAND MANAGEMENT	636.10
T.41S.	R.15W.	23	BLM	BUREAU OF LAND MANAGEMENT	642.75
T.41S.	R.15W.	24	BLM	BUREAU OF LAND MANAGEMENT	638.03
T.41S.	R.15W.	25	BLM	BUREAU OF LAND MANAGEMENT	628.90
T.41S.	R.15W.	26	BLM	BUREAU OF LAND MANAGEMENT	484.18
T.41S.	R.15W.	26	STATE	STATE OF UTAH	158.10
T.41S.	R.15W.	27	BLM	BUREAU OF LAND MANAGEMENT	472.35
T.41S.	R.15W.	27	STATE	STATE OF UTAH	160.96
T.41S.	R.15W.	28	6207	TOM/DORA, NORM&EILEEN, BLAKE	119.11
T.41S.	R.15W.	28	BLM	BUREAU OF LAND MANAGEMENT	520.19
T.41S.	R.15W.	29	6206	MORONI FEED CO.	88.85

Table 3.4. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	01	W-5-2-1-121	LOLA SULLIVAN, TR	38.27
T.42S.	R.15W.	02	STATE	STATE OF UTAH	535.20
T.42S.	R.15W.	03	6213-TR	STATE OF UTAH	321.80
T.42S.	R.15W.	04	STATE	STATE OF UTAH	611.55
T.42S.	R.15W.	05	6001-NP	UTAH STATE	168.11
T.42S.	R.15W.	05	6100-NP	ST. GEORGE CITY	84.06
T.42S.	R.15W.	05	6213-TR	STATE OF UTAH	84.65
T.42S.	R.15W.	05	6213-TR	STATE OF UTAH	336.11
T.42S.	R.15W.	06	6200-NP	UTAH STATE	181.62
T.42S.	R.15W.	06	6200-NP	UTAH STATE	29.42
T.42S.	R.15W.	06	6250-NP	ST. GEORGE CITY	32.54
T.42S.	R.15W.	06	6250-NP	ST. GEORGE CITY	28.58
T.42S.	R.15W.	06	6251	ST. GEORGE CITY	41.67
T.42S.	R.15W.	06	6252	ST. GEORGE CITY	15.04
T.42S.	R.15W.	06	6252	ST. GEORGE CITY	4.49
T.42S.	R.15W.	06	BLM	BUREAU OF LAND MANAGEMENT	366.27
T.42S.	R.15W.	06	ROW	HIGHWAY/ROAD ROW	1.49
T.42S.	R.15W.	06	ROW	HIGHWAY/ROAD ROW	3.96
T.42S.	R.15W.	06	ROW	HIGHWAY/ROAD ROW	4.70
T.42S.	R.15W.	07	6400-NP	UTAH STATE	328.99
T.42S.	R.15W.	07	BLM	BUREAU OF LAND MANAGEMENT	343.31
T.42S.	R.15W.	08	6600-NP-1	TERRA TITLE CO. TR	49.38
T.42S.	R.15W.	08	6600-NP-1	TERRA TITLE CO. TR	580.15
T.42S.	R.15W.	08	6600-NP-2	ST. GEORGE CITY	1.02
T.42S.	R.15W.	08	6600-NP-2	ST. GEORGE CITY	1.40
T.42S.	R.15W.	08	6600-NP-3	PACIFIC CORP.	2.07
T.42S.	R.15W.	08	ROW	HIGHWAY/ROAD ROW	0.57
T.42S.	R.15W.	08	ROW	HIGHWAY/ROAD ROW	6.41
T.42S.	R.15W.	08	ROW	HIGHWAY/ROAD ROW	2.14
T.42S.	R.15W.	09	6810-D	TERRA TITLE CO. TR	565.98
T.42S.	R.15W.	11	6213-TR	STATE OF UTAH	0.08
T.42S.	R.15W.	11	6213-TR	STATE OF UTAH	1.45
T.42S.	R.15W.	12	STATE	STATE OF UTAH	126.07
T.42S.	R.15W.	16	6225-A	ST. GEORGE CITY	0.38
T.42S.	R.15W.	16	6225-TR	TERRA TITLE CO. TRUSTEE	388.93
T.42S.	R.15W.	17	ROW	HIGHWAY/ROAD ROW	1.79
T.42S.	R.15W.	17	ROW	HIGHWAY/ROAD ROW	2.41
T.42S.	R.15W.	17	ROW	HIGHWAY/ROAD ROW	6.57
T.42S.	R.15W.	17	SG-5-2-17-2000	CITY OF ST. GEORGE	6.10
T.42S.	R.15W.	17	SG-5-2-17-2000	CITY OF ST. GEORGE	113.69
T.42S.	R.15W.	17	SG-5-2-17-2001	TERRA TITLE CO. TRUSTEE	211.81
T.42S.	R.15W.	17	SG-5-2-17-2001	TERRA TITLE CO. TRUSTEE	6.91
T.42S.	R.15W.	17	SG-5-2-17-2002	UAMPS	5.48
T.42S.	R.15W.	17	SG-5-2-17-230	THE NATURE CONSERVANCY	30.47
T.42S.	R.15W.	17	SG-5-2-17-230	THE NATURE CONSERVANCY	50.04
T.42S.	R.15W.	17	SG-5-2-17-300	THE NATURE CONSERVANCY	133.10
T.42S.	R.15W.	17	STATE	STATE OF UTAH	81.68

Table 3.4. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.15W.	29	6208	TOM/DORA, NORM&EILEEN, BLAKE	351.90
T.41S.	R.15W.	29	6209-A	TOM/DORA, NORM&EILEEN, BLAKE	59.99
T.41S.	R.15W.	29	6210-A-NP	TOM/DORA, NORM&EILEEN, BLAKE	83.67
T.41S.	R.15W.	29	6210-B-NP	NORMAN L. BLAKE	10.14
T.41S.	R.15W.	29	6210-B-NP	NORMAN L. BLAKE	7.75
T.41S.	R.15W.	29	BLM	BUREAU OF LAND MANAGEMENT	39.21
T.41S.	R.15W.	30	6211	THOMAS & DORA BLAKE	0.07
T.41S.	R.15W.	30	6211	THOMAS & DORA BLAKE	160.42
T.41S.	R.15W.	30	BLM	BUREAU OF LAND MANAGEMENT	158.71
T.41S.	R.15W.	30	BLM	BUREAU OF LAND MANAGEMENT	336.93
T.41S.	R.15W.	30	ROW	HIGHWAY/ROAD ROW	11.26
T.41S.	R.15W.	30	ROW	HIGHWAY/ROAD ROW	0.46
T.41S.	R.15W.	31	BLM	BUREAU OF LAND MANAGEMENT	665.43
T.41S.	R.15W.	32	6211-NP	DE-MAR LTD.	39.83
T.41S.	R.15W.	32	6212-C	SHAMROCK FINANCIAL SERVICES CO	12.47
T.41S.	R.15W.	32	6212-C	SHAMROCK FINANCIAL SERVICES CO.	25.61
T.41S.	R.15W.	32	6212-D	BUREAU OF LAND MANAGEMENT	0.99
T.41S.	R.15W.	32	6212-NP	DE-MAR LTD.	6.37
T.41S.	R.15W.	32	6212-NP	DE-MAR LTD.	79.80
T.41S.	R.15W.	32	6212-NP	DE-MAR LTD.	109.77
T.41S.	R.15W.	32	BLM	BUREAU OF LAND MANAGEMENT	16.17
T.41S.	R.15W.	32	BLM	BUREAU OF LAND MANAGEMENT	21.38
T.41S.	R.15W.	32	BLM	BUREAU OF LAND MANAGEMENT	318.74
T.41S.	R.15W.	32	ROW	HIGHWAY/ROAD ROW	2.54
T.41S.	R.15W.	32	ROW	HIGHWAY/ROAD ROW	2.13
T.41S.	R.15W.	32	ROW	HIGHWAY/ROAD ROW	2.33
T.41S.	R.15W.	33	BLM	BUREAU OF LAND MANAGEMENT	636.96
T.41S.	R.15W.	34	BLM	BUREAU OF LAND MANAGEMENT	153.68
T.41S.	R.15W.	34	STATE	STATE OF UTAH	483.15
T.41S.	R.15W.	35	STATE	STATE OF UTAH	646.00
T.41S.	R.15W.	36	STATE	STATE OF UTAH	643.61
T.41S.	R.16W.	10	BLM	BUREAU OF LAND MANAGEMENT	33.69
T.41S.	R.16W.	11	BLM	BUREAU OF LAND MANAGEMENT	462.71
T.41S.	R.16W.	12	BLM	BUREAU OF LAND MANAGEMENT	658.49
T.41S.	R.16W.	13	BLM	BUREAU OF LAND MANAGEMENT	703.68
T.41S.	R.16W.	14	BLM	BUREAU OF LAND MANAGEMENT	364.78
T.41S.	R.16W.	14	SNOW	SNOW CANYON STATE PARK	52.55
T.41S.	R.16W.	15	BLM	BUREAU OF LAND MANAGEMENT	77.71
T.41S.	R.16W.	24	BLM	BUREAU OF LAND MANAGEMENT	477.32
T.41S.	R.16W.	25	7266-A	DEMAR LTD.	2.23
T.41S.	R.16W.	25	BLM	BUREAU OF LAND MANAGEMENT	473.21
T.41S.	R.16W.	35	7284	JEL DEVELOPMENT LTD.	6.04
T.41S.	R.16W.	36	STATE	STATE OF UTAH	629.66
T.42S.	R.14W.	05	STATE	STATE OF UTAH	82.33
T.42S.	R.14W.	06	STATE	STATE OF UTAH	380.01
T.42S.	R.14W.	06	W-4-2-6-321	SULLIVAN FAMILY PRTNRSHP	5.54
T.42S.	R.15W.	01	STATE	STATE OF UTAH	606.62

Table 3.4. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	18	6226-NP	ST. GEORGE CITY	90.87
T.42S.	R.15W.	18	6229-NP	ST. GEORGE CITY	171.79
T.42S.	R.15W.	18	6230-NP	STATE OF UTAH	413.13
T.42S.	R.15W.	19	6226-NP	ST. GEORGE CITY	41.07
T.42S.	R.15W.	19	6229-NP	ST. GEORGE CITY	248.82
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	1.85
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	22.67
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	5.67
T.42S.	R.15W.	19	ROW	HIGHWAY/ROAD ROW	2.94
T.42S.	R.15W.	19	SG-1344	CITY OF ST. GEORGE	2.19
T.42S.	R.15W.	19	SG-1660-A	ST. GEORGE CITY	3.30
T.42S.	R.15W.	19	SG-1734-A-1-B-1	CITY OF ST. GEORGE	2.56
T.42S.	R.15W.	19	SG-1743-A	TANA & WARREN COX	4.23
T.42S.	R.15W.	19	SG-1743-A	TANA & WARREN COX	22.29
T.42S.	R.15W.	19	SG-1743-B	DALE & FERN GIBSON	3.97
T.42S.	R.15W.	19	SG-1744-A	CITY OF ST. GEORGE	0.16
T.42S.	R.15W.	19	SG-1744-B	JOHN LAMB	0.17
T.42S.	R.15W.	19	SG-1744-C	CITY OF ST. GEORGE	0.16
T.42S.	R.15W.	19	SG-1763	CITY OF ST. GEORGE	1.48
T.42S.	R.15W.	19	SG-5-2-19-21	ST. GEORGE CITY	83.96
T.42S.	R.15W.	20	6229-NP	ST. GEORGE CITY	82.66
T.42S.	R.15W.	20	BLM	BUREAU OF LAND MANAGEMENT	40.59
T.42S.	R.16W.	01	BLM	BUREAU OF LAND MANAGEMENT	607.26
T.42S.	R.16W.	02	ROW	HIGHWAY/ROAD ROW	4.79
T.42S.	R.16W.	02	SG-6-2-2-110	STATE OF UTAH	121.47
T.42S.	R.16W.	11	ROW	HIGHWAY/ROAD ROW	2.75
T.42S.	R.16W.	11	ROW	HIGHWAY/ROAD ROW	4.12
T.42S.	R.16W.	11	SG-6-2-11-110	AMSCO WINDOWS	22.22
T.42S.	R.16W.	11	STATE	STATE OF UTAH	1.08
T.42S.	R.16W.	12	BLM	BUREAU OF LAND MANAGEMENT	559.92
T.42S.	R.16W.	12	ROW	HIGHWAY/ROAD ROW	7.10
T.42S.	R.16W.	12	STATE	STATE OF UTAH	63.43
T.42S.	R.16W.	12	STATE	STATE OF UTAH	0.10
T.42S.	R.16W.	13	MUNICIPAL	MUNICIPAL	15.35
T.42S.	R.16W.	13	ROW	HIGHWAY/ROAD ROW	9.12
T.42S.	R.16W.	13	SG-6-2-13-1100	CITY OF ST. GEORGE	162.69
T.42S.	R.16W.	13	SG-6-2-13-1100	CITY OF ST. GEORGE	81.79
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	28.03
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	111.72
T.42S.	R.16W.	13	STATE	STATE OF UTAH	3.84
T.42S.	R.16W.	13	STATE	STATE OF UTAH	17.06
T.42S.	R.16W.	24	SG-1752-A	SANDSTONE TERRACE	7.91
T.42S.	R.16W.	24	SG-6-2-13-3100	CITY OF ST. GEORGE	48.07

- Water development should be allowed consistent with the HCP protocol.[3]
- Firefighting should be allowed.
- Research which will not negatively influence the desert tortoise should be allowed.
- Non-consumptive recreation (e.g., hiking, birdwatching) should be allowed.
- Maintenance of existing utilities including roads should be allowed.
- Desert tortoise translocation should not be permitted except as authorized under approved translocation projects.
- The eventual reconstruction of Skyline Drive should follow the existing alignment as near as possible except where engineering and/or safety considerations require deviations. Biological review under this HCP will be necessary when deviating from the current alignment. From Skyline Drive, no general public access will be permitted into the reserve, except on designated trails. However, access to Skyline Drive will be available for private landowners until their property is acquired.

3.3.4 Zone 4: Babylon

3.3.4.1 Description

Zone 4 covers the area known as Babylon, bounded on the west by Interstate 15 and Quail Creek Reservoir, on the south by the Virgin River, and on the north and east by approximate limits of desert tortoise habitat. Table 3.5 presents land ownership information, and Figure 3.5 presents boundaries and general land ownership. This area includes 5,191 acres of BLM land and 6 acres of private land.

3.3.4.2 Management

Management of Zone 4 would be similar to the other zones of the reserve. Zone 4 will be evaluated as a possible translocation site. If it is determined that Zone 4 is a suitable translocation site then it would be managed accordingly. The following management regulations are recommended for Zone 4:

- Hiking, equestrian use, and camping should be allowed.

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[3] The HCP is aware that the City of St. George is considering permanently storing water behind City Creek Dam and constructing a pipeline from the dam to deliver the water. Should this proposal be formally submitted, it will be reviewed according to the protocols contained in this HCP as further explained in the Appendix.

- Grazing. hunting and mining should be allowed.
- Landowner activities associated with the private residence in the vicinity of "Babylon" should be permitted. However, ground disturbance in the reserve will require clearance prior to occurrence.
- Utility and road corridor maintenance should be allowed.
- New utility easements should be allowed and follow the HCP protocol.
- Vehicles should be restricted to designated roads.
- Firefighting should be allowed.
- Research including non-intrusive monitoring of desert tortoise population dynamics, should be allowed.
- Non-consumptive recreation (e.g., hiking, birdwatching, photography, casual horseback riding) should be allowed.
- Desert tortoise translocation would not be permitted except as authorized under approved translocation projects.

Table 3.5. Parcel Information for Zone 4 of the Proposed Reserve.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	17	BLM	BUREAU OF LAND MANAGEMENT	569.29
T.41S.	R.13W.	18	BLM	BUREAU OF LAND MANAGEMENT	660.46
T.41S.	R.13W.	19	BLM	BUREAU OF LAND MANAGEMENT	601.99
T.41S.	R.13W.	20	BLM	BUREAU OF LAND MANAGEMENT	636.62
T.41S.	R.13W.	21	BLM	BUREAU OF LAND MANAGEMENT	610.28
T.41S.	R.13W.	22	BLM	BUREAU OF LAND MANAGEMENT	173.18
T.41S.	R.13W.	27	BLM	BUREAU OF LAND MANAGEMENT	24.99
T.41S.	R.13W.	28	3305-B	AR SPILSBURY F.E.	3.26
T.41S.	R.13W.	28	3305-B	AR SPILSBURY F.E.	2.80
T.41S.	R.13W.	28	3305-TR	UNITED STATES OF AMERICA	39.36
T.41S.	R.13W.	28	3305-TR	UNITED STATES OF AMERICA	16.66
T.41S.	R.13W.	29	BLM	BUREAU OF LAND MANAGEMENT	257.74
T.41S.	R.13W.	30	BLM	BUREAU OF LAND MANAGEMENT	260.33
T.41S.	R.14W.	13	BLM	BUREAU OF LAND MANAGEMENT	38.49
T.41S.	R.14W.	13	BLM	BUREAU OF LAND MANAGEMENT	220.48
T.41S.	R.14W.	24	BLM	BUREAU OF LAND MANAGEMENT	639.62
T.41S.	R.14W.	25	BLM	BUREAU OF LAND MANAGEMENT	440.75

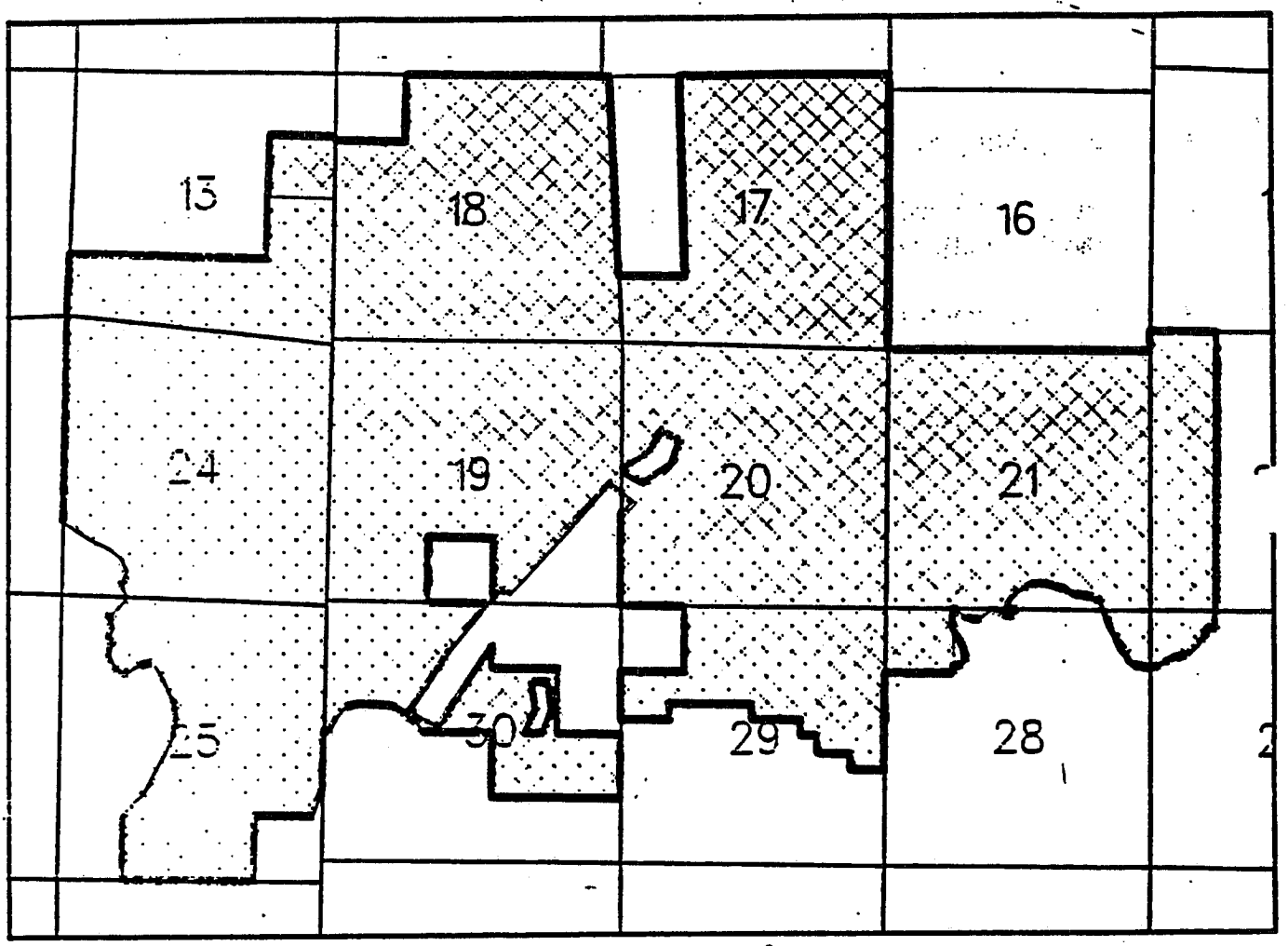

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Figure 3.5. Zone 4: Babylon

3.3.5 Zone 5: Hurricane

3.3.5.1 Description

Zone 5 covers the area bounded on the north by the Virgin River and on the south by the City of Hurricane, including the two cinder knolls. Table 3.6 presents land ownership information for Zone 5, and Figure 3.6 presents boundaries and general land ownership. This area is approximately 766 acres in size, of which 130 are managed by the BLM.

The reserve boundary in the vicinity of the Hurricane Cinder Knolls has been arrived at through a cooperative agreement with the landowner. The boundary in this area closely corresponds to the creosote bush community, which in turn is usually representative of moderate to dense desert tortoise populations. In some instances, because of landowner constraints, this habitat could not be included within the boundary. However, in such situations, the landowner has agreed to a "Kayenta" style of house development that leaves approximately 75 percent of the impacted habitat in an unaltered state. Additionally, fencing will be done to help deter pets. Exactly where this will be done will be finalized upon completion of the landowner's development plans. This kind of pragmatic development is thought to be highly conducive to maintaining desert tortoise populations. Additionally, it leaves desirable habitat between the two Cinder Knolls to facilitate gene flow.

Hurricane City has expressed the need to turn Route 600 north, at the southern boundary of the Reserve, into a major road through the city. This expansion is of significant concern as it could include the development of homes and commercial areas in an area previously identified as part of the Reserve. The County has discussed the matter with Hurricane and is currently exploring alternatives that would keep the Reserve at its present size and not biologically impair tortoises or other species in this area. Any proposals for this expansion would be put to the HCAC, County commissioners, and the USFWS through established amendment protocols.

3.3.5.2 Management

Zone 5 will be managed as a desert tortoise reserve by the BLM. The following management regulations are recommended for Zone 5:

- Hiking and equestrian use should be restricted to designated trails.
- Utility and road corridor maintenance should be allowed and follow the HCP protocol.
- New utility easements should be allowed and follow the HCP protocol.
- Vehicles should be restricted to designated roads.
- Firefighting should be allowed.

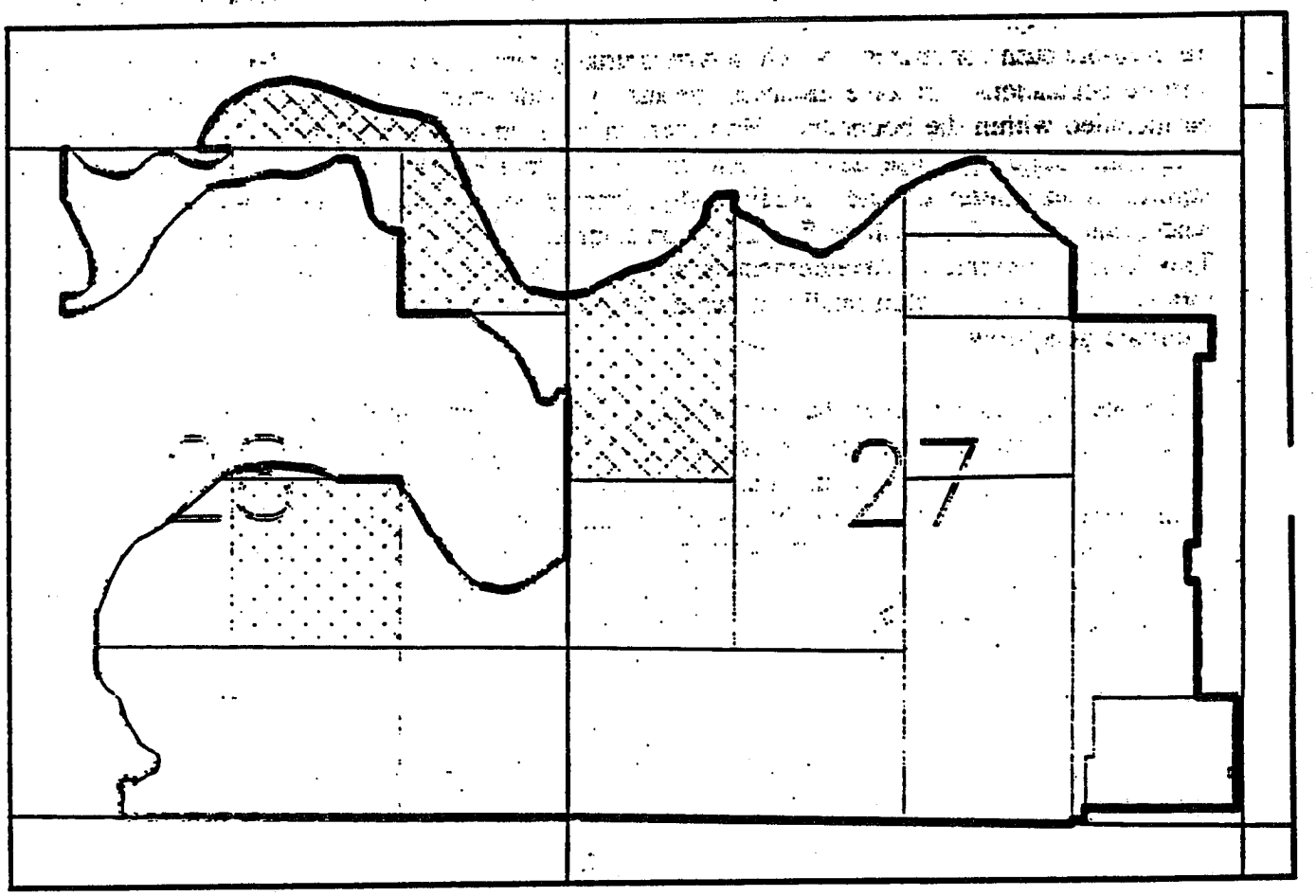

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Figure 3.6. Zone 5: Hurricane

- Research, including non-intrusive monitoring of desert tortoise population dynamics should be allowed.
- Non-consumptive recreation should be allowed.
- Desert tortoise translocation would not be permitted except as authorized under approved translocation projects.
- No grazing will be allowed in desert tortoise habitat.

Table 3.6. Parcel Information for Zone 5 of the Proposed Reserve.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	21	BLM	BUREAU OF LAND MANAGEMENT	16.67
T.41S.	R.13W.	27	BLM	BUREAU OF LAND MANAGEMENT	52.92
T.41S.	R.13W.	27	H-3-1-27-1200	GRANT & MARGARET BEATTY	68.00
T.41S.	R.13W.	27	H-3-1-27-1400	KENNETH ANDERSON	10.79
T.41S.	R.13W.	27	H-3-1-27-1402	KENNETH ANDERSON	19.35
T.41S.	R.13W.	27	H-3-1-27-2201	CITY OF HURRICANE	22.24
T.41S.	R.13W.	27	H-3-1-27-2203	MOUNTAIN FUEL SUPPLY COMPANY	0.05
T.41S.	R.13W.	27	H-3-1-27-2401	CITY OF HURRICANE	79.88
T.41S.	R.13W.	27	H-3-1-27-310-SA	MTN. STATES TELEGRAPH & TELEPHONE	0.22
T.41S.	R.13W.	27	H-3-1-27-3201	CALVIN & MONA LOWE TRUSTEES	79.31
T.41S.	R.13W.	27	H-3-1-27-3401	CALVIN & MONA LOWE TRUSTEES	39.13
T.41S.	R.13W.	27	H-3-1-27-4201	CALVIN & MONA LOWE TRUSTEES	37.24
T.41S.	R.13W.	27	H-3-1-27-4201	CALVIN & MONA LOWE TRUSTEES	98.25
T.41S.	R.13W.	28	3305-TR	UNITED STATES OF AMERICA	22.09
T.41S.	R.13W.	28	BLM	BUREAU OF LAND MANAGEMENT	39.17
T.41S.	R.13W.	28	H-3-1-28-1201	AR SPILSBURY F.E.	6.66
T.41S.	R.13W.	28	H-3-1-28-1301	AR SPILSBURY F.E.	1.51
T.41S.	R.13W.	28	H-3-1-28-1401	AR SPILSBURY F.E.	7.93
T.41S.	R.13W.	28	H-3-1-28-2101	AR SPILSBURY F.E.	20.27
T.41S.	R.13W.	28	H-3-1-28-2201	AR SPILSBURY F.E.	40.06
T.41S.	R.13W.	28	H-3-1-28-2301	AR SPILSBURY F.E.	39.61
T.41S.	R.13W.	28	H-3-1-28-3101	AR SPILSBURY F.E.	22.22
T.41S.	R.13W.	28	H-3-1-28-3201	AR SPILSBURY F.E.	25.27
T.41S.	R.13W.	28	H-3-1-28-4101	AR SPILSBURY F.E.	18.63
T.41S.	R.13W.	28	H-3-1-28-4201	AR SPILSBURY F.E.	0.06

3.4 WATER DEVELOPMENT, FLOOD CONTROL, AND OTHER UTILITY CORRIDOR DEVELOPMENT AND MAINTENANCE

Of critical importance to the residents of Washington County is the ability to maintain existing utility corridors and facilities within the proposed reserve as well as having the option to construct new utility corridors and flood control projects consistent with reserve management guidelines. This section outlines some of the anticipated future projects as well as protocols for their implementation (see also Appendix A). Figure 3.7 represents a sampling of current and future utility corridors within and adjacent to the proposed reserve. All existing utility corridors are approved and recognized as existing uses, whether or not they are shown on Figure 3.7.

3.4.1 Water Development

The importance of water development to the residents and local governments in Washington County cannot be overemphasized. Much of the water development potential exists in the aquifers beneath desert tortoise habitat on State School Trust lands. There is serious concern that the ability of the cities to pursue water development may be seriously curtailed should this HCP be implemented. Of particular concern is how the Section 10(a)(1)(B) permit is treated once State School Trust lands are exchanged to the BLM. To alleviate this concern, the Steering Committee has developed a protocol for water development in non-take areas and within the HCP reserve. This protocol (contained in Appendix A) is designed to comply with the Act for water development and maintenance of water facilities on BLM and non-Federal lands, and was developed primarily to avoid take of desert tortoise. This protocol will apply to future Section 7 consultations for utility projects in the Upper Virgin River Recovery Unit.

3.4.2 Flood Control

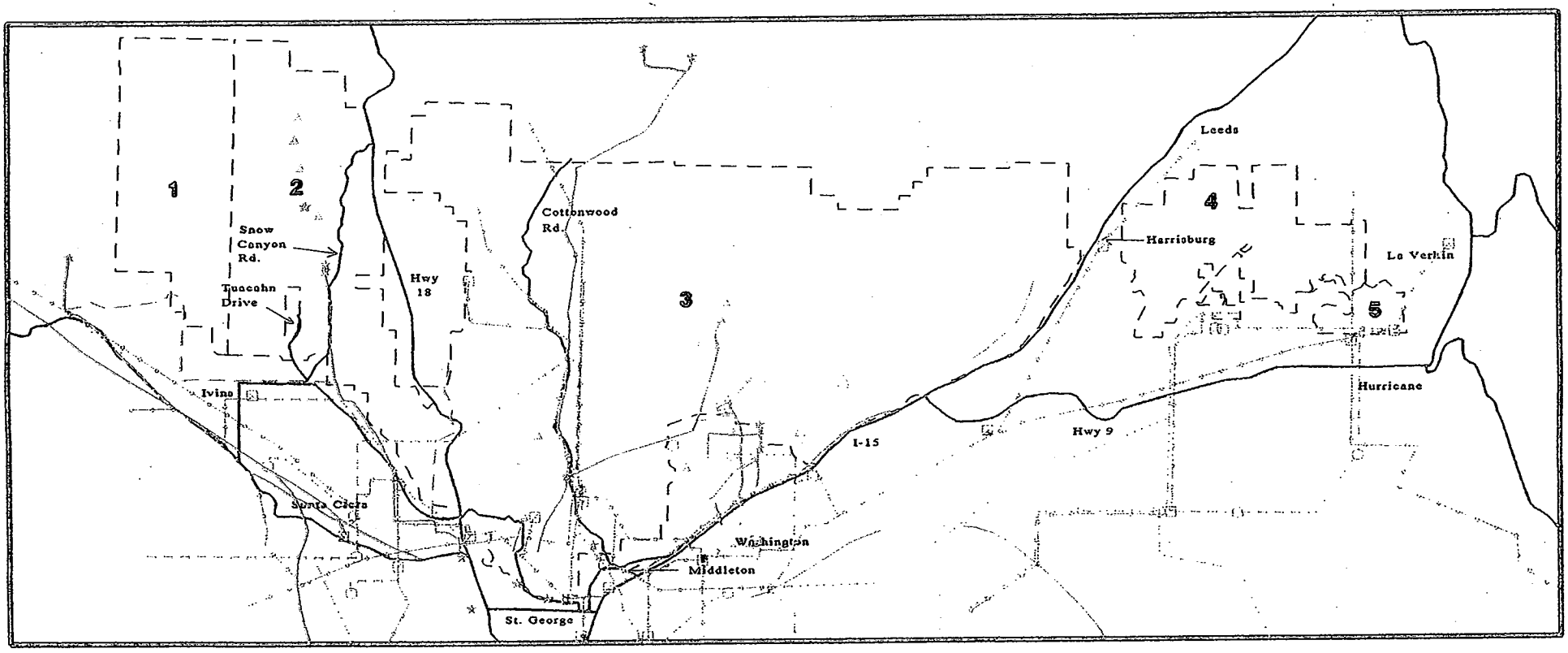
This HCP recognizes the need for flood control and other water retention structures in the reserve. Where these structures require other Federal permits, separate Section 7 consultation will be required. The Washington County Water Conservancy District has identified the need for flood control structures on Cottonwood and Quail Creeks, and a de-silting pond near the Virgin River, within the reserve. The HCAC will review said proposals.

3.4.3 Other Utility Corridor Construction and Maintenance

Numerous utility corridors exist throughout the proposed reserve. While some of these are new, others are much older and will require replacement and upgrading in the future. Two utility protocols are contained in Appendix A: one for water exploration, construction, operation, and maintenance and another for electric distribution line construction and maintenance. These protocols will be followed for utility corridor work within the proposed reserve.

3.5 ROAD PROTOCOL

Within the proposed reserve are five paved roadways: Snow Canyon, Tuacahn, Highway 18, Cottonwood, and Skyline Drive. Tuacahn and Skyline are currently fenced. Highway 18 will be fenced on both sides, enclosing a right-of-way between 200 and 300 feet. The following activities will be permitted within the fenced Highway 18 right-of-way: road maintenance, reconstruction, and widening; utility maintenance and installation; and bicycle paths construction and maintenance. Agreed upon protocols will have to be followed to minimize potential impacts to the Mojave desert tortoise. Existing tortoise fencing along Skyline Drive will be upgraded within the reserve boundaries, with the same right-of-way restrictions that apply to Highway 18. Snow Canyon, Cottonwood, and unpaved roads in Ivins and Babylon within the reserve have not been identified for fencing. However, improvements or maintenance to these roads should also follow the HCP protocol.



Existing Water Line
Proposed Water Line
Existing Power Line
Proposed Power Line
DWMA Boundary
Roads

Existing Well
Tested Well Site
Existing Tank
Proposed Tank Site
Existing Substation
Proposed Substation

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N

3000 0 3000 6000 meters

Figure 3.7. Current and Future Utility Corridors

CHAPTER 4.0
NON-RESERVE

4.1 INTRODUCTION

Lands in Washington County outside the proposed reserve boundaries (non-reserve lands) are shown in Figure 4.1. These properties are currently managed by the BLM, Dixie National Forest, Zion National Park, Utah Division of State Lands and Forestry, and private and municipal interests. All non-reserve State and private lands are included in this request for a Section 10(a)(1)(B) Incidental Take Permit—with the exception of Beaver Dam Slope in the northeastern Mojave Recovery Unit—and fall into one of three categories: identified desert tortoise habitat (take areas), potential desert tortoise habitat, and non-habitat.

Non-reserve, *identified desert tortoise habitat* consists of areas within the known range of the Mojave desert tortoise in Washington County where tortoises or other evidence of tortoise occupation have been found. Take is likely to occur in these areas. This Chapter describes the location of such lands and identifies the landowners and assessor number of each parcel (see footnote 1 on page 23).

Non-reserve, *potential desert tortoise habitat* consists of areas that theoretically could support desert tortoises but have shown no evidence of tortoise occupation. This habitat will not count against incremental take acreage; however, if tortoises should be discovered and removed from these areas because of proposed development or other changes in land use, the removed animals would count against the incidental take total of the permit.

Non-reserve, *non-habitat* areas are lands unlikely to support desert tortoises. While the probability of finding endemic tortoises in non-habitat areas is very low, these areas are included under the incidental take permit because the County recognizes that a desert tortoise may be found anywhere. This possibility exists because of the historical use of the desert tortoise as pets and the ease of transporting the animal. The take permit is therefore necessary in all non-reserve areas to resolve the potential for conflict.

Accordingly, the permit provides for incidental take of Mojave desert tortoise on an estimated 350,000 acres of private and state school trust lands in Washington County, Utah. These 350,000 acres consist of all the private and state school trust lands in the County outside of the proposed reserve and outside areas of the Beaver Dam Slope designated as Mojave desert tortoise habitat in Figure 1.1. Part of these 350,000 acres (precisely 12,264) will be managed by a release program as described in this HCP. The remaining acres (approximately 338,000) will be automatically released as incidental take upon issuance of the permit, provided, however, that any tortoise taken from that acreage will apply against the 1,169 tortoise incidental take allowance.

The HCP administrator may amend the HCP to change the boundaries of the non-reserve habitat areas (take areas) to either include newly designated acreage or remove previously designated acreage. This means that designated take areas will be managed dynamically in the best interest

of desert tortoise safety by minimizing the chances of accidental death resulting from development. For example, if a desert tortoise population previously thought to reside over 500 acres is found to actually reside over 700 acres, biological surveys and translocation would be required across the entire 700 acres, and the boundaries of the designated take area so modified. This would ensure that desert tortoises in the "additional 200 acres" are translocated and "saved." By contrast, an area previously thought to contain desert tortoises, but later found not to, would be eliminated from the habitat category; the boundaries would be adjusted; and the acres in question would not be counted as take.

4.2 FEDERAL NON-RESERVE HABITAT AREAS

As depicted in Figure 4.1 and in Table 4.1, there are 4,681 acres of Federal lands (BLM, National Park, National Forest) and Indian Tribal lands that are known desert tortoise habitat but are not included within the proposed reserve boundaries. As these are Federal and Indian lands, they can not be identified for incidental take under a Section 10(a)(1)(B) permit, and therefore are only identified as non-reserve for purposes of this HCP. Any actions that these agencies may undertake for these lands that may affect the Mojave desert tortoise or other Federally listed species will be subject to the Section 7 consultation process.

Table 4.1. Amount of Desert Tortoise Habitat in Federal Non-Reserve Areas.

	Desert Tortoise Density Classification			
Ownership	Low	Medium	High	Total
BLM	1,931	63	32	2,026
USFS	83	0	0	83
NPS	2	0	0	2
BIA	2,521	2	47	2,570
State*	114	0	98	212
Total	4,651	65	177	4,893

* These State lands are part of the Paiute Indian Tribal Lands.

4.3 INCIDENTAL TAKE AREAS

The incidental take permit is a county-wide take permit for desert tortoises, so take may occur anywhere in the County outside the reserve (excluding the Beaver Dam Slope) where a city has passed the HCP Impact Fees Ordinance. The HCP process has identified areas where incidental take is most likely to occur, totaling 12,264 acres. Defining take areas has been the result of balancing the conflicting needs of habitat preservation with growth and development in Washington County, without significantly impacting the desert tortoise population. Take areas are primarily low-density habitat adjacent to existing development. Most of these areas are within the boundaries of the incorporated cities of Washington County and have already been adversely impacted by urban development and human activities. Specifically, habitat in the areas proposed for take has been impacted by dumping, OHV use, vandalism, vehicle traffic, and

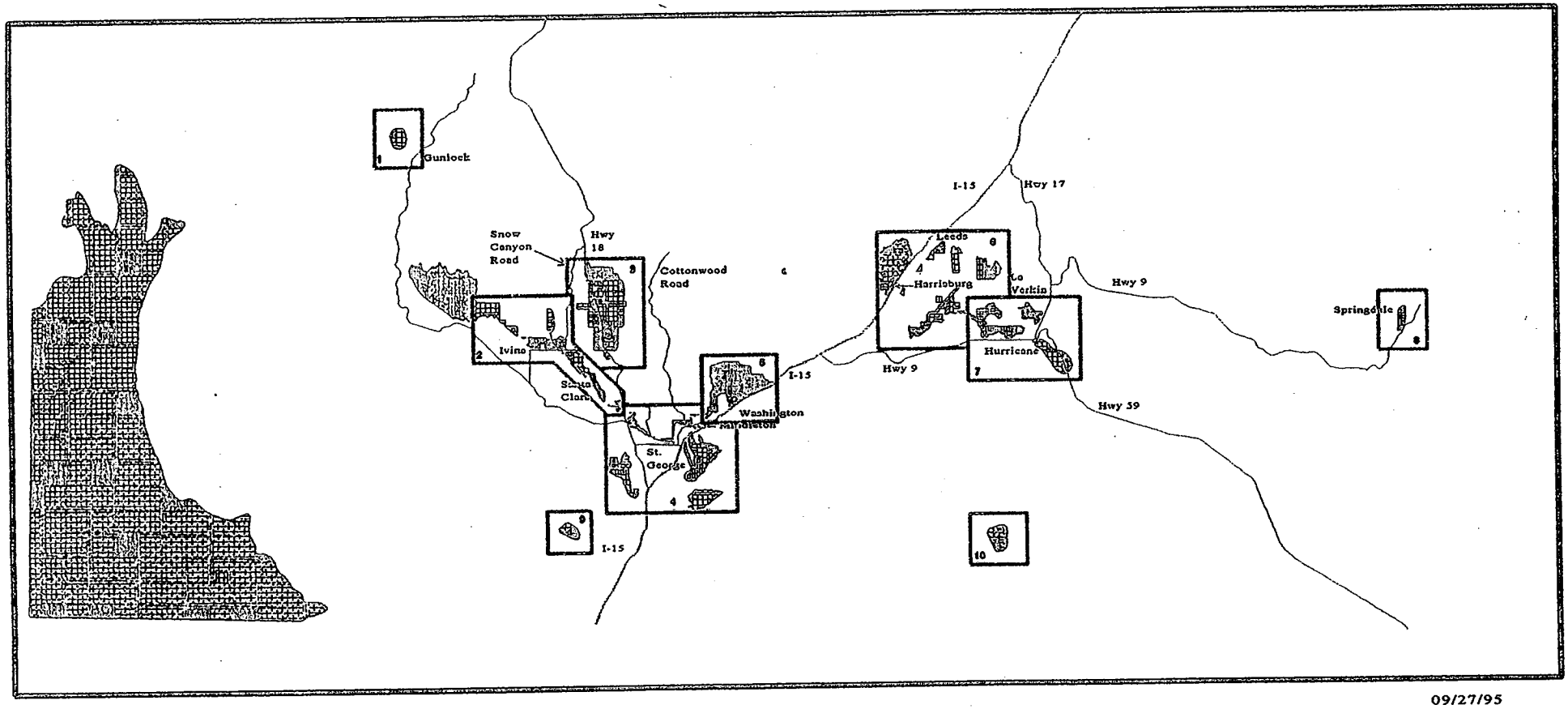

Figure 4.1. Proposed Non-Reserve Areas

grazing. Take areas of medium or high density have only been included where necessary to accommodate specific concerns or issues associated with private property. A summary of the acreage identified for incidental take is presented in Table 4.2.

Table 4.2. Amount of Desert Tortoise Habitat in Incidental Take Areas

Area Zone/Name	State Lands*			Private Lands*			
	Low	Med	High	Low	Med	High	Total
1/Gunlock	0	0	0	196	0	0	196
2/Ivins/Padre/Paradise	17	0	85	1,073	0	356	1,531
3/Winchester Hills	656	0	10	2,181	0	245	3,092
4/St. George	0	0	0	1,852	62	223	2,137
5/North Washington	554	597	42	204	295	313	2,005
6/Harrisburg/Leeds/ Babylon	307	0	0	1,226	7	0	1,540
7/Hurricane	54	0	0	703	316	338	1,411
8/Springdale	0	0	0	159	0	0	159
9 Bloomington Hill	67	39	0	0	0	0	106
10/South Hurricane Cliffs	87	0	0	0	0	0	87
Total	1,742	636	137	7,594	680	1,475	12,264

* Private includes lands owned by Washington County, municipalities, highway right-of-way, as well as private owners. State includes only State School Trust lands.

4.3.1 Gunlock Take Area

The Gunlock area is located approximately one mile north of Gunlock Reservoir and contains approximately 196 acres of low-density desert tortoise habitat on private land. Land ownership and a general legal description are presented in Table 4.3 and graphically depicted in Figure 4.2. While this desert tortoise population is isolated, small, and difficult to manage, and development has not been slated for this area, inclusion as a take area allows the owners to pursue development options.

Table 4.3. Parcel Information for Gunlock Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.40S.	R.17W.	20	8206-NP	HYRUM W. & A. GAIL SMITH	195.70

4.3.2 Ivins/Padre Canyon/Paradise Canyon Take Area

The Ivins/Padre Canyon/Paradise Canyon area is east of the Paiute Indian Tribal Lands, west of Highway 18, north of the proposed extension of Skyline Drive, and south of Snow Canyon State Park and the proposed BLM Wilderness Area on top of Red Mountain. This area is graphically depicted in Figure 4.3, and land ownership and legal descriptions are provided in Table 4.4.

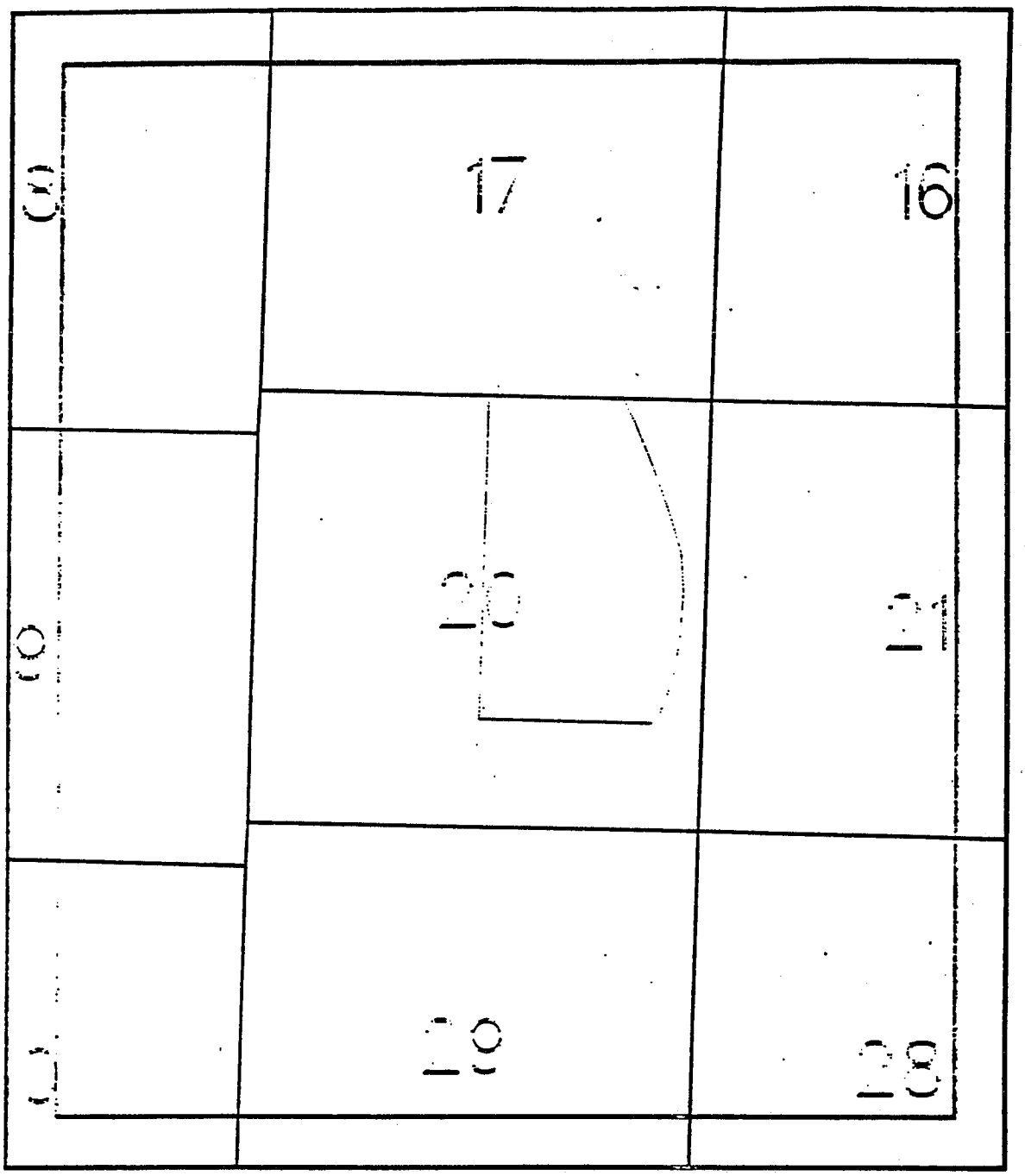

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Figure 4.2. Gunlock Take Area

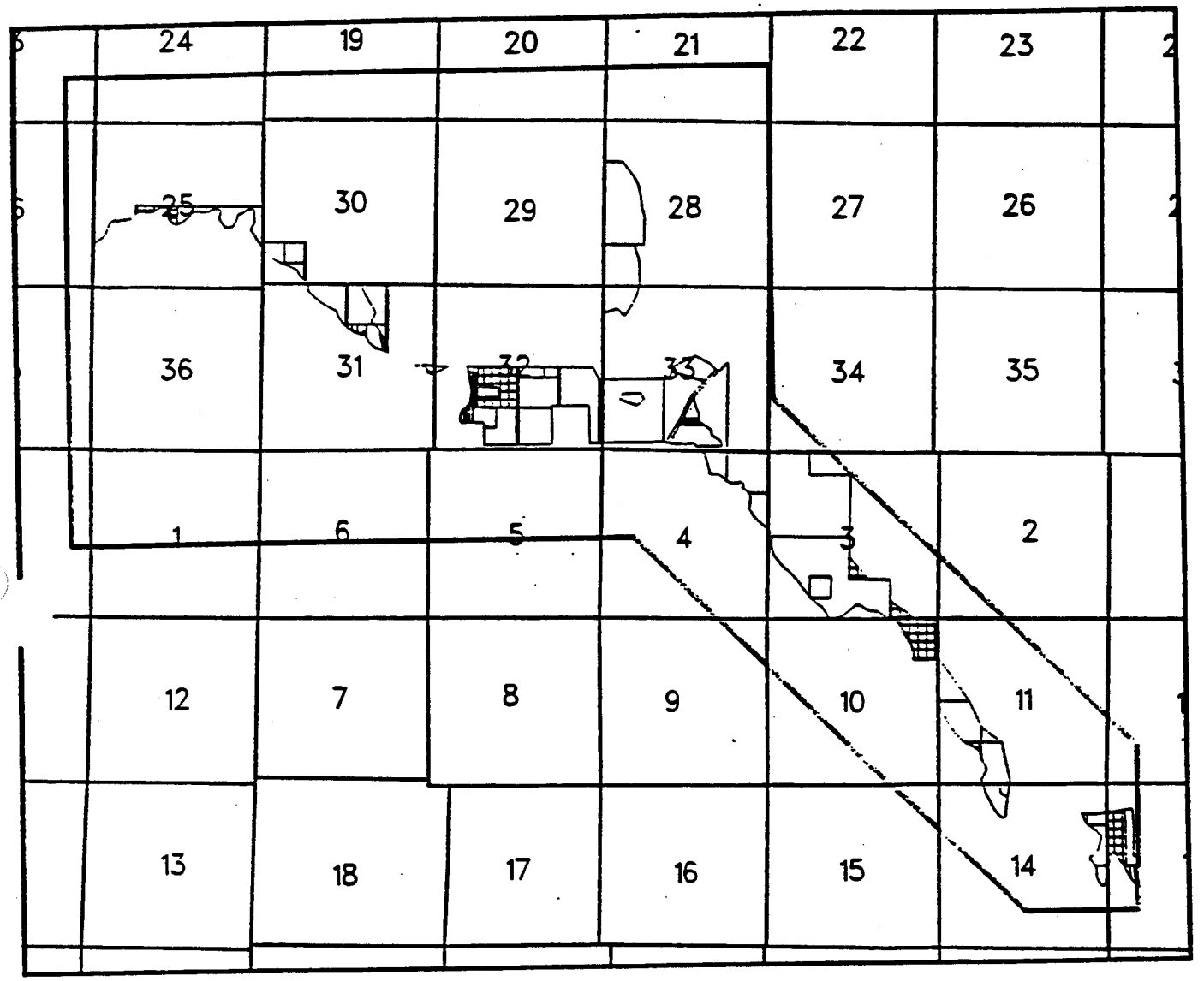


Figure 4.3. Ivins/Padre Canyon/Paradise Canyon Take Area

Table 4.4. Parcel Information for Ivins/Padre Canyon/Paradise Canyon Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	28	I-6-1-28-3000	HYRUM SMITH	36.10
T.41S.	R.16W.	28	I-6-1-28-34401	HERITAGE ARTS FOUNDATION	71.36
T.41S.	R.16W.	30	I-6-1-30-3310	ELDON AND LINDA LEE MOHLER, TR	9.59
T.41S.	R.16W.	30	I-6-1-30-3321	JEAN CASTLETON	11.10
T.41S.	R.16W.	30	ROW	HIGHWAY/ROAD ROW	1.75
T.41S.	R.16W.	30	ROW	HIGHWAY/ROAD ROW	0.17
T.41S.	R.16W.	31	7277-A	WILLIAMS CARMA & ASSOCIATION INC.	15.90
T.41S.	R.16W.	31	7277-B	R.C. & ARLEEN ANN TOLMAN	20.10
T.41S.	R.16W.	31	I-6-1-31-1330	IRVIN AND KAY ROBERT ENCE	0.07
T.41S.	R.16W.	31	I-6-1-31-1333	VINCENT AND CARMON MESSNER	<0.01
T.41S.	R.16W.	31	I-6-1-31-1334	KAY ENCE, TR	0.56
T.41S.	R.16W.	31	I-6-1-31-1336	JAY AND JEAN RENEE' SMITH	0.92
T.41S.	R.16W.	31	I-6-1-31-1338	CHALLEN KELKER	0.36
T.41S.	R.16W.	31	I-6-1-31-1342	MARCIA FIESTAL	1.96
T.41S.	R.16W.	31	I-6-1-31-32-2000	TOWN OF IVINS	1.42
T.41S.	R.16W.	31	I-6-1-31-32-2000	TOWN OF IVINS	0.02
T.41S.	R.16W.	31	I-6-1-31-41010	IRVIN ENCE, TR	19.51
T.41S.	R.16W.	31	I-6-1-31-4102	PETER CHESNEY & SANDRA HUGHES	0.04
T.41S.	R.16W.	31	ROW	HIGHWAY/ROAD ROW	7.14
T.41S.	R.16W.	31	ROW	HIGHWAY/ROAD ROW	0.24
T.41S.	R.16W.	31	SB-6-B-1	FLOYD ENCE, TR	7.03
T.41S.	R.16W.	31	SB-6-B-1	FLOYD ENCE, TR	0.59
T.41S.	R.16W.	31	SB-6-C-1	TOWN OF IVINS	2.84
T.41S.	R.16W.	32	CIRCLE CLIFF	SUBDIVISION	0.02
T.41S.	R.16W.	32	I-11-F-1	CRAIG FLOWERS	0.15
T.41S.	R.16W.	32	I-11-F-10	RAY E. FLOWERS, TR	0.20
T.41S.	R.16W.	32	I-11-F-12	RICHARD DUFFY	0.18
T.41S.	R.16W.	32	I-11-F-2	RAYBORN S. AND BONNIE STOKES	0.15
T.41S.	R.16W.	32	I-11-F-3-A	HENRIETTA BOSS	0.26
T.41S.	R.16W.	32	I-11-F-5	HENRY AND MEKA BAKER	0.21
T.41S.	R.16W.	32	I-11-F-6	EDWARD NELSON & CAROLE SPENCER	0.21
T.41S.	R.16W.	32	I-11-F-7	RONALD AND GLORIA TUNBRIDGE	0.25
T.41S.	R.16W.	32	I-11-F-8	KEVIN AND NADINE HANCEY	0.20
T.41S.	R.16W.	32	I-11-F-9	SCHOLZEN PRODUCTS CO.	0.17
T.41S.	R.16W.	32	I-65-A-1-A-1-A	WILFORD AND JOANNE HAFEN	0.79
T.41S.	R.16W.	32	I-65-A-1-A-1-C	STEPHEN AND HOPE ESAUK	0.01
T.41S.	R.16W.	32	I-65-A-1-A-1-E	DARREL LEE AND CHARLENE CHILD	0.17
T.41S.	R.16W.	32	I-65-A-1-A-2	TODD AND CLEMENTINA SAHLEEN	0.08
T.41S.	R.16W.	32	I-65-A-1-A-3	KEVIN AND DEANNA LAW	0.04
T.41S.	R.16W.	32	I-65-A-1-B-1	KENT SORENSEN	0.30
T.41S.	R.16W.	32	I-65-A-1-B-2	LARRY WILSON & SHARYN MUSGRAVE	0.29
T.41S.	R.16W.	32	I-65-A-1-B-3	PERRY AND ANDREA COOPER	0.30
T.41S.	R.16W.	32	I-66-A-2-A	RAYMOND AND TRUDY HINDES	0.04
T.41S.	R.16W.	32	I-66-B-1	GARNA STEVENS	0.36
T.41S.	R.16W.	32	I-66-B-2	SAVA MALETICH	0.07
T.41S.	R.16W.	32	I-75-A-1-A-10	RUSSELL PREECE, TR	0.17
T.41S.	R.16W.	32	I-75-A-1-A-11	RUSSEL PREECE, TR	0.18
T.41S.	R.16W.	32	I-75-A-1-A-13	RAYMOND AND DOROTHY SCHICK	0.18

Table 4.4. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	32	I-75-A-1-A-14	MARY FORESTIER	0.17
T.41S.	R.16W.	32	I-75-A-1-A-3	TOWN OF IVINS	0.08
T.41S.	R.16W.	32	I-75-A-1-A-3	TOWN OF IVINS	0.27
T.41S.	R.16W.	32	I-75-A-1-A-4	LOLA FLOWERS	0.15
T.41S.	R.16W.	32	I-75-A-1-A-5	ROVERT AND CHRISTIE BEST	0.21
T.41S.	R.16W.	32	I-75-A-1-A-6	CAREY AND ELAINE BRINKERHOFF	0.20
T.41S.	R.16W.	32	I-75-A-1-A-7	DEBRA ANDERSON	0.14
T.41S.	R.16W.	32	I-75-A-1-A-9	CHARLES & BRENDA STANKOWSKY	0.16
T.41S.	R.16W.	32	I-SB-16-A	ALAN & KAY BLOOD FAMILY PARTNERSHIP	22.63
T.41S.	R.16W.	32	I-SB-16-B	TOWN OF IVINS	9.24
T.41S.	R.16W.	32	I-SB-16-C	STATE OF UTAH	32.86
T.41S.	R.16W.	32	I-SB-16-D-1	CRAIG AND LINDA FLOWERS	5.01
T.41S.	R.16W.	32	I-SB-17	ALAN & KAY BLOOD FAMILY PARTNERSHIP	27.81
T.41S.	R.16W.	32	I-SB-18-A	WESTON HAFEN FAMILY PARTNERSHIP	27.08
T.41S.	R.16W.	32	I-SB-18-B	NORMAN AND MARGARET DRAEGER	3.53
T.41S.	R.16W.	32	I-SB-18-C	ARTHUR AND JENNIFER BENDER	6.31
T.41S.	R.16W.	32	I-SB-19-A	WESTON HAFEN FAMILY PARTNERSHIP	3.10
T.41S.	R.16W.	32	I-SB-19-A	WESTON HAFEN FAMILY PARTNERSHIP	42.75
T.41S.	R.16W.	32	MUNICIPAL	MUNICIPAL	1.13
T.41S.	R.16W.	32	MUNICIPAL	MUNICIPAL	1.34
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	3.04
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	3.57
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	4.09
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	1.91
T.41S.	R.16W.	32	ROW	HIGHWAY/ROAD ROW	0.02
T.41S.	R.16W.	33	I-6-1-33-13001	CARROLL KUNTZ	14.84
T.41S.	R.16W.	33	I-6-1-33-230-A	NATIONAL INSTITUTE OF FITNESS	4.05
T.41S.	R.16W.	33	I-6-1-33-231	MARCUS AND VICKI SORENSON	0.96
T.41S.	R.16W.	33	I-6-1-33-231	MARCUS AND VICKI SORENSON	0.85
T.41S.	R.16W.	33	I-6-1-33-232	NATIONAL INSTITUTE OF FITNESS	1.04
T.41S.	R.16W.	33	I-6-1-33-2400	ALLAN VAN PELT	0.90
T.41S.	R.16W.	33	I-6-1-33-2400	ALLAN VAN PELT	42.82
T.41S.	R.16W.	33	I-6-1-33-2401	ROBERT & BEVERLEE MURRAY	33.37
T.41S.	R.16W.	33	I-6-1-33-2402	NATIONAL INSTITUTE OF FITNESS	17.52
T.41S.	R.16W.	33	I-6-1-33-3300	ROBERT AND BEVERLEE MURRAY, TRS	88.21
T.41S.	R.16W.	33	I-6-1-33-3302	ROBERT AND BEVERLEE MURRAY	4.77
T.41S.	R.16W.	33	I-6-1-33-4000	HYRUM SMITH	19.49
T.41S.	R.16W.	33	ROW	HIGHWAY/ROAD ROW	5.81
T.41S.	R.17W.	25	KAYENTA	TERRY MARTIN	24.68
T.41S.	R.17W.	25	KAYENTA	TERRY MARTIN	343.39
T.41S.	R.17W.	25	STATE	STATE OF UTAH	7.02
T.42S.	R.16W.	03	7288-A	A H GUBLER (HOLDINGS)	141.36
T.42S.	R.16W.	03	SG-6-2-3-30001	MAE LYTLE (TRUST)	120.26
T.42S.	R.16W.	03	SG-6-2-3-3240	MAE LYTLE (TRUST)	10.56
T.42S.	R.16W.	03	STATE	STATE OF UTAH	5.02
T.42S.	R.16W.	03	STATE	STATE OF UTAH	5.19
T.42S.	R.16W.	04	7288-C	THORLEY CATTLE CO.	35.80
T.42S.	R.16W.	04	7288-N	A H GUBLER (HOLDINGS)	11.79

Table 4.4. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.16W.	04	I-6-2-4-1400	BEVERLEE & ROBERT MURRAY TRUST	11.23
T.42S.	R.16W.	10	SG-6-2-10-1400	WASHINGTON COUNTY	0.05
T.42S.	R.16W.	10	STATE	STATE OF UTAH	29.18
T.42S.	R.16W.	11	SG-6-2-11-311	WASHINGTON COUNTY	3.34
T.42S.	R.16W.	11	SG-6-2-11-411	WASHINGTON COUNTY	14.86
T.42S.	R.16W.	11	STATE	STATE OF UTAH	1.77
T.42S.	R.16W.	11	WACO	WASHINGTON COUNTY	22.10
T.42S.	R.16W.	11	WACO	WASHINGTON COUNTY	27.39
T.42S.	R.16W.	13	ROW	HIGHWAY/ROAD ROW	11.43
T.42S.	R.16W.	13	ROW	HIGHWAY/ROAD ROW	2.56
T.42S.	R.16W.	13	SG-6-2-13-3412	LENORA PHILLIPS	0.12
T.42S.	R.16W.	13	SG-6-2-13-3412	LENORA PHILLIPS	0.82
T.42S.	R.16W.	13	STATE	STATE OF UTAH	20.84
T.42S.	R.16W.	14	BOWLER, ENCE & MARSH SUBDIVISION		4.49
T.42S.	R.16W.	14	SG-6-2-14-111	AMSCO WINDOWS	0.67
T.42S.	R.16W.	14	SG-6-2-14-112	SANTA FE LAND DEV CORP.	5.46
T.42S.	R.16W.	14	SG-6-2-14-122	AMSCO WINDOWS	11.16
T.42S.	R.16W.	14	SG-6-2-14-412	THORLEY CATTLE CO.	10.77
T.42S.	R.16W.	14	SG-6-2-14-413	WA. COUNTY	2.07

This area consists of approximately 1,531 acres, of which 1,090 acres are primarily low-density habitat and approximately 441 acres are high-density desert tortoise habitat. The UDWR has conducted transects in the Padre Canyon area and has found a high number of desert tortoise sign showing it to be a high-density area. The Padre Canyon take area has been reduced to the minimum amount possible to reserve as much of this high-quality habitat as possible. This area has been designated a take area due to its close proximity to urban development, its generally low density of desert tortoises, and its geographic separation from the main high-density core area. An 80-acre area known as Tuacahn is also designated for incidental take. The road to Tuacahn goes through the reserve, and mitigation measures applicable to it are detailed in Chapter 3. Areas to the south of Paradise Canyon are also identified for take and are generally within 1,000 feet of the right-of-way boundary of the proposed extension of Skyline Drive west of Highway 18.

The final "boundaries" for the Padre Canyon area will be developed and approved by Ivins City, after comment by the HCP administrator and the USFWS during the preparation of the Ivins City Master Plan. Recent surveys conducted for the Heritage Arts Foundation show the importance and use of this high-density area by desert tortoises. The mayor of Ivins has agreed to work with the USFWS and Washington County in developing measures that reduce impacts to this population, which is bisected by the Tuacahn Road. The Master Plan would allow for a level of development that maintains the ecological integrity of the area where reasonably possible. It is envisioned that fencing, compatible with development and protecting desert tortoises, will need to be included in certain, yet-to-be identified areas of the Master Plan.

Washington County has dedicated $10,000 for the installation of a road culvert in Padre Canyon and will dedicate an additional $5,000 of the tortoise research money towards the study of

tortoise population dynamics in this area. The study design and principal investigator will be determined by the HCP administrator in cooperation with the UDWR and the USFWS.

No request for incidental take has been made for Snow Canyon State Park. The Park is currently preparing a Master Plan which may recommend the construction of additional facilities. Any need for incidental take in Snow Canyon State Park will be done by amendment to this HCP. Further, the development of a desert tortoise plan for the Park, funded by the HCP, should identify ways to avoid and minimize take within Park boundaries.

4.3.3 Winchester Hills Take Area

The Winchester Hills Take Area consists of approximately 3,092 acres of land north of Paradise Canyon and east of Snow Canyon State Park at 3,500 to 4,000 feet in elevation. The area is graphically depicted in Figure 4.4, and a list of property owners and legal descriptions are presented in Table 4.5.

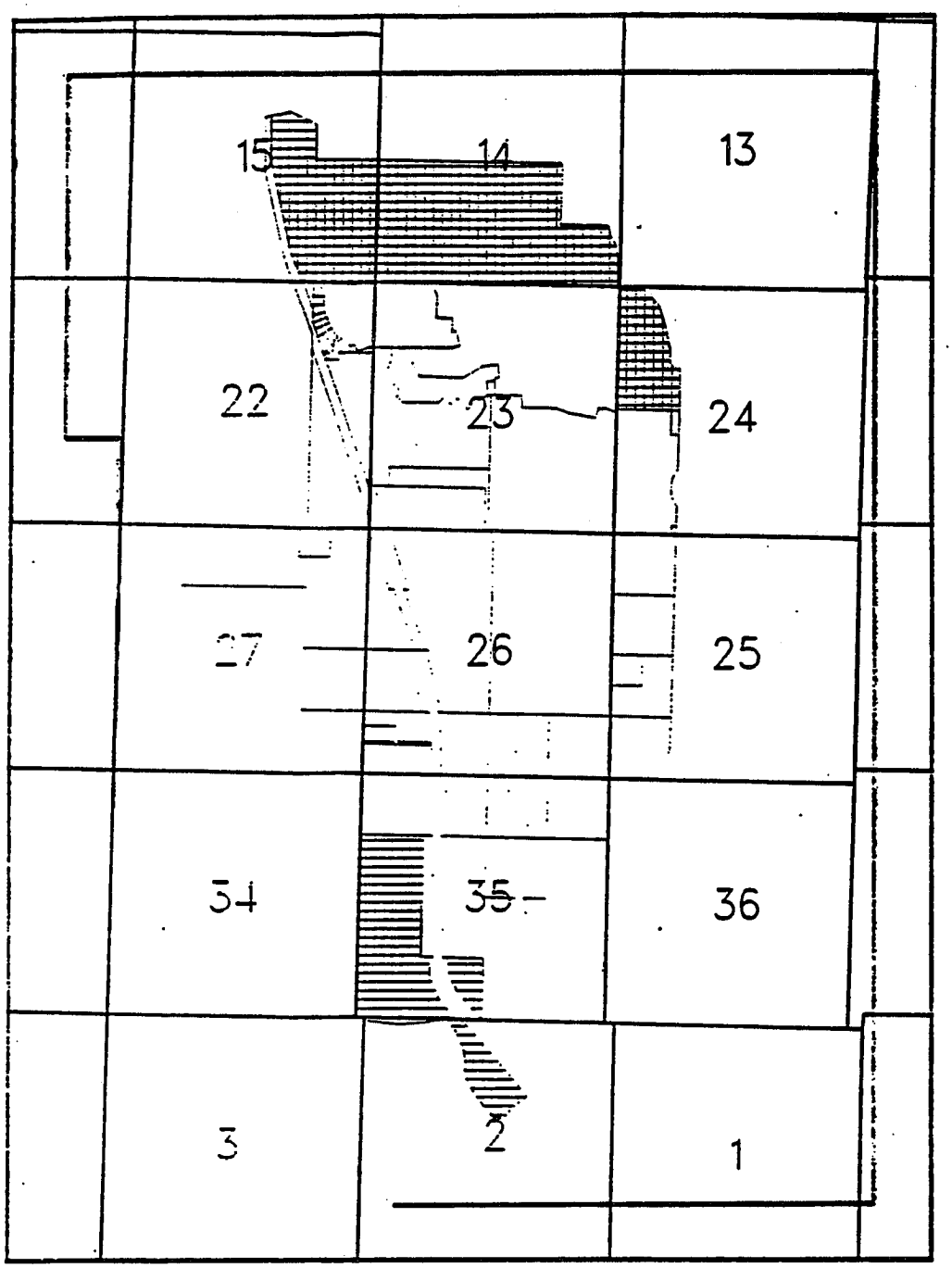
The Winchester Hills area is currently undergoing residential development. This area is characterized as low density, with a pocket of high-density habitat in the southern portion of the property. It has been included in the take area due to its generally low density of desert tortoises, high potential for development, and marginal benefit of acquisition. Private property in Section 35, bounded by a line 20 feet west of the west rim of Buckskin Canyon, has been included in the reserve due to habitat characteristics and to preserve a desert tortoise movement corridor.

Table 4.5. Parcel Information for the Winchester Hills Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	14	STATE	STATE OF UTAH	277.77
T.41S.	R.16W.	15	ROW	HIGHWAY/ROAD ROW	13.08
T.41S.	R.16W.	15	STATE	STATE OF UTAH	140.08
T.41S.	R.16W.	22	7259-A	SHAD INVESTMENT & DEVELOPMENT CORP.	60.93
T.41S.	R.16W.	22	7259-B	SHAD INVESTMENT & DEVELOPMENT CO.	3.80
T.41S.	R.16W.	22	7259-C	UTAH STATE PARK & RECREATION	1.58
T.41S.	R.16W.	22	7261-A-1-B	SHAD INVESTMENT & DEVELOPMENT CORP.	34.98
T.41S.	R.16W.	22	7261-B-1	FIRST INTERSTATE BANK OF UTAH	1.13
T.41S.	R.16W.	22	7261-B-2	FIRST INTERSTATE BANK OF UTAH	0.97
T.41S.	R.16W.	22	7261-B-3	FIRST INTERSTATE BANK OF UTAH	1.04
T.41S.	R.16W.	22	7261-B-4	FIRST INTERSTATE BANK OF UTAH	0.91
T.41S.	R.16W.	22	7261-B-5	FRANK W. & THELMA L. DOWNING	1.02
T.41S.	R.16W.	22	7261-B-6	ROY D. & LAVONNA K. CORDER	1.12
T.41S.	R.16W.	22	7261-B-7	WHITE CLIFFS INVESTMENT CO.	1.23
T.41S.	R.16W.	22	7261-B-8	EAGLEBROOK CORP.	1.59
T.41S.	R.16W.	22	ROW	HIGHWAY/ROAD ROW	21.91
T.41S.	R.16W.	22	WINCHESTER HILLS SUBDIVISION		31.50
T.41S.	R.16W.	23	7261-A-1-A	SHAD INVESTMENT & DEVELOPMENT CORP.	21.60
T.41S.	R.16W.	23	7261-A-1-B	SHAD INVESTMENT & DEVELOPMENT CORP.	96.22
T.41S.	R.16W.	23	7261-A-1-C	CANYON VIEW INC.	47.26
T.41S.	R.16W.	23	7261-A-1-D	JOSEPH C. JR & MARY LOU PEARSON	1.12
T.41S.	R.16W.	23	7265-B-1	EAGLEBROOK CORP.	170.00
T.41S.	R.16W.	23	ROW	HIGHWAY/ROAD ROW	5.08
T.41S.	R.16W.	23	WINCHESTER HILLS SUBDIVISION		47.89
T.41S.	R.16W.	23	WINCHESTER HILLS 2 SUBDIVISION		219.55
T.41S.	R.16W.	23	WINCHESTER HILLS 3 SUBDIVISION		34.84
T.41S.	R.16W.	24	7265-A	WHITE CLIFFS INVESTMENT CO.	0.44
T.41S.	R.16W.	24	7265-B-1	EAGLEBROOK CORP.	77.03
T.41S.	R.16W.	24	7265-C	PACIFIC CORP.	1.99
T.41S.	R.16W.	24	STATE	STATE OF UTAH	64.71
T.41S.	R.16W.	25	7266-A	DEMAR LTD.	36.69
T.41S.	R.16W.	25	7266-B	WHITE CLIFFS INVESTMENT CO.	39.59
T.41S.	R.16W.	25	7270-A-1	WHITE CLIFFS INVESTMENT CO.	38.88
T.41S.	R.16W.	25	7270-A-1	WHITE CLIFFS INVESTMENT CO.	28.96
T.41S.	R.16W.	25	7270-B	J & J MILL & LUMBER CO.	9.99
T.41S.	R.16W.	26	7267-A	DEMAR LTD.	31.76
T.41S.	R.16W.	26	7267-B	WHITE CLIFFS INVESTMENT CO.	146.37
T.41S.	R.16W.	26	7267-B	WHITE CLIFFS INVESTMENT CO.	30.17
T.41S.	R.16W.	26	7270-A-2	DEMAR LTD.	31.22
T.41S.	R.16W.	26	7270-A-2	DEMAR LTD.	0.14
T.41S.	R.16W.	26	7270-A-3	R. LYNN & JANECE GARDNER TR	2.57
T.41S.	R.16W.	26	7270-A-4	DEMAR LTD.	40.15
T.41S.	R.16W.	26	7270-A-5	DEMAR LTD.	40.74
T.41S.	R.16W.	26	7270-A-6	C. JUDD & JANICE B. BURGESS	5.02
T.41S.	R.16W.	26	7270-A-7	CLIVE M. & JOAN P. BURGESS	4.80
T.41S.	R.16W.	26	7270-A-8	JOE & DORIS HUTCHINGS	6.21
T.41S.	R.16W.	26	7270-C	TONY & CINDY CANNON	4.94
T.41S.	R.16W.	26	7270-D	MICHAEL J. & MICHAELA B.	5.08
T.41S.	R.16W.	26	7270-E	JUDD & JANICE BURGESS	5.05

Table 4.5. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.16W.	26	7270-F	JAY W. & BRENDA B. MCALLISTER	4.98
T.41S.	R.16W.	26	7270-G	GARY D. & LANCE B. ALLRED	5.14
T.41S.	R.16W.	26	7271-B	WHITE CLIFFS INVESTMENT CO.	238.48
T.41S.	R.16W.	26	ROW	HIGHWAY/ROAD ROW	18.36
T.41S.	R.16W.	26	ROW	HIGHWAY/ROAD ROW	19.07
T.41S.	R.16W.	27	7273-A-1	WHITE CLIFFS INVESTMENT CO.	146.01
T.41S.	R.16W.	27	7273-A-2	EAGLEBROOK CORP.	9.29
T.41S.	R.16W.	27	7273-B-1	DEMAR LTD.	40.10
T.41S.	R.16W.	27	7273-B-2	DEMAR LTD.	39.64
T.41S.	R.16W.	35	7284	JEL DEVELOPMENT LTD.	13.51
T.41S.	R.16W.	35	7284	JEL DEVELOPMENT LTD.	248.63
T.41S.	R.16W.	35	7284-A-1-NP	DEMAR LTD.	39.83
T.41S.	R.16W.	35	7284-A-1-NP	DEMAR LTD.	26.15
T.41S.	R.16W.	35	7284-A-2-NP	JEL DEVELOPMENT LTD.	39.37
T.41S.	R.16W.	35	7284-A-3	DEMAR LTD.	39.32
T.41S.	R.16W.	35	7284-B	LOWELL & JULIE FREI	0.67
T.41S.	R.16W.	35	7284-C	LEE E. & VALORIE H. SNOW	0.83
T.41S.	R.16W.	35	JEL RANCH	SUBDIVISION	41.41
T.41S.	R.16W.	35	ROW	HIGHWAY/ROAD ROW	38.23
T.41S.	R.16W.	35	STATE	STATE OF UTAH	15.51
T.41S.	R.16W.	35	STATE	STATE OF UTAH	131.88
T.42S.	R.16W.	02	ROW	HIGHWAY/ROAD ROW	9.53
T.42S.	R.16W.	02	SG-6-2-2-110	STATE OF UTAH	36.62



Private

State of Utah

09/27/95

Figure 4.4. Winchester Hills Take Area

4.3.4 St. George Take Areas

Several areas adjacent to the proposed reserve on the north side of the City of St. George between Highway 18 and the Washington City boundary are proposed for incidental take under this HCP. They are not included in the proposed reserve due to their proximity to urban development and existing urban impacts. There are also three small populations of desert tortoises south of the City of St. George which are designated for take due to their isolation from the reserve, their proximity to urban development, and the inability to manage these areas effectively. In total, these areas comprise 2,137 acres of primarily low-density habitat. They are depicted in Figure 4.5, and land ownership information is presented in Table 4.6.

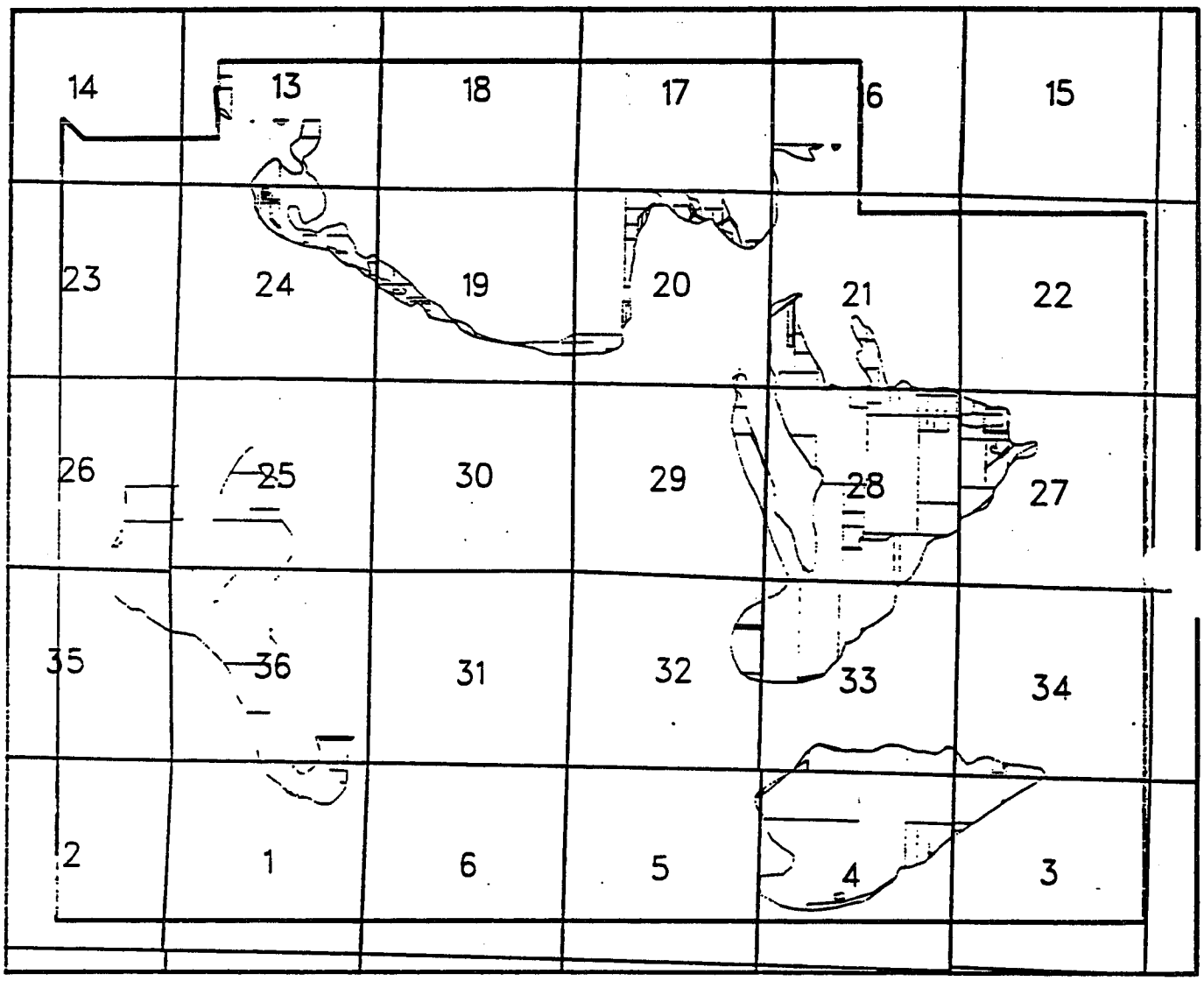


Figure 4.5. St. George Take Areas

Table 4.6. Parcel Information for the St. George Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	16	SG-5-2-16-32	GERALD BLAKE TRUSTEE	0.47
T.42S.	R.15W.	16	SG-5-2-16-33	BONNIE & LOUIS M. MICKELSON	7.02
T.42S.	R.15W.	16	SG-5-2-16-33	BONNIE & LOUIS M. MICKELSON	1.95
T.42S.	R.15W.	16	SG-5-2-16-34	CITY OF ST. GEORGE	0.21
T.42S.	R.15W.	19	BALI HI 2	SUBDIVISION	1.49
T.42S.	R.15W.	19	BALI HI 2	SUBDIVISION	1.25
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	2.28
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	1.68
T.42S.	R.15W.	19	MUNICIPAL	MUNICIPAL	5.00
T.42S.	R.15W.	19	RED BLUFF	SUBDIVISION	0.00
T.42S.	R.15W.	19	ROW	HIGHWAY/ROAD ROW	0.22
T.42S.	R.15W.	19	ROW	HIGHWAY/ROAD ROW	2.53
T.42S.	R.15W.	19	SG-1344	CITY OF ST. GEORGE	2.35
T.42S.	R.15W.	19	SG-1361-B-1	J AND J MILL AND LUMBER COMPANY	0.01
T.42S.	R.15W.	19	SG-1361-B-3	J AND J MILL AND LUMBER COMPANY	0.09
T.42S.	R.15W.	19	SG-1660-A	ST. GEORGE CITY	3.32
T.42S.	R.15W.	19	SG-1661-A-1	KAY WILKINSON AND DAVID WOODBURY	0.27
T.42S.	R.15W.	19	SG-1661-A-2-A	WALTER AND CAROL PALMER	0.05
T.42S.	R.15W.	19	SG-1665-A	CITY OF ST. GEORGE	0.77
T.42S.	R.15W.	19	SG-1666-A	LARRY BLAKE, TR	0.39
T.42S.	R.15W.	19	SG-1666-B	LAURA MOODY THOMAS	0.86
T.42S.	R.15W.	19	SG-1669-A-2-B	ANDREW AND HILMA HOLT	0.01
T.42S.	R.15W.	19	SG-1669-A-2-E	LAURA BLAIR	0.01
T.42S.	R.15W.	19	SG-1715-1-B-N-1	D.K. AND ALENE ADAMS	0.49
T.42S.	R.15W.	19	SG-1715-A-3	LDS CORPORATION OF PRES. OF CHURCH	0.15
T.42S.	R.15W.	19	SG-1715-A-6	CARL AND COLLEEN ODEKIRK, TRS	0.18
T.42S.	R.15W.	19	SG-1715-A-C-N	D.K. ADAMS	1.17
T.42S.	R.15W.	19	SG-1715-B	ROBERT AND BEVERLY BULLOCK	0.02
T.42S.	R.15W.	19	SG-1734-A-1-B-1	CITY OF ST. GEORGE	4.23
T.42S.	R.15W.	19	SG-1734-A-3-B-1	WASHINGTON COUNTY	2.36
T.42S.	R.15W.	19	SG-1743-A	TANA & WARREN COX	2.66
T.42S.	R.15W.	19	SG-1743-B	DALE & FERN GIBSON	4.73
T.42S.	R.15W.	19	SG-1763	CITY OF ST. GEORGE	0.79
T.42S.	R.15W.	19	SG-5-2-19-21	ST. GEORGE CITY	0.01
T.42S.	R.15W.	20	BIG WHEEL	SUBDIVISION	0.55
T.42S.	R.15W.	20	BIG WHEEL 2	SUBDIVISION	1.42
T.42S.	R.15W.	20	MUNICIPAL	MUNICIPAL	0.26
T.42S.	R.15W.	20	MUNICIPAL	MUNICIPAL	1.29
T.42S.	R.15W.	20	MUNICIPAL	MUNICIPAL	1.47
T.42S.	R.15W.	20	MUNICIPAL	MUNICIPAL	10.48
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	0.68
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	0.80
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	0.24
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	0.04
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	1.66
T.42S.	R.15W.	20	ROW	HIGHWAY/ROAD ROW	0.07
T.42S.	R.15W.	20	SG-1734-A-3-B-1	WASHINGTON COUNTY	3.55

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	20	SG-1745-A	DIXIE MOBILE ESTATES LTD	6.39
T.42S.	R.15W.	20	SG-5-2-20-1100	STOUT INVESTMENT LTD	33.73
T.42S.	R.15W.	20	SG-5-2-20-1101	DONA NAD LONEVA RUESCH	3.98
T.42S.	R.15W.	20	SG-5-2-20-1102	STOUT INVESTMENTS	1.54
T.42S.	R.15W.	20	SG-5-2-20-1103	KSSST CORPORATION	0.92
T.42S.	R.15W.	20	SG-5-2-20-1210	TWIN LAKES RESORT INC.	0.16
T.42S.	R.15W.	20	SG-5-2-20-1210	TWIN LAKES RESORT INC.	0.04
T.42S.	R.15W.	20	SG-5-2-20-12110	CLEO R. ATKIN TR	1.09
T.42S.	R.15W.	20	SG-5-2-20-1212	TWIN LAKES RESORT INC.	0.13
T.42S.	R.15W.	20	SG-5-2-20-1410	SUN CAPITAL BANK	5.45
T.42S.	R.15W.	20	SG-5-2-20-1411	CITY OF ST. GEORGE	5.15
T.42S.	R.15W.	20	SG-5-2-20-14120	RANDALL DISTRIBUTING INC	2.38
T.42S.	R.15W.	20	SG-5-2-20-1421	ROCKY MOUNTAIN CO.	1.07
T.42S.	R.15W.	20	SG-5-2-20-1422	KSSST CORP	0.43
T.42S.	R.15W.	20	SG-5-2-20-14341	PACIFIC COAST BUILDING PRODUCTS INC.	3.27
T.42S.	R.15W.	20	SG-5-2-20-1444	ARDELLA CARPENTER	0.46
T.42S.	R.15W.	20	SG-5-2-20-14451	G.M. ALDRED AND SONS CORP.	3.90
T.42S.	R.15W.	20	SG-5-2-20-205	ZION FACTORY STORES 2	0.59
T.42S.	R.15W.	20	SG-5-2-20-4115	E, L, & S BLAKE;D & C TERRY; A CARTER	8.60
T.42S.	R.15W.	20	SG-5-2-20-4118	GERABLINE & RUKR HUFF	0.87
T.42S.	R.15W.	20	SG-5-2-20-4119	RED ROCK INDUSTRIAL COMPLEX	4.14
T.42S.	R.15W.	20	SG-5-2-20-4122	A. KENT & LAURA COTTAM	0.04
T.42S.	R.15W.	20	SG-5-2-20-4123	RED ROCK IND. COMPLEX	3.14
T.42S.	R.15W.	20	SG-5-2-20-4124	CONNIE JACKSON	0.48
T.42S.	R.15W.	20	SG-5-2-20-4125	RUSSELL LIMB	1.38
T.42S.	R.15W.	20	SG-5-2-20-4126	RUSSELL LIMB	1.04
T.42S.	R.15W.	20	SG-5-2-20-4127	A.KENT & LAVEA COTTAM	0.24
T.42S.	R.15W.	20	SG-5-2-20-41281	WESTERN ROCK PROD.	4.10
T.42S.	R.15W.	20	SG-5-2-21-33031	D. SCOTT HOUSTON	0.03
T.42S.	R.15W.	20	SG-5-2-29-11010	SCOTT HUSTON	1.92
T.42S.	R.15W.	20	WACO	WASHINGTON COUNTY	0.23
T.42S.	R.15W.	21	CIMARRON AT RED CL C SUBDIVISION		1.24
T.42S.	R.15W.	21	CIMARRON AT RED CL D SUBDIVISION		5.51
T.42S.	R.15W.	21	CIMARRON AT RED CL E SUBDIVISION		3.13
T.42S.	R.15W.	21	COTTON ACRES 4 SUBDIVISION		0.96
T.42S.	R.15W.	21	COTTON ACRES 4 SUBDIVISION		0.10
T.42S.	R.15W.	21	COTTON ACRES 4 SUBDIVISION		0.05
T.42S.	R.15W.	21	ROW	HIGHWAY/ROAD ROW	3.64
T.42S.	R.15W.	21	ROW	HIGHWAY/ROAD ROW	0.56
T.42S.	R.15W.	21	ROW	HIGHWAY/ROAD ROW	0.12
T.42S.	R.15W.	21	ROW	HIGHWAY/ROAD ROW	0.04
T.42S.	R.15W.	21	SANTA FE AT RED CL 2 SUBDIVISION		0.19
T.42S.	R.15W.	21	SANTA FE AT RED CL 2 SUBDIVISION		0.02
T.42S.	R.15W.	21	SG-5-2-21-2206	GOLF VENTURES INC.	0.09
T.42S.	R.15W.	21	SG-5-2-21-2302	WASHINGTON COUNTY BOARD OF EDUCATION	1.70
T.42S.	R.15W.	21	SG-5-2-21-2303	WASHINGTON COUNTY BOARD OF EDUCATION	3.45
T.42S.	R.15W.	21	SG-5-2-21-3102	ROCKY MOUNTAIN PRODUCE COMPANY	4.21

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	21	SG-5-2-21-3103	RED CLIFFS MALL LTD	2.74
T.42S.	R.15W.	21	SG-5-2-21-3200	ROCKY MOUNTAIN PRODUCE COMPANY	0.73
T.42S.	R.15W.	21	SG-5-2-21-3200	ROCKY MOUNTAIN PRODUCE COMPANY	3.66
T.42S.	R.15W.	21	SG-5-2-21-3201	ROCKY MOUNTAIN CO.	1.94
T.42S.	R.15W.	21	SG-5-2-21-3201	ROCKY MOUNTAIN CO.	0.52
T.42S.	R.15W.	21	SG-5-2-21-3301	ROCKY MOUNTAIN PRODUCE COMPANY	6.91
T.42S.	R.15W.	21	SG-5-2-21-3302	ROCKY MOUNTAIN PRODUCE COMPANY	10.00
T.42S.	R.15W.	21	SG-5-2-21-33031	D. SCOTT HOUSTON	23.47
T.42S.	R.15W.	21	SG-5-2-21-3304	ALLPRO INC.	3.71
T.42S.	R.15W.	21	SG-5-2-21-343	H. CLARK HOUSTON & WARREN L. HANNIG	1.07
T.42S.	R.15W.	21	SG-5-2-21-344	SCOTT HOUSTON	0.92
T.42S.	R.15W.	21	SG-5-2-21-422	FIRST SECURITY BANK OF UTAH	2.97
T.42S.	R.15W.	21	SGM-21-2	WILLIAM AND ARLENE MICKELSEN	2.82
T.42S.	R.15W.	27	OTHER	OTHER (RIVER BED)	2.45
T.42S.	R.15W.	27	OTHER	OTHER (RIVER BED)	1.08
T.42S.	R.15W.	27	RIO DEL SOL	SUBDIVISION	0.04
T.42S.	R.15W.	27	RIVER BEND PLAT B	SUBDIVISION	4.72
T.42S.	R.15W.	27	RIVER BEND PLAT B	SUBDIVISION	0.24
T.42S.	R.15W.	27	RIVER BEND PLAT B	SUBDIVISION	12.36
T.42S.	R.15W.	27	RIVER RIDGE 1	SUBDIVISION	2.95
T.42S.	R.15W.	27	ROW	HIGHWAY/ROAD ROW	0.51
T.42S.	R.15W.	27	ROW	HIGHWAY/ROAD ROW	2.67
T.42S.	R.15W.	27	SG-5-2-27-3440	J & S FARMS	12.42
T.42S.	R.15W.	27	SG-5-2-27-41	WANDA I S KURT LTD	4.06
T.42S.	R.15W.	27	SG-5-2-27-420	EDMUND AND JENIEL HOWELL, TRS	0.69
T.42S.	R.15W.	27	SG-5-2-27-420	EDMUND AND JENIEL HOWELL, TRS	0.02
T.42S.	R.15W.	27	SG-5-2-27-4301	GROUP MANAGEMENT INC., TR	21.76
T.42S.	R.15W.	27	SG-5-2-27-43021	T S RAINBOW INC	9.15
T.42S.	R.15W.	27	SG-5-2-27-4303	VERN PETTY	4.14
T.42S.	R.15W.	27	SUNFLOWER GARDEN 1	SUBDIVISION	4.70
T.42S.	R.15W.	27	SUNFLOWER GARDEN 2	SUBDIVISION	1.94
T.42S.	R.15W.	27	WALTERS	SUBDIVISION	3.67
T.42S.	R.15W.	28	COTTON ACRES 1	SUBDIVISION	3.50
T.42S.	R.15W.	28	COTTON ACRES 2	SUBDIVISION	3.32
T.42S.	R.15W.	28	COTTON ACRES 3	SUBDIVISION	3.59
T.42S.	R.15W.	28	COTTON ACRES 4	SUBDIVISION	3.66
T.42S.	R.15W.	28	COTTON ACRES 4	SUBDIVISION	0.03
T.42S.	R.15W.	28	COTTON ACRES 5	SUBDIVISION	3.44
T.42S.	R.15W.	28	COTTON ACRES 6	SUBDIVISION	2.25
T.42S.	R.15W.	28	FOSTER HILLS 1	SUBDIVISION	6.00
T.42S.	R.15W.	28	FOSTER HILLS 2	SUBDIVISION	3.99
T.42S.	R.15W.	28	RIVER BEND PLAT B	SUBDIVISION	2.03
T.42S.	R.15W.	28	SG-5-2-21-3200	ROCKY MOUNTAIN PRODUCE COMPANY	0.60
T.42S.	R.15W.	28	SG-5-2-21-33031	D. SCOTT HOUSTON	1.00
T.42S.	R.15W.	28	SG-5-2-28-1120	R AND R PARTNERSHIP	1.00
T.42S.	R.15W.	28	SG-5-2-28-1121	LDS CORP OF PRES OF CHURCH	2.16
T.42S.	R.15W.	28	SG-5-2-28-1122	RULON A FOSTER, TR	3.00
T.42S.	R.15W.	28	SG-5-2-28-1123	LDS CORP OF PRES OF CHURCH	1.93

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	28	SG-5-2-28-1201	GROUP MANAGEMENT INC., TR	55.31
T.42S.	R.15W.	28	SG-5-2-28-1301	PAM HUMPHRIES	108.47
T.42S.	R.15W.	28	SG-5-2-28-140	ROCKY MOUNTAIN PRODUCE COMPANY	3.00
T.42S.	R.15W.	28	SG-5-2-28-142	JKR DEVELOPMENT	6.72
T.42S.	R.15W.	28	SG-5-2-28-2101	J AND S FARMS LTD	23.02
T.42S.	R.15W.	28	SG-5-2-28-2200	J AND S FARMS	18.54
T.42S.	R.15W.	28	SG-5-2-28-2302	J AND S FARMS	5.06
T.42S.	R.15W.	28	SG-5-2-28-2303	ANTHONY FOREMASTER LTD	3.05
T.42S.	R.15W.	28	SG-5-2-28-3101	J.O.E. INC.	7.95
T.42S.	R.15W.	28	SG-5-2-28-3102	ZIONS COOP. MERC. INSTITUTION	6.91
T.42S.	R.15W.	28	SG-5-2-28-3103	ORVIN NIELSEN	5.09
T.42S.	R.15W.	28	SG-5-2-28-3104	OLVIN NIELSON	9.90
T.42S.	R.15W.	28	SG-5-2-28-3105	DOWN TO DIXIE, INC.	0.50
T.42S.	R.15W.	28	SG-5-2-28-3106	JUNE MITCHELL, TR	47.93
T.42S.	R.15W.	28	SG-5-2-28-3301	FOREMASTER FAMILY LIMITED PARTNERSHIP	26.96
T.42S.	R.15W.	28	SG-5-2-28-4100	ROCKY MOUNTAIN PRODUCE COMPANY	5.56
T.42S.	R.15W.	28	SG-5-2-28-4103	ROCKY MOUNTAIN PRODUCE COMPANY	104.92
T.42S.	R.15W.	28	SG-5-2-28-411	CLEAR CREEK DEVELOPMENT	0.04
T.42S.	R.15W.	28	SG-5-2-28-411	CLEAR CREEK DEVELOPMENT	0.10
T.42S.	R.15W.	28	SG-5-2-28-430	CLEAR CREEK DEVELOPMENT	0.05
T.42S.	R.15W.	28	SG-5-2-33-423	ANTHONY FOREMASTER LTD	35.50
T.42S.	R.15W.	29	SG-1738-A	SETTLER'S RV PARK INC.	7.45
T.42S.	R.15W.	29	SG-5-2-20-205	ZION FACTORY STORES 2	0.17
T.42S.	R.15W.	29	SG-5-2-28-430	CLEAR CREEK DEVELOPMENT	0.90
T.42S.	R.15W.	29	SG-5-2-29-1101	TRIPLE H	0.04
T.42S.	R.15W.	29	SG-5-2-29-11010	SCOTT HUSTON	2.38
T.42S.	R.15W.	29	SG-5-2-29-1102	EAST RIDGE MOTEL COMPANY	1.31
T.42S.	R.15W.	29	SG-5-2-29-1200	FOREMASTER FAMILY LIMITED PARTNERSHIP	21.74
T.42S.	R.15W.	32	ROW	HIGHWAY/ROAD ROW	1.47
T.42S.	R.15W.	32	SG-5-2-32-1101	LLOYD JENNINGS AND ANNIE MCARCHUR, TRS	7.72
T.42S.	R.15W.	32	SG-5-2-32-1102	ANTHONY FOREMASTER, LTD	22.21
T.42S.	R.15W.	32	SG-5-2-32-2101	LEON AND ANNIE JENNINGS	1.65
T.42S.	R.15W.	33	ROW	HIGHWAY/ROAD ROW	1.12
T.42S.	R.15W.	33	ROW	HIGHWAY/ROAD ROW	0.04
T.42S.	R.15W.	33	ROW	HIGHWAY/ROAD ROW	0.06
T.42S.	R.15W.	33	ROW	HIGHWAY/ROAD ROW	0.11
T.42S.	R.15W.	33	ROW	HIGHWAY/ROAD ROW	0.70
T.42S.	R.15W.	33	SG-5-2-28-2302	J AND S FARMS	0.15
T.42S.	R.15W.	33	SG-5-2-32-2200	SHELCO LTD	1.42
T.42S.	R.15W.	33	SG-5-2-33-1301	J & S FARMS	0.04
T.42S.	R.15W.	33	SG-5-2-33-1303	J & S FARMS	0.10
T.42S.	R.15W.	33	SG-5-2-33-2203	CLIFF STONE	20.09
T.42S.	R.15W.	33	SG-5-2-33-2300	SCHMUTZ RANCH LTD	21.07
T.42S.	R.15W.	33	SG-5-2-33-3200	RAY S SCHMUTX FAMILY PARTNERSHIP	19.48
T.42S.	R.15W.	33	SG-5-2-33-4102	JUNE MITCHELL	0.17
T.42S.	R.15W.	33	SG-5-2-33-4102	JUNE MITCHELL	60.71
T.42S.	R.15W.	33	SG-5-2-33-423	ANTHONY FOREMASTER LTD	47.25
T.42S.	R.15W.	33	SG-5-2-33-4301	FOREMASTER FAMILY LIMITED PARTNERSHIP	58.89

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	33	SG-5-3-4-4102	CLIFF STONE	1.42
T.42S.	R.15W.	34	ROW	HIGHWAY/ROAD ROW	0.60
T.42S.	R.15W.	34	SG-5-2-34-3200	DON AND MERLENE SCMUTZ	9.58
T.42S.	R.15W.	34	SG-5-2-34-3200	DON AND MERLENE SCMUTZ	6.39
T.42S.	R.15W.	34	SG-5-2-34-3301	SCOTT AND SHERRY TRUMAN	2.22
T.42S.	R.15W.	34	SG-5-2-34-3303	CLIFF STONE	2.84
T.42S.	R.16W.	13	MUNICIPAL	MUNICIPAL	17.07
T.42S.	R.16W.	13	RED CLIFF	SUBDIVISION	0.95
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	5.26
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	0.27
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	0.29
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	0.01
T.42S.	R.16W.	13	SG-6-2-13-3100	CITY OF ST. GEORGE	9.08
T.42S.	R.16W.	13	SG-6-2-13-3410	CHARLES & GERALDINE PHILLIPS	6.01
T.42S.	R.16W.	13	SG-6-2-13-4300	ELTON & VERLYN STOUT	2.50
T.42S.	R.16W.	24	CORAL COVE	SUBDIVISION	2.24
T.42S.	R.16W.	24	HIDDEN COVE	SUBDIVISION	0.05
T.42S.	R.16W.	24	PARKVUE A	SUBDIVISION	0.01
T.42S.	R.16W.	24	RED HILLS	SUBDIVISION	4.53
T.42S.	R.16W.	24	ROW	HIGHWAY/ROAD ROW	2.98
T.42S.	R.16W.	24	ROW	HIGHWAY/ROAD ROW	1.20
T.42S.	R.16W.	24	SANDSTONE TERRACE	SUBDIVISION	1.11
T.42S.	R.16W.	24	SG-1709	SUSAN PATTEN	0.29
T.42S.	R.16W.	24	SG-1713-A-1-B	LEO AND MAGDALENE DEAN	0.16
T.42S.	R.16W.	24	SG-1713-A-4	EDWIN AND SOON HWA REBER	0.03
T.42S.	R.16W.	24	SG-1714-A	LEE DOYLE M. & VIRGINIA	2.43
T.42S.	R.16W.	24	SG-1715-A-3	LDS CORPORATION OF PRES. OF CHURCH	0.00
T.42S.	R.16W.	24	SG-1735	WASHINGTON COUNTY	2.21
T.42S.	R.16W.	24	SG-1746-C-1-A	CITY OF ST. GEORGE	2.09
T.42S.	R.16W.	24	SG-1746-C-1-B	HOGAN AND TINGEY CONTRACTORS	0.30
T.42S.	R.16W.	24	SG-1746-C-2	CALVERT AND NORMA WHITEHEAD	0.35
T.42S.	R.16W.	24	SG-1746-C-3	CRAIG AND DEBRA HAMMER	0.37
T.42S.	R.16W.	24	SG-1746-C-5-A	PENN H. SMITH, TR	0.22
T.42S.	R.16W.	24	SG-1746-C-5-B-1-A	DOUGLAS SORENSON	0.23
T.42S.	R.16W.	24	SG-1746-C-5-B-2	FENTON AND CLAIRE MOSS	0.20
T.42S.	R.16W.	24	SG-1746-C-5-C	KIMBERLY PETTIT	0.08
T.42S.	R.16W.	24	SG-1746-C-5-D	KIMBERLY PETTIT	0.20
T.42S.	R.16W.	24	SG-1751-A-1-B	ROSS AND JULIE HURST	0.08
T.42S.	R.16W.	24	SG-1751-F	ALFRED AND ANNETTE UNREIN	3.16
T.42S.	R.16W.	24	SG-1751-F	ALFRED AND ANNETTE UNREIN	0.20
T.42S.	R.16W.	24	SG-1752-A	SANDSTONE TERRACE	9.07
T.42S.	R.16W.	24	SG-1752-B	KAY SMITH	0.69
T.42S.	R.16W.	24	SG-1752-C-1	JERRY & TRUDY J. VIDER	1.62
T.42S.	R.16W.	24	SG-6-2-13-3100	CITY OF ST. GEORGE	37.08
T.42S.	R.16W.	24	SUN STONE 1	SUBDIVISION	1.54
T.42S.	R.16W.	25	SG-1759-N	CITY OF ST. GEORGE	15.25
T.42S.	R.16W.	25	SG-6-2-24-3002	GARRICK INVESTMENT COMPANY	3.11
T.42S.	R.16W.	25	SG-6-2-25-4001	RUDGER ATKIN	1.26

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.16W.	25	SG-6-2-25-4001	RUDGER ATKIN	2.12
T.42S.	R.16W.	25	SG-711-C-1	RUDGER C ATKIN INC	35.53
T.42S.	R.16W.	25	SG-711-C-3	CITY OF ST. GEORGE	5.80
T.42S.	R.16W.	25	SG-711-C-4	CITY OF ST. GEORGE	3.05
T.42S.	R.16W.	25	SG-711-F	ERF ENTERPRISES LTD	7.72
T.42S.	R.16W.	26	ROW	HIGHWAY/ROAD ROW	0.22
T.42S.	R.16W.	26	SG-6-2-26-1001	RUDGER C. ATKIN INC.	27.84
T.42S.	R.16W.	26	SG-6-2-26-2300	CECIL BLAKE	4.12
T.42S.	R.16W.	26	SG-6-2-26-2300	CECIL BLAKE	0.45
T.42S.	R.16W.	26	SG-6-2-26-2312	DARRELL AND KATHLEEN BLAKE	0.67
T.42S.	R.16W.	35	SG-6-2-35-1100	GARY AND BETTY CARTER	41.99
T.42S.	R.16W.	36	ROW	HIGHWAY/ROAD ROW	0.08
T.42S.	R.16W.	36	ROW	HIGHWAY/ROAD ROW	0.03
T.42S.	R.16W.	36	ROW	HIGHWAY/ROAD ROW	0.03
T.42S.	R.16W.	36	ROW	HIGHWAY/ROAD ROW	0.09
T.42S.	R.16W.	36	ROW	HIGHWAY/ROAD ROW	0.09
T.42S.	R.16W.	36	SG-6-2-36-1400	CITY OF ST. GEORGE	5.71
T.42S.	R.16W.	36	SG-6-2-36-1400	CITY OF ST. GEORGE	0.07
T.42S.	R.16W.	36	SG-6-2-36-1400	CITY OF ST. GEORGE	45.26
T.42S.	R.16W.	36	SG-6-2-36-1400	CITY OF ST. GEORGE	0.51
T.42S.	R.16W.	36	SG-6-2-36-201	TONAQUINT INC.	11.44
T.42S.	R.16W.	36	SG-6-2-36-216	C.E.C. INDUSTRIES CORP	1.31
T.42S.	R.16W.	36	SG-6-2-36-223	ST. GEORGE INN	0.22
T.42S.	R.16W.	36	SG-6-2-36-3100	CARY AND BETTY CARTER	29.08
T.42S.	R.16W.	36	SG-6-2-36-4000	GARY AND BETTY CARTER	137.61
T.42S.	R.16W.	36	SG-6-2-36-4001	CITY OF ST. GEORGE	7.68
T.43S.	R.15W.	03	SG-5-3-3-41001	CLIFF STONE	43.78
T.43S.	R.15W.	03	SG-5-3-3-4103	M. GALE LARSEN & HAROLD B. SCHMUTZ	0.10
T.43S.	R.15W.	03	SG-5-3-3-4300	OWEN & ANNA LOU BUNDY TRUSTEES	0.12
T.43S.	R.15W.	03	SG-5-3-3-4300	OWEN & ANNA LOU BUNDY TRUSTEES	0.47
T.43S.	R.15W.	03	SG-5-3-3-4301	RUSSELL AND MYRNA BATEMENT	1.78
T.43S.	R.15W.	04	SG-5-3-4-1100	DAVID AND VERNA SCHMUTZ	6.50
T.43S.	R.15W.	04	SG-5-3-4-1200	HAROLD AND TERESA PAYTON	9.09
T.43S.	R.15W.	04	SG-5-3-4-1201	HAROLD PAYTON	8.11
T.43S.	R.15W.	04	SG-5-3-4-1202	FRANCES E. W. SHAFFER	0.25
T.43S.	R.15W.	04	SG-5-3-4-2100	CLIFF STONE	9.50
T.43S.	R.15W.	04	SG-5-3-4-3101	WASHINGTON COUNTY	0.94
T.43S.	R.15W.	04	SG-5-3-4-4100	SHELCO LTD	1.33
T.43S.	R.15W.	04	SG-5-3-4-41011	EDWARD AND DIXIE COTTAM	251.10
T.43S.	R.15W.	04	SG-5-3-4-4102	CLIFF STONE	73.80
T.43S.	R.15W.	04	SG-5-3-5-11001	SUN RIVER DEVELOPMENT	0.26
T.43S.	R.15W.	05	QUAIL VALLEY	SUBDIVISION	1.15
T.43S.	R.15W.	05	SG-5-3-5-11001	SUN RIVER DEVELOPMENT	0.37
T.43S.	R.16W.	01	ROW	HIGHWAY/ROAD ROW	0.42
T.43S.	R.16W.	01	ROW	HIGHWAY/ROAD ROW	0.01
T.43S.	R.16W.	01	SG-6-3-1-1112	TONAQUINT INC.	1.21
T.43S.	R.16W.	01	SG-6-3-1-1113	CECIL BLAKE TR.	0.16
T.43S.	R.16W.	01	SG-6-3-1-1130	TONAQUINT INC.	19.37

Table 4.6. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.43S.	R.16W.	01	SG-6-3-1-1141	TONAQUINT, INC.	2.45
T.43S.	R.16W.	01	SG-6-3-1-1431	TONAQUINT INC.	7.90
T.43S.	R.16W.	01	SG-6-3-1-1441	TONAQUINT INC	3.38
T.43S.	R.16W.	01	SG-6-3-1-1442	TONAQUINT INC.	7.20

4.3.5 North Washington City Take Area

The North Washington City take area is north of Interstate 15 within a basin surrounded on three sides by the proposed reserve. This is an area where Washington City has constructed significant infrastructure anticipating growth and at the request of the Division of State Lands and Forestry. This area consists of approximately 2,005 acres of desert tortoise habitat on private and State School Trust lands. Information on parcels and legal descriptions are provided in Table 4.7 and depicted in Figure 4.6. Infrastructure already in place includes water, sewer, and power lines, as well as an 18-hole championship golf course, roadways, wells, and water storage tanks. A large development of 1,500–2,000 homes has been planned around the golf course and is ready for construction. In addition, a school site has been identified in the area as well as the need for additional water development. The take area has been designed to ensure that growth can occur to support the golf course and infrastructure commitment while preserving a maximum amount of undisturbed desert tortoise habitat. This area has been designated for take due to impending development, the need for Washington City to support its golf course and infrastructure, the needs of the State School Trust program to obtain revenue from its most developable land, and the ability to develop this area without compromising the integrity of the reserve.

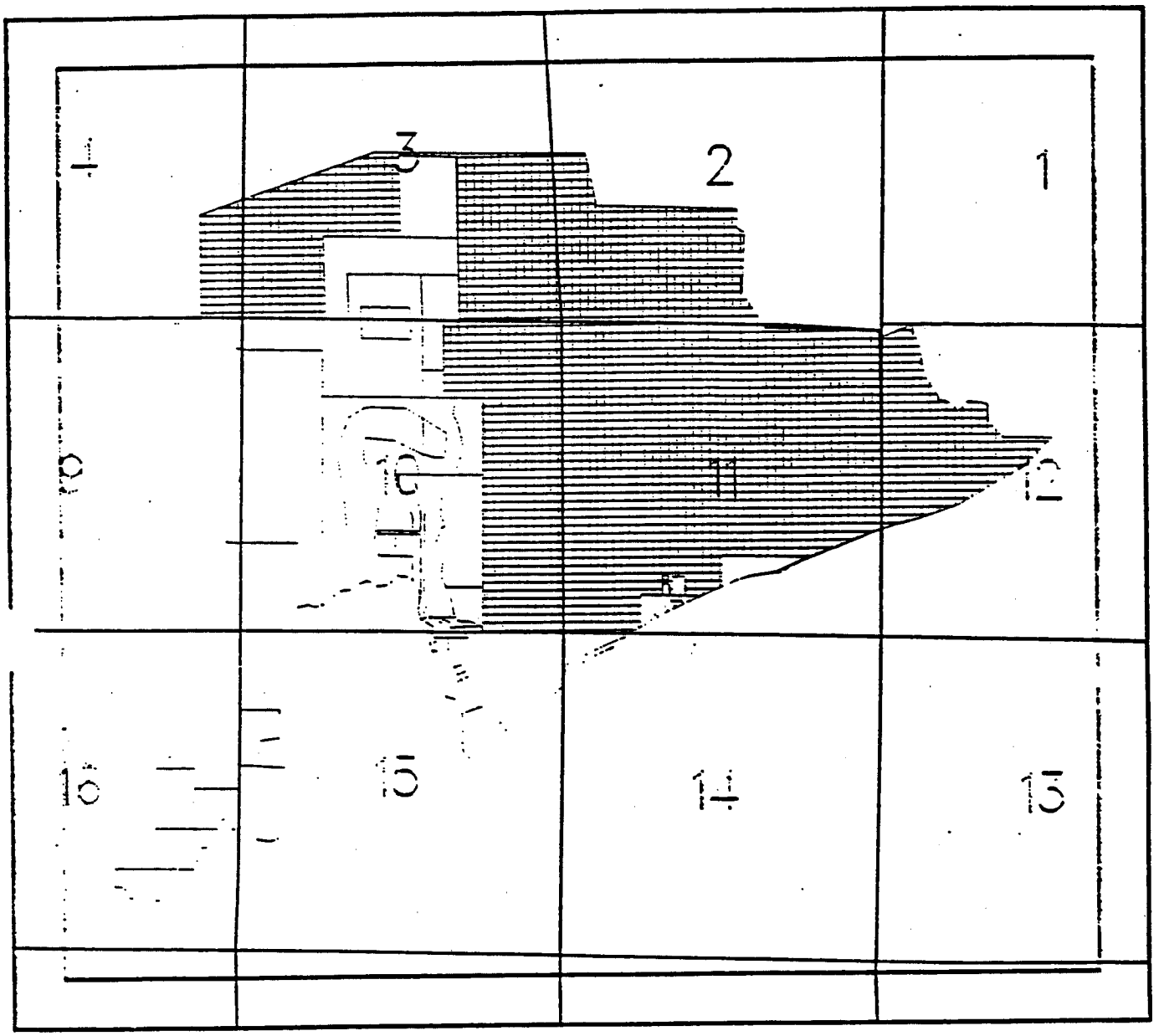


Figure 4.6. North Washington City Take Area

Table 4.7. Parcel Information for North Washington City Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	02	STATE	STATE OF UTAH	150.63
T.42S.	R.15W.	03	6213-TR	STATE OF UTAH	211.23
T.42S.	R.15W.	03	W-5-2-3-230	CITY OF WASHINGTON	38.28
T.42S.	R.15W.	03	W-5-2-3-231	DESERET MUTUAL BENEFIT ASSOC.	17.46
T.42S.	R.15W.	03	W-5-2-3-232	FIRST SECURITY BANK OF UTAH	10.74
T.42S.	R.15W.	03	W-5-2-3-233	WASHINGTON COUNTY BOARD OF ED.	3.81
T.42S.	R.15W.	03	W-5-2-3-240	CITY OF WASHINGTON	29.62
T.42S.	R.15W.	04	STATE	STATE OF UTAH	29.28
T.42S.	R.15W.	09	W-5-2-9-110	DESERET MUTUAL INSURANCE CO.	4.31
T.42S.	R.15W.	09	W-5-2-9-111	DESERET MUTUAL INSURANCE CO.	3.36
T.42S.	R.15W.	09	W-5-2-9-111	DESERET MUTUAL INSURANCE CO.	31.44
T.42S.	R.15W.	09	W-5-2-9-210	DESERET MUTUAL INSURANCE CO.	22.08
T.42S.	R.15W.	10	6213-TR	STATE OF UTAH	177.10
T.42S.	R.15W.	10	BUENA VISTA 4	SUBDIVISION	0.51
T.42S.	R.15W.	10	BUENA VISTA 4	SUBDIVISION	18.58
T.42S.	R.15W.	10	BUENA VISTA 4	SUBDIVISION	2.66
T.42S.	R.15W.	10	BUENA VISTA 4	SUBDIVISION	3.75
T.42S.	R.15W.	10	MUNICIPAL	MUNICIPAL	0.73
T.42S.	R.15W.	10	QUAIL RIDGE	SUBDIVISION	1.38
T.42S.	R.15W.	10	ROW	HIGHWAY/ROAD ROW	3.83
T.42S.	R.15W.	10	W-5-2-10-1310	FIRST SEC. BANK OF UTAH	12.85
T.42S.	R.15W.	10	W-5-2-10-1320	CITY OF WASHINGTON	11.92
T.42S.	R.15W.	10	W-5-2-10-1330	CITY OF WASHINGTON	4.46
T.42S.	R.15W.	10	W-5-2-10-140	NELSON CLAYTON, TR	3.71
T.42S.	R.15W.	10	W-5-2-10-231	MARGARET & PAUL JENSEN	28.96
T.42S.	R.15W.	10	W-5-2-10-232	KEITH BEHUNIN	6.76
T.42S.	R.15W.	10	W-5-2-10-233	WAYNE AND ISABELLE BROOKS	0.13
T.42S.	R.15W.	10	W-5-2-10-234	DOROTHY ANDERSON	1.35
T.42S.	R.15W.	10	W-5-2-10-235	RICHARD AND BERNITA BUCKWALTER	<0.01
T.42S.	R.15W.	10	W-5-2-10-235	RICHARD AND BERNITA BUCKWALTER	<0.01
T.42S.	R.15W.	10	W-5-2-10-236	ROBERT AND MATILDA STEVENS	1.00
T.42S.	R.15W.	10	W-5-2-10-3100	DESERET MUTUAL BENEFIT ASSOC.	30.99
T.42S.	R.15W.	10	W-5-2-10-3100	DESERET MUTUAL BENEFIT ASSOC.	30.10
T.42S.	R.15W.	10	W-5-2-10-3102	LDS CORP OF PRES OF CHURCH	2.27
T.42S.	R.15W.	10	W-5-2-10-3103	LDS CORP OF PRES OF CHURCH	2.44
T.42S.	R.15W.	10	W-5-2-10-3110	WA. CITY	45.05
T.42S.	R.15W.	10	W-5-2-10-312	CITY OF WASHINGTON	0.04
T.42S.	R.15W.	10	W-5-2-10-330	DESERET MUTUAL INSURANCE CO.	107.55
T.42S.	R.15W.	10	W-5-2-10-331	DESERET MUTUAL INSURANCE CO.	30.04
T.42S.	R.15W.	10	W-5-2-10-410	DESERET MUTUAL INSURANCE CO.	59.57
T.42S.	R.15W.	10	W-5-2-3-232	FIRST SECURITY BANK OF UTAH	6.76
T.42S.	R.15W.	10	W-5-2-3-233	WASHINGTON COUNTY BOARD OF ED.	6.02
T.42S.	R.15W.	11	6213-TR	STATE OF UTAH	521.60
T.42S.	R.15W.	11	MUNICIPAL	MUNICIPAL	8.91
T.42S.	R.15W.	11	ROW	HIGHWAY/ROAD ROW	0.53
T.42S.	R.15W.	11	ROW	HIGHWAY/ROAD ROW	<0.01
T.42S.	R.15W.	11	W-194-A-1-NP	PHIL RAY & LYNETTE O. BAKER	0.14
T.42S.	R.15W.	11	W-194-A-3-NP	RICHARD HUNTER, TR	0.01

Table 4.7. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.42S.	R.15W.	11	W-194-A-5	JOHN SIME	0.38
T.42S.	R.15W.	11	W-194-A-6	JOHN SIME	0.31
T.42S.	R.15W.	11	W-194-B-NP	RICHARD HUNTER, TR	0.58
T.42S.	R.15W.	11	W-194-C-NP	RALPH AND LOIS SULLIVAN	3.58
T.42S.	R.15W.	11	W-194-F	M.R. AND C LIMITED PARTNERSHIP	0.86
T.42S.	R.15W.	11	W-208	MORONI FEED COMPANY	0.11
T.42S.	R.15W.	11	WARMS SPRINGS 1 SUBDIVISION		0.17
T.42S.	R.15W.	11	WARMS SPRINGS 1 SUBDIVISION		0.47
T.42S.	R.15W.	11	WARMS SPRINGS 1 SUBDIVISION		1.44
T.42S.	R.15W.	12	STATE	STATE OF UTAH	103.94
T.42S.	R.15W.	14	ROW	HIGHWAY/ROAD ROW	2.14
T.42S.	R.15W.	14	W-168-A-1-A	CITY OF WASHINGTON	7.22
T.42S.	R.15W.	14	W-168-A-1-A	CITY OF WASHINGTON	2.37
T.42S.	R.15W.	15	BUENA VISTA SUBDIVISION		2.78
T.42S.	R.15W.	15	BUENA VISTA 2 SUBDIVISION		5.24
T.42S.	R.15W.	15	BUENA VISTA 3 SUBDIVISION		8.61
T.42S.	R.15W.	15	GREEN SPRING COVE 1 SUBDIVISION		0.02
T.42S.	R.15W.	15	GREEN SPRING COVE 2 SUBDIVISION		8.67
T.42S.	R.15W.	15	QUAIL RIDGE SUBDIVISION		0.41
T.42S.	R.15W.	15	ROW	HIGHWAY/ROAD ROW	0.15
T.42S.	R.15W.	15	W-207-A-1-A	RED LANDS COMPANY	16.43
T.42S.	R.15W.	15	W-207-A-120	CITY OF WASHINGTON	5.56
T.42S.	R.15W.	15	W-207-A-18	HOWARD BARLOW, TR	3.55
T.42S.	R.15W.	15	W-5-2-10-235	RICHARD AND BERNITA BUCKWALTER	0.02
T.42S.	R.15W.	15	W-5-2-10-236	ROBERT AND MATILDA STEVENS	0.67
T.42S.	R.15W.	15	W-5-2-15-11011	BUENA VISTA PROPERTIES LTD	50.45
T.42S.	R.15W.	15	W-5-2-15-1411	ELVA JANE ROUNDY	0.38
T.42S.	R.15W.	15	W-5-2-15-1412	ERNESTINE VASQUEZ	0.28
T.42S.	R.15W.	15	W-5-2-15-1443	DONALD SPURRIER	0.32
T.42S.	R.15W.	15	W-5-2-15-1444	NEIL AND RUBY PACE	0.23
T.42S.	R.15W.	15	W-5-2-15-433	CITY OF WASHINGTON	0.29
T.42S.	R.15W.	16	6225-B	BEAR WEST COMPANY	10.34
T.42S.	R.15W.	16	6225-C	RICHARD J. ROONEY	0.01
T.42S.	R.15W.	16	6225-C	RICHARD J. ROONEY	2.11
T.42S.	R.15W.	16	6225-D	JAMES F. TREES	10.39
T.42S.	R.15W.	16	6225-TR	TERRA TITLE CO. TRUSTEE	14.68
T.42S.	R.15W.	16	SG-5-2-16-2304	TERRA TITLE COMPANY, TR	8.65
T.42S.	R.15W.	16	W-5-2-16-2202	NORMAN & DONNA ESCHLER	0.26
T.42S.	R.15W.	16	W-5-2-16-2206	ROBERT ELLIOTT ET AL.	3.84
T.42S.	R.15W.	16	W-5-2-16-2207	SHERRY ANN DECKER	0.05
T.42S.	R.15W.	16	W-5-2-9-210	DESERET MUTUAL INSURANCE CO.	43.95

4.3.6 Harrisburg/Leeds/Babylon Take Areas

The Harrisburg/Leeds/Babylon take areas include private and State School Trust parcels adjacent to the proposed reserve but outside of its boundaries (see Figure 4.7). These include a parcel of private land on the east edge of the reserve along the Red Cliffs Campground Road as well as parcels adjacent to I-15 in the Leeds area and areas outside of the proposed translocation area in the Babylon area. These areas, totaling 1,540 acres, are depicted in Figure 4.7 and land owners and legal descriptions are identified in Table 4.8.

Table 4.8. Parcel Information for the Harrisburg/Leeds/Babylon Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	07	3273-A	WARREN & JACKELETTA PULSIPITER TR	17.15
T.41S.	R.13W.	07	L-3-1-7-2100	CARLYLE AND GERALDINE STIRLING	0.72
T.41S.	R.13W.	07	L-3-1-7-2102	JACKIE WRIGHT	0.03
T.41S.	R.13W.	07	L-3-1-7-2102	JACKIE WRIGHT	0.70
T.41S.	R.13W.	07	L-3-1-7-2103	JACKIE WRIGHT	1.40
T.41S.	R.13W.	07	L-3-1-7-212	WILLIAM AND KATHERINE STIRLING	0.19
T.41S.	R.13W.	07	L-3-1-7-2410	EDWARD AND IDONNA SNOW	15.79
T.41S.	R.13W.	07	L-3-1-7-2430	MACK AND DIXIE STIRLING	7.41
T.41S.	R.13W.	07	L-3-1-7-321	EDWARD AND IDONNA SNOW	20.06
T.41S.	R.13W.	07	L-89	WARREN & JACKLETTA PULSIPHER, TRS	5.45
T.41S.	R.13W.	07	L-89	WARREN & JACKLETTA PULSIPHER, TRS	2.73
T.41S.	R.13W.	08	L-3-1-8-340	HERMAN CARLYLE STIRLING	2.34
T.41S.	R.13W.	16	3290	5-M INC.	25.25
T.41S.	R.13W.	16	3290	5-M INC.	1.13
T.41S.	R.13W.	16	3290	5-M INC.	3.17
T.41S.	R.13W.	16	3290-NP	STATE OF UTAH	207.89
T.41S.	R.13W.	16	3291	RUTH W. CHRISTIANSEN ET AL.	133.41
T.41S.	R.13W.	17	3292	WILLIAM & CATHERINE STERLING TRS	131.66
T.41S.	R.13W.	18	L-3-1-18-4410	NED & GERALDINE SULLIVAN	27.55
T.41S.	R.13W.	18	L-3-1-18-4411	MERLIN AND TANA SULLIVAN	5.28
T.41S.	R.13W.	19	3294-SA	DIXIE POWER CO.	39.77
T.41S.	R.13W.	19	C-N-04	5M INC.	17.44
T.41S.	R.13W.	19	C1-136	5M INC.	18.57
T.41S.	R.13W.	19	C3-348	PAUL LAMOREUAX	1.80
T.41S.	R.13W.	19	C436-723	5M INC.	5.53
T.41S.	R.13W.	20	C-N-04	5M INC.	1.17
T.41S.	R.13W.	20	C5-259	FOREST COMPANY	12.70
T.41S.	R.13W.	29	3306-A-NP	RICHARD & LUCILLE STOWE TRUST	40.48
T.41S.	R.13W.	30	3306-B-NP	RICHARD & LUCILLE STOWE	91.30
T.41S.	R.13W.	30	3306-C	JOHN R. VOUGHT	8.05
T.41S.	R.13W.	30	C1-136	5M INC.	0.59
T.41S.	R.13W.	30	C3-348	PAUL LAMOREUAX	18.92
T.41S.	R.13W.	30	C4-014	5M INC.	21.64
T.41S.	R.13W.	30	C436-723	5M INC.	12.36
T.41S.	R.13W.	30	H-3-1-30-2201	CHARLES L. APPLEBY, JR	0.76
T.41S.	R.13W.	30	H-3-1-30-3101	WINDING RIVER ASSOCIATES	24.11
T.41S.	R.13W.	30	H-3-1-30-3102	STRATTON BROTHERS	127.68

Table 4.8. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	31	H-3-1-30-3102	STRATTON BROTHERS	9.23
T.41S.	R.14W.	12	SILVER VALLEY 2 SUBDIVISION		1.27
T.41S.	R.14W.	12	SILVER VALLEY 2 SUBDIVISION		0.18
T.41S.	R.14W.	13	4044-A-1	HAROLD H. & DOROTHY FURROW TR	36.72
T.41S.	R.14W.	13	4046-A-1	DALLAS & JUDITH K. MANGUM	10.27
T.41S.	R.14W.	13	4046-A-5	LAWRENCE E. & VICKY I.	8.29
T.41S.	R.14W.	13	L-3-1-18-4410	NED & GERALDINE SULLIVAN	0.59
T.41S.	R.14W.	13	L-4-1-13-130	JOSEPH AND CONNIE BURNS	0.21
T.41S.	R.14W.	13	L-6-A	NED AND GERALDINE SULLIVAN	0.40
T.41S.	R.14W.	13	ROW	HIGHWAY/ROAD ROW	8.70
T.41S.	R.14W.	13	ROW	HIGHWAY/ROAD ROW	2.68
T.41S.	R.14W.	14	4054-B-1-A	DIXIE COVE ESTATE PARTNERSHIP	57.10
T.41S.	R.14W.	14	ROW	HIGHWAY/ROAD ROW	3.41
T.41S.	R.14W.	23	4058-A	DIXIE COVE EST. PART.	71.25
T.41S.	R.14W.	23	4059-A	DIXIE COVE EST. PART.	58.34
T.41S.	R.14W.	23	HARRISBURG ESTATES 1 SUBDIVISION		33.33
T.41S.	R.14W.	23	ROW	HIGHWAY/ROAD ROW	4.95
T.41S.	R.14W.	25	H-4-1-25-2201	STRATTONN BROTHERS	28.23
T.41S.	R.14W.	25	H-4-1-25-2202	JOYCE CHRISTENSEN	10.38
T.41S.	R.14W.	25	H-4-1-25-2203	STRATTON BROTHERS	2.84
T.41S.	R.14W.	25	H-4-1-25-330-DC	WASH. CO. WATER CONSER. DISTRICT	1.83
T.41S.	R.14W.	36	H-4-1-36-100	STATE OF UTAH	35.50
T.41S.	R.14W.	36	H-4-1-36-100	STATE OF UTAH	63.89
T.41S.	R.14W.	36	H-4-1-36-101	WASH. CO. WATER CONSER. DISTRICT	1.19
T.41S.	R.14W.	36	H-4-1-36-2000	STRATTON BROTHERS	9.83
T.41S.	R.14W.	36	H-4-1-36-420-DC	WASH. CO. WATER CONSER. DISTRICT	14.02
T.41S.	R.14W.	36	H-4-1-36-420-DC	WASH. CO. WATER CONSER. DISTRICT	2.52
T.41S.	R.14W.	36	OTHER	OTHER (RIVER BED)	7.45
T.41S.	R.14W.	36	OTHER	OTHER (RIVER BED)	3.80

4.3.7 Hurricane Take Areas

The Hurricane take areas occur on three sides of the Hurricane reserve area (Zone 5): (1) from the western cinder knoll to the western edge of desert tortoise habitat; (2) south of the Quail Creek hydro/UAMPS power line; and (3) east of the eastern cinder knoll. An isolated area, also identified for incidental take, is located just southeast of the town of Hurricane. Most of these areas are already impacted by urban development, including an 80-acre farm, and therefore are designated for take. The Hurricane take areas total 1,411 acres and are depicted in Figure 4.8. Information on land ownership and legal descriptions are provided in Table 4.9.

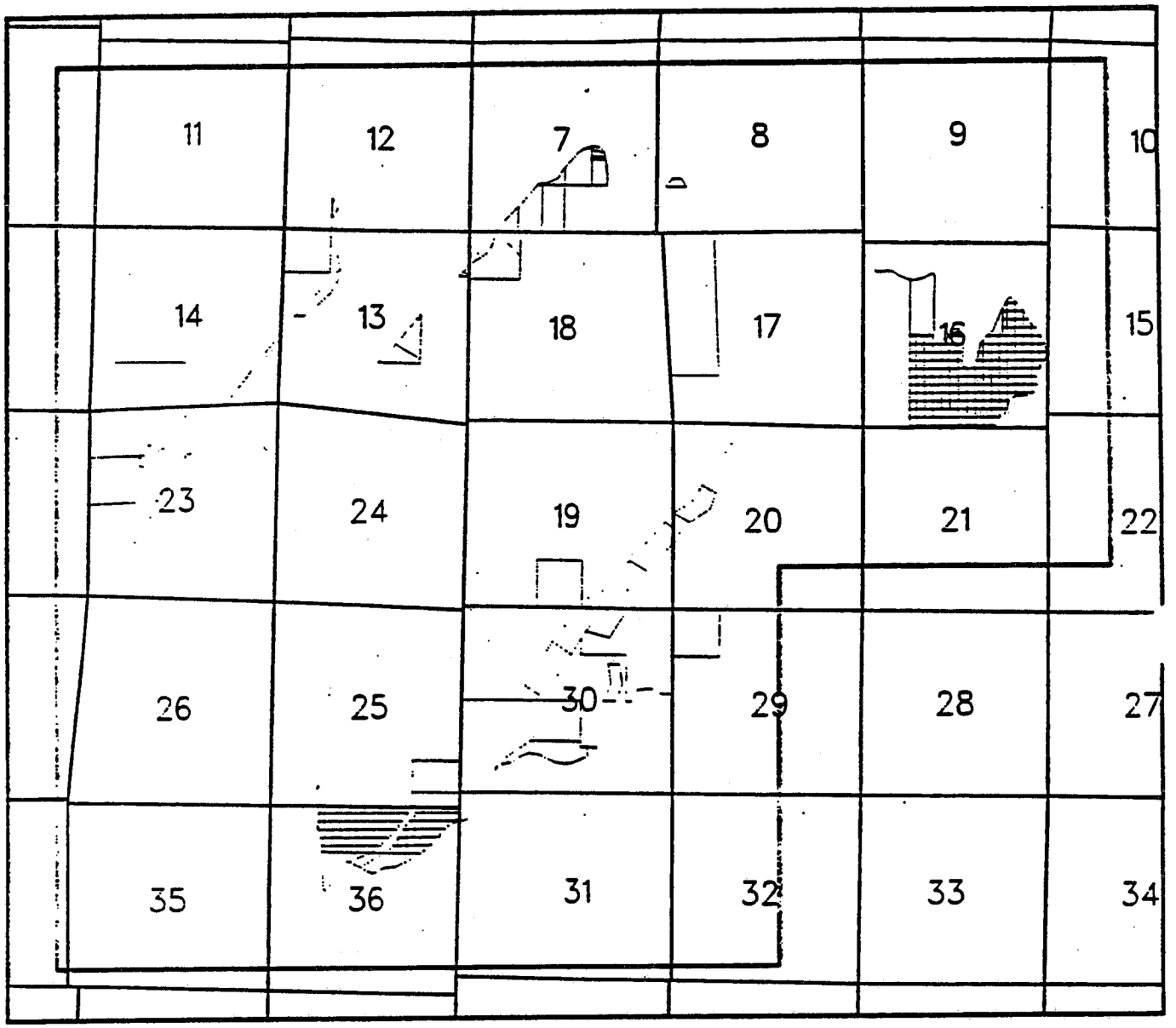


Figure 4.7. Harrisburg/Leeds/Babylon Take Area

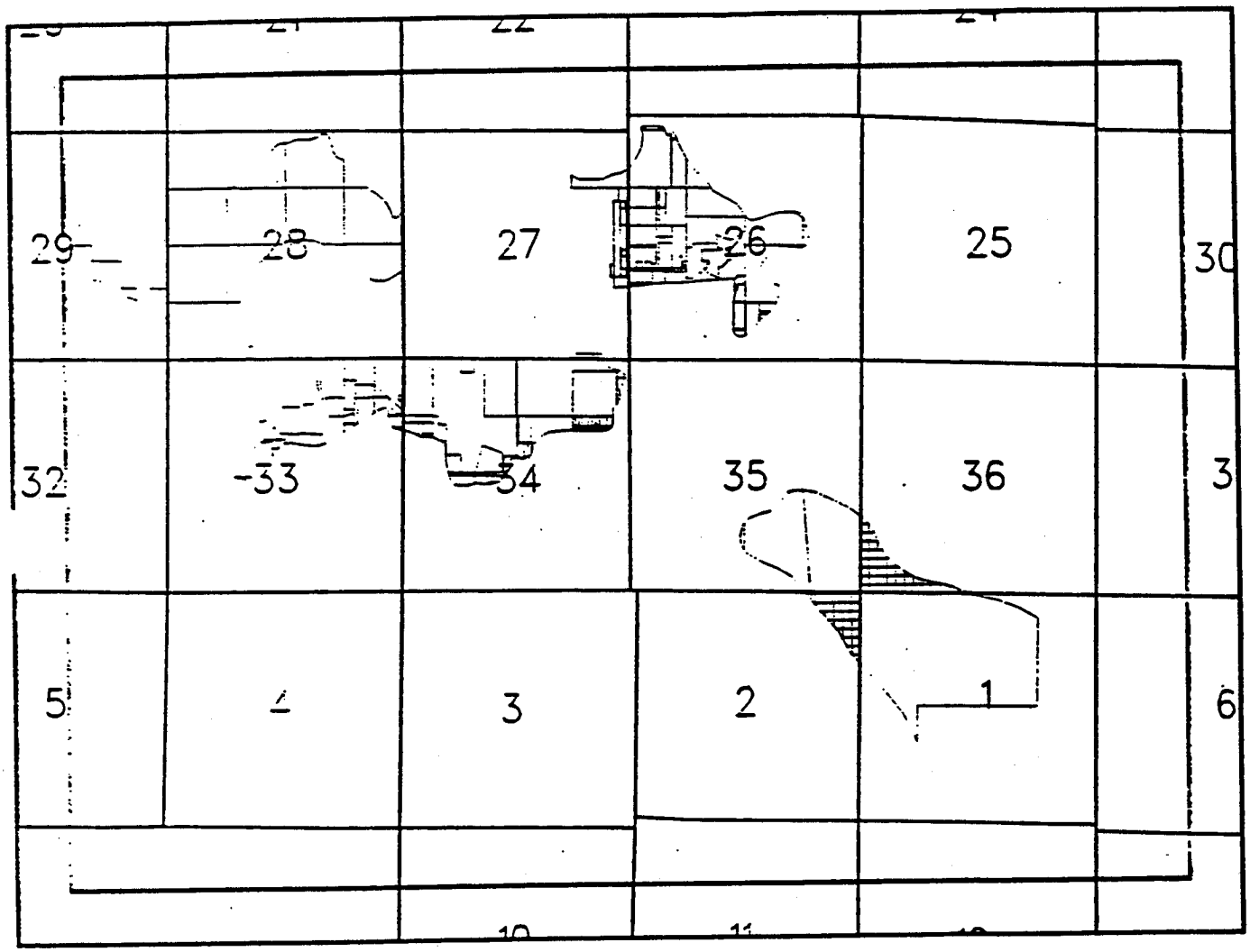


Figure 4.8. Hurricane Take Area

Table 4.9. Parcel Information for the Hurricane Take Areas

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	26	3301	STERLING D. & RANDI C. NELSON	16.12
T.41S.	R.13W.	26	BALLARD HEIGHTS .SUBDIVISION		4.66
T.41S.	R.13W.	26	GREEN ACRES NORTHVIE SUBDIVISION		2.93
T.41S.	R.13W.	26	H-3-1-26-31101	JAMES A. TESTA INC.	9.45
T.41S.	R.13W.	26	H-3-1-26-31401	JOSEPH R. & FRANCES T. RICE	7.84
T.41S.	R.13W.	26	H-3-1-26-4100	KENNETH R. ANDERSON	4.27
T.41S.	R.13W.	26	H-3-1-26-42001	JOSEPH R. & FRANCES T. RICE	7.89
T.41S.	R.13W.	26	H-3-1-26-4201	KENNETH R. ANDERSON	15.50
T.41S.	R.13W.	26	H-3-1-26-4202	KENNETH R. ANDERSON	8.86
T.41S.	R.13W.	26	H-3-1-26-4301	BEVERLY BARRICK	7.04
T.41S.	R.13W.	26	H-3-1-26-4302	W. WARD & ANTOINETTE D. HALL	1.41
T.41S.	R.13W.	26	H-3-1-26-4302	W. WARD & ANTOINETTE D. HALL	6.16
T.41S.	R.13W.	26	H-3-1-26-4303	EARL D. & L. LOUISE THOMAS	6.73
T.41S.	R.13W.	26	H-3-1-26-4304	FRED G. & RHEAN H. PENDLETON	9.51
T.41S.	R.13W.	26	H-3-1-26-4305	IRIS CROSBY TR	1.73
T.41S.	R.13W.	26	H-3-1-26-4306	PHILLIP M. & DEBRA R. JENSEN	0.93
T.41S.	R.13W.	26	H-3-1-26-4307	KENNETH R. ANDERSON	1.61
T.41S.	R.13W.	26	H-3-1-26-4400	KENNETH R. ANDERSON	0.98
T.41S.	R.13W.	26	H-3-1-26-4401	KENNETH R. ANDERSON	0.33
T.41S.	R.13W.	26	H-3-1-26-4402	KENNETH R. ANDERSON	7.68
T.41S.	R.13W.	26	H-3-1-26-4403	KENNETH R. ANDERSON	25.12
T.41S.	R.13W.	26	H-307-A-1	CITY OF HURRICANE	0.01
T.41S.	R.13W.	26	H-307-A-2	CITY OF HURRICANE	0.01
T.41S.	R.13W.	26	H-307-B	CITY OF HURRICANE	3.64
T.41S.	R.13W.	26	H-307-C	CITY OF HURRICANE, CEMETERY	0.81
T.41S.	R.13W.	26	H-311-A	AMERICAN LEGION S. RUSSELL POST 100	3.54
T.41S.	R.13W.	26	H-311-B-23	GEORGE AND GERALDINE OWEN	0.18
T.41S.	R.13W.	26	H-311-C-1-A	ROY AND IRIS ROACH	7.06
T.41S.	R.13W.	26	H-311-C-1-C	ROLAND AND THELMA HALL	6.02
T.41S.	R.13W.	26	H-311-C-1-D	GEORGE AND VIRGINIA GUBLER	0.23
T.41S.	R.13W.	26	H-311-C-1-E	LARON AND LINDA HALL	0.50
T.41S.	R.13W.	26	H-311-C-1-F	ROBERT AND YOVONDA HALL	0.50
T.41S.	R.13W.	26	H-311-C-2	GEORGE AND GERALDINE OWENS	0.21
T.41S.	R.13W.	26	H-311-C-3	CITY OF HURRICANE	0.03
T.41S.	R.13W.	26	H-311-C-5	KEVIN JONES	3.96
T.41S.	R.13W.	26	H-316-A-1-A	JAMES BALLARD	1.58
T.41S.	R.13W.	26	H-317-A-1-A-1	JAMES BALLARD	0.30
T.41S.	R.13W.	26	H-318-A-1	STERLING RUSSELL	0.71
T.41S.	R.13W.	26	H-318-A-3	KENNETH AND WANDA STEVENS	1.90
T.41S.	R.13W.	26	LV-166-A-SA	UTAH POWER AND LIGHT COMPANY	20.79
T.41S.	R.13W.	26	LV-166-B	GORDON AND DONNA WOOD	0.22
T.41S.	R.13W.	26	LV-42-A-2-1	WAYNE AND AMELIA WILSON	0.03
T.41S.	R.13W.	26	LV-42-A-3	STERLING AND RANDI NELSON	2.42
T.41S.	R.13W.	26	LV-45-B	GORDON AND DONNA WOOD	0.19
T.41S.	R.13W.	26	LV-45-C	GORDON AND DONNA WOOD	1.07
T.41S.	R.13W.	26	RIVER VIEW 2	SUBDIVISION	7.77
T.41S.	R.13W.	26	RIVER VIEW 3	SUBDIVISION	1.19
T.41S.	R.13W.	26	RIVER VIEW ESTATES SUBDIVISION		2.25
T.41S.	R.13W.	26	RIVER VIEW ESTATES SUBDIVISION		2.05

Table 4.9. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	26	ROW	HIGHWAY/ROAD ROW	2.56
T.41S.	R.13W.	26	ROW	HIGHWAY/ROAD ROW	2.02
T.41S.	R.13W.	26	ROW	HIGHWAY/ROAD ROW	0.13
T.41S.	R.13W.	26	ROW	HIGHWAY/ROAD ROW	0.21
T.41S.	R.13W.	26	ROW	HIGHWAY/ROAD ROW	0.58
T.41S.	R.13W.	27	H-3-1-27-1201	MART LYNN & JANICE SANDERS	6.18
T.41S.	R.13W.	27	H-3-1-27-1202	RICHARD M. & ROSEMARY S. LEE	0.46
T.41S.	R.13W.	27	H-3-1-27-1203	WILLIAM D. & EVELYN S. WRIGHT	1.92
T.41S.	R.13W.	27	H-3-1-27-1204	MACK W. & BARBARA P. SANDERS TR	0.52
T.41S.	R.13W.	27	H-3-1-27-1402	KENNETH ANDERSON	7.73
T.41S.	R.13W.	27	H-3-1-27-2100	CALVIN & MONA LOWE	5.27
T.41S.	R.13W.	27	H-3-1-27-2101	G. DENNIS AND MARGARET BEATTY	0.50
T.41S.	R.13W.	27	H-3-1-27-2102	MACK AND BARBARA SANDERS,TRS	1.12
T.41S.	R.13W.	27	H-3-1-27-2103	LARRY AND SUSAN HUTCHINGS	1.27
T.41S.	R.13W.	27	H-3-1-27-2104	MACK AND BARBARA SANDERS, TRS	0.52
T.41S.	R.13W.	27	H-3-1-27-2202	CALVIN AND MONA LOWE	1.19
T.41S.	R.13W.	27	MUNICIPAL	MUNICIPAL	0.06
T.41S.	R.13W.	27	ROW	HIGHWAY/ROAD ROW	0.56
T.41S.	R.13W.	28	H-3-1-28-1201	AR SPILSBURY F.E.	32.26
T.41S.	R.13W.	28	H-3-1-28-1301	AR SPILSBURY F.E.	37.26
T.41S.	R.13W.	28	H-3-1-28-1401	AR SPILSBURY F.E.	31.02
T.41S.	R.13W.	28	H-3-1-28-2101	AR SPILSBURY F.E.	19.26
T.41S.	R.13W.	28	H-3-1-28-3101	AR SPILSBURY F.E.	17.13
T.41S.	R.13W.	28	H-3-1-28-3201	AR SPILSBURY F.E.	14.76
T.41S.	R.13W.	28	H-3-1-28-3301	AR SPILSBURY F.E.	36.64
T.41S.	R.13W.	28	H-3-1-28-3401	AR SPILSBURY F.E.	39.77
T.41S.	R.13W.	28	H-3-1-28-4101	AR SPILSBURY F.E.	14.43
T.41S.	R.13W.	28	H-3-1-28-4201	AR SPILSBURY F.E.	38.89
T.41S.	R.13W.	28	H-3-1-28-4301	AR SPILSBURY F.E.	39.20
T.41S.	R.13W.	29	H-3-1-29-211-DC-RD	CITY OF HURRICANE	14.95
T.41S.	R.13W.	29	H-3-1-29-211-DC-RD	CITY OF HURRICANE	4.79
T.41S.	R.13W.	33	COTTONWOOD ESTATES SUBDIVISION		7.99
T.41S.	R.13W.	33	H-3-1-33-1110	THOMAS AND CAROL COLEMERE	13.61
T.41S.	R.13W.	33	H-3-1-33-1111-SA	UTAH POWER AND LIGHT CO.	0.26
T.41S.	R.13W.	33	H-3-1-33-1121	GEORGE AND IRENE SHAMO	0.96
T.41S.	R.13W.	33	H-3-1-33-1121	GEORGE AND IRENE SHAMO	1.22
T.41S.	R.13W.	33	H-3-1-33-1130	RAYMOND DEE AND CHERYL ADAMS	0.59
T.41S.	R.13W.	33	H-3-1-33-11401	KENNETH ANDERSON	3.75
T.41S.	R.13W.	33	H-3-1-33-1142	GARY AND JANET BRATTON, TRS	5.58
T.41S.	R.13W.	33	H-3-1-33-1143	GARY AND JANET BRATTON, TRS	2.79
T.41S.	R.13W.	33	H-3-1-33-1210	GEORGE HARRY SHAMO	1.78
T.41S.	R.13W.	33	H-3-1-33-1211	GEORGE AND HELENE EDWARDS	0.18
T.41S.	R.13W.	33	H-3-1-33-1230	GEORGE HARRY SHAMO	2.93
T.41S.	R.13W.	33	H-3-1-33-12310	LOA MECHAM	3.92
T.41S.	R.13W.	33	H-3-1-33-1240	LOA MEACHAM	1.02
T.41S.	R.13W.	33	H-3-1-33-1244	LOA MECHAM	0.59
T.41S.	R.13W.	33	H-3-1-33-1320	DARWIN AND LARENE SLACK	5.58
T.41S.	R.13W.	33	H-3-1-33-1443	EULA YORK	2.94
T.41S.	R.13W.	33	H-3-1-33-2446	KENNETH ANDERSON	51.31

Table 4.9. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	33	H-3-1-33-2446	KENNETH ANDERSON	10.09
T.41S.	R.13W.	33	H-3-1-33-3141	CARLON & VERNA HINTON TRUSTEES	6.24
T.41S.	R.13W.	33	H-3-1-33-3142	CARLON AND VERNA HINTON, TRS	0.28
T.41S.	R.13W.	33	H-3-1-33-4221	CARLON AND VERNA HINTON	1.96
T.41S.	R.13W.	33	H-3-1-33-4223	HUGH AND CARMA RICHENS, TR	0.27
T.41S.	R.13W.	33	H-3-1-33-4224	HUGH AND CARMA RICHENS, TR	0.74
T.41S.	R.13W.	33	H-3-1-33-4225	GERRY G AND JO LIN ZOBRIST	0.44
T.41S.	R.13W.	33	H-3-1-33-44001	EARL AND LUCILE MURIE, TR	50.21
T.41S.	R.13W.	33	H-3-1-33-4440	VERNON DICKMAN	0.01
T.41S.	R.13W.	33	HURRICANE GARDEN 1 SUBDIVISION		21.81
T.41S.	R.13W.	33	MUNICIPAL	MUNICIPAL	0.30
T.41S.	R.13W.	33	MUNICIPAL	MUNICIPAL	0.28
T.41S.	R.13W.	33	ROW	HIGHWAY/ROAD ROW	1.01
T.41S.	R.13W.	33	ROW	HIGHWAY/ROAD ROW	0.13
T.41S.	R.13W.	34	H-3-1-34-1111	HALL RENTAL AND DEVELOPMENT INC.	0.57
T.41S.	R.13W.	34	H-3-1-34-11121	WASHINGTON COUNTY BOARD OF EDUCATION	23.29
T.41S.	R.13W.	34	H-3-1-34-11121	WASHINGTON COUNTY BOARD OF EDUCATION	0.04
T.41S.	R.13W.	34	H-3-1-34-1400	CALVIN AND MONA LOWE	44.24
T.41S.	R.13W.	34	H-3-1-34-3110	MARY HALL	0.05
T.41S.	R.13W.	34	H-3-1-34-3110	MARY HALL	0.05
T.41S.	R.13W.	34	H-3-1-34-3116	CARLON AND VERNA HINTON	0.06
T.41S.	R.13W.	34	H-3-1-34-3117	GORDON H. JR AND ARLENE CAMPBELL	0.30
T.41S.	R.13W.	34	H-3-1-34-3118	CLAIR HALL	0.36
T.41S.	R.13W.	34	H-3-1-34-3119	CLAYTON AND BARBARA STRATTON	0.33
T.41S.	R.13W.	34	H-3-1-34-3121	ABRAHAM AND JANET BURCIAGA	0.03
T.41S.	R.13W.	34	H-3-1-34-31401	CONRAD H. CAMPOS, TR	1.35
T.41S.	R.13W.	34	H-3-1-34-3410	WILLIAM AND NINA STRATTON, TRS	2.70
T.41S.	R.13W.	34	H-3-1-34-410	EMMA H. AND LYNDON BRADSHAW	22.58
T.41S.	R.13W.	34	H-3-1-34-4100	MILTON AND HELEN HALL	2.25
T.41S.	R.13W.	34	H-3-1-34-4111	HURRICANE CANAL CO	0.87
T.41S.	R.13W.	34	H-3-1-34-4200	BOYD CLARENCE AND DORIS HALL	70.69
T.41S.	R.13W.	34	H-3-1-34-4220	RONN MUNFORD	1.17
T.41S.	R.13W.	34	H-3-1-34-4230	STERLING AND RANDI NELSON	6.80
T.41S.	R.13W.	34	H-3-1-34-4315	LAWRENCE AND GERALDENE BAILEY	2.97
T.41S.	R.13W.	34	H-3-1-34-4316	STEVEN AND DOLORES SCOTT	0.16
T.41S.	R.13W.	34	H-3-1-34-4320	ELWIN DAVID AND RUTH DEMILLE, TRS	2.98
T.41S.	R.13W.	34	H-3-1-34-43401	LAWRENCE AND GERALDENE BAILEY	1.72
T.41S.	R.13W.	34	H-3-1-34-4341	INTERTROPIC INVESTORS INC.	2.36
T.41S.	R.13W.	34	H-3-1-34-4345	EDGAR C. JR. AND ETHELYN PETERSON	0.73
T.41S.	R.13W.	34	H-3-1-34-4346	LAWRENCE AND GERALDENE BAILEY	0.36
T.41S.	R.13W.	34	H-3-1-34-4347	EUGENE AND KRISTINE HUGHES, TRS	1.41
T.41S.	R.13W.	34	H-3-1-34-4400	STERLING AND RANDI NELSON	19.85
T.41S.	R.13W.	34	H-322	ALINE LAFORGE	0.65
T.41S.	R.13W.	34	H-324	RUTH RAGOZZINE	0.61
T.41S.	R.13W.	34	H-325	JOSEPH AND GEORGIA HOUSTON, TRS	1.28
T.41S.	R.13W.	34	H-326-A-1-N	SCHOLZEN INVESTMENT COMPANY	9.19
T.41S.	R.13W.	34	H-326-A-3	DANIEL IRVIN AND LAVON BARNEY, TRS	4.13
T.41S.	R.13W.	34	H-327-B	WILLIAM AND MARIDON CROSBY	0.15

Table 4.9. (Continued)

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.13W.	34	H-328-B	ROSE FRAZIER, TR	0.65
T.41S.	R.13W.	34	H-334-10	LDS CORPORATION OF PRES. OF CHURCH	0.44
T.41S.	R.13W.	34	H-334-11	WARD STRATTON, ET UX	0.09
T.41S.	R.13W.	34	H-334-12-A	JOHN WILLY & PEGGY JOAN ANDERSON, TRS	0.09
T.41S.	R.13W.	34	H-334-12-C	EARL H. AND LORRAINE WOOD	0.12
T.41S.	R.13W.	34	H-334-13	EDWARD LAKE, ET UX	0.12
T.41S.	R.13W.	34	H-334-14	CLINTON ISOM, ET UX	0.11
T.41S.	R.13W.	34	H-334-15	WILLIAM AND HELEN ISOM	0.13
T.41S.	R.13W.	34	H-334-16	DALMAR AND VERONICA ANGELL	0.13
T.41S.	R.13W.	34	H-334-17	DONALD LEE AND KLEA BEATTY	0.32
T.41S.	R.13W.	34	H-334-2	W.B. AND RUBY BANDLEY, TRS	0.40
T.41S.	R.13W.	34	H-334-3	WARD STRATTON AND LAUREL PRINCE	0.35
T.41S.	R.13W.	34	H-334-4	ROBERT AND BEVERLY HERRICK	0.40
T.41S.	R.13W.	34	H-334-5	LUNT MOTOR COMPANY	0.35
T.41S.	R.13W.	34	H-334-6	WASHINGTON COUNTY BOARD OF EDUCATION	0.42
T.41S.	R.13W.	34	H-334-7	FRANCE AND DOROTHY SPENDLOVE	0.42
T.41S.	R.13W.	34	H-334-8-A	DONALD LEE AND KLEA BEATTY	0.17
T.41S.	R.13W.	34	H-334-8-B-1	DONALD LEE AND KLEA BEATTY	0.31
T.41S.	R.13W.	34	H-334-9	DONALD LEE AND KLEA BEATTY	0.42
T.41S.	R.13W.	34	H-335-A	DONALD LEE AND KLEA BEATTY	0.34
T.41S.	R.13W.	34	H-335-B	EDWARD BOWLER	0.07
T.41S.	R.13W.	34	H-337	ANDREW AND ELLENE HYER	0.11
T.41S.	R.13W.	34	H-338-A-1-A	PHIL AND JUDY OLSEN	0.09
T.41S.	R.13W.	34	H-338-A-2	B.C. AND MARGARET CHAUDHURI	0.00
T.41S.	R.13W.	34	H-347-A-1	WASHINGTON COUNTY BOARD OF EDUCATION	0.09
T.41S.	R.13W.	34	H-347-B-2	DEAN WARRICK	0.00
T.41S.	R.13W.	34	H-375-A	HALL RENTAL AND DEVELOPMENT INC.	1.18
T.41S.	R.13W.	34	MUNICIPAL	MUNICIPAL	0.48
T.41S.	R.13W.	34	ROW	HIGHWAY/ROAD ROW	2.14
T.41S.	R.13W.	34	ROW	HIGHWAY/ROAD ROW	0.27
T.41S.	R.13W.	34	ROW	HIGHWAY/ROAD ROW	0.91
T.41S.	R.13W.	35	H-351-A-N	ELWIN DAVID AND RUTH DEMILLE, TRS	48.35
T.41S.	R.13W.	35	H-352-N	WAYNE KENT WILSON	57.81
T.41S.	R.13W.	35	NONE-01	HURRICANE CANAL CO.	0.79
T.41S.	R.13W.	36	STATE	STATE OF UTAH	31.34
T.42S	R.13W.	01	3313-A-NP	DELL STANWORTH TRELAL	223.43
T.42S	R.13W.	02	STATE	STATE OF UTAH	22.50

4.3.8 Springdale Take Area

Desert tortoises are known to occur in the Springdale area immediately adjacent to Zion National Park in an area of approximately 159 acres of private land. This take area is presented in Figure 4.9. and land ownership and legal information are presented in Table 4.10. It is suspected that desert tortoises here were introduced and were not native to the area. This small parcel has been designated a take area due to its proximity to urban development and its isolation from the main desert tortoise population in the County.

Table 4.10. Parcel Information for Springdale Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.10W.	29	ROW	HIGHWAY/ROAD ROW	1.96
T.41S.	R.10W.	29	S-128-A-NP	UTAH BOARD OF EDUCATION	54.98
T.41S.	R.10W.	29	S-128-B-NP	TOWN OF SPRINGDALE	11.67
T.41S.	R.10W.	29	S-13-B	OSCAR AND FRANCES JOHNSON	0.73
T.41S.	R.10W.	29	S-13-C	J & J AUTOMOTIVE ENTERPRISES	0.23
T.41S.	R.10W.	29	S-13-D	OSCAR AND DENNIS JOHNSON	0.76
T.41S.	R.10W.	29	S-14-A	PATRICIA MOORE	0.51
T.41S.	R.10W.	29	S-14-B-1	JANICE LEE PARKER	<0.01
T.41S.	R.10W.	29	S-160-A-1	GALE AND BARBARA GIFFORD, TRS	23.18
T.41S.	R.10W.	29	S-160-A-2-SA	UTAH POWER AND LIGHT COMPANY	0.05
T.41S.	R.10W.	29	S-160-A-3	HELEN WINDER	0.28
T.41S.	R.10W.	29	S-160-B	TOWN OF SPRINGDALE	1.14
T.41S.	R.10W.	29	S-160-NP	TOWN OF SPRINGDALE	36.94
T.41S.	R.10W.	29	S-21-A-SA	MOUNTAIN STATES TELEGRAPH & TELEPHONE	0.19
T.41S.	R.10W.	29	S-21-B	ROBERT AND VIOLET RALSTON	2.09
T.41S.	R.10W.	29	S-21-C	ROBERT AND VIOLET RALSTON	0.34
T.41S.	R.10W.	29	S-21-D	RICHARD AND MICHELLE O'TOOLE	0.11
T.41S.	R.10W.	29	S-22	RICHARD AND MICHELLE O'TOOLE	0.14
T.41S.	R.10W.	29	S-23-A-1	ALFRED AND MARY BENNETT	0.11
T.41S.	R.10W.	29	S-23-A-2	JOHN AND MARLENE FARRAND	0.72
T.41S.	R.10W.	29	S-23-B	DALE AND KATHLEEN WILKERSON	0.06
T.41S.	R.10W.	29	S-26-A	DALE & KATHLEEN WILKERSON	0.47
T.41S.	R.10W.	29	S-29-B	RICHARD AND JACQUE BELL	0.20
T.41S.	R.10W.	29	S-30-A	ROBERT MCMAHON	0.50
T.41S.	R.10W.	29	S-30-D	ROBERT JOHN MCMAHON	0.46
T.41S.	R.10W.	29	S-31-B	EULA BRUCE, TR	0.53
T.41S.	R.10W.	29	S-32-A	JULIUS AND MAVIS MADSEN	0.32
T.41S.	R.10W.	29	S-32-B	EDWIN AND ZETTA PETERSON	0.30
T.41S.	R.10W.	29	S-35	LANCE AND KIRK GIFFORD	0.02
T.41S.	R.10W.	29	S-42-A-1	STEPHEN AND ROSALIND ROTH	0.01
T.41S.	R.10W.	29	S-42-B	DEWITT JONES III	0.27
T.41S.	R.10W.	29	S-44	GERALD AND HELEN PLAYER, TRS	0.56
T.41S.	R.10W.	29	S-45	FRANK AND CAROL ZMUDA	0.37
T.41S.	R.10W.	29	S-46	FRANK, CAROL & MONTY ZMUDA	1.51
T.41S.	R.10W.	29	S-47-A	NORENE AND MINOR YEAGLEY	0.20
T.41S.	R.10W.	29	S-48	DEWITT JONES III	0.38
T.41S.	R.10W.	29	S-49	CRAIG CROCKETT	0.19

Table 4.10. (Continued)

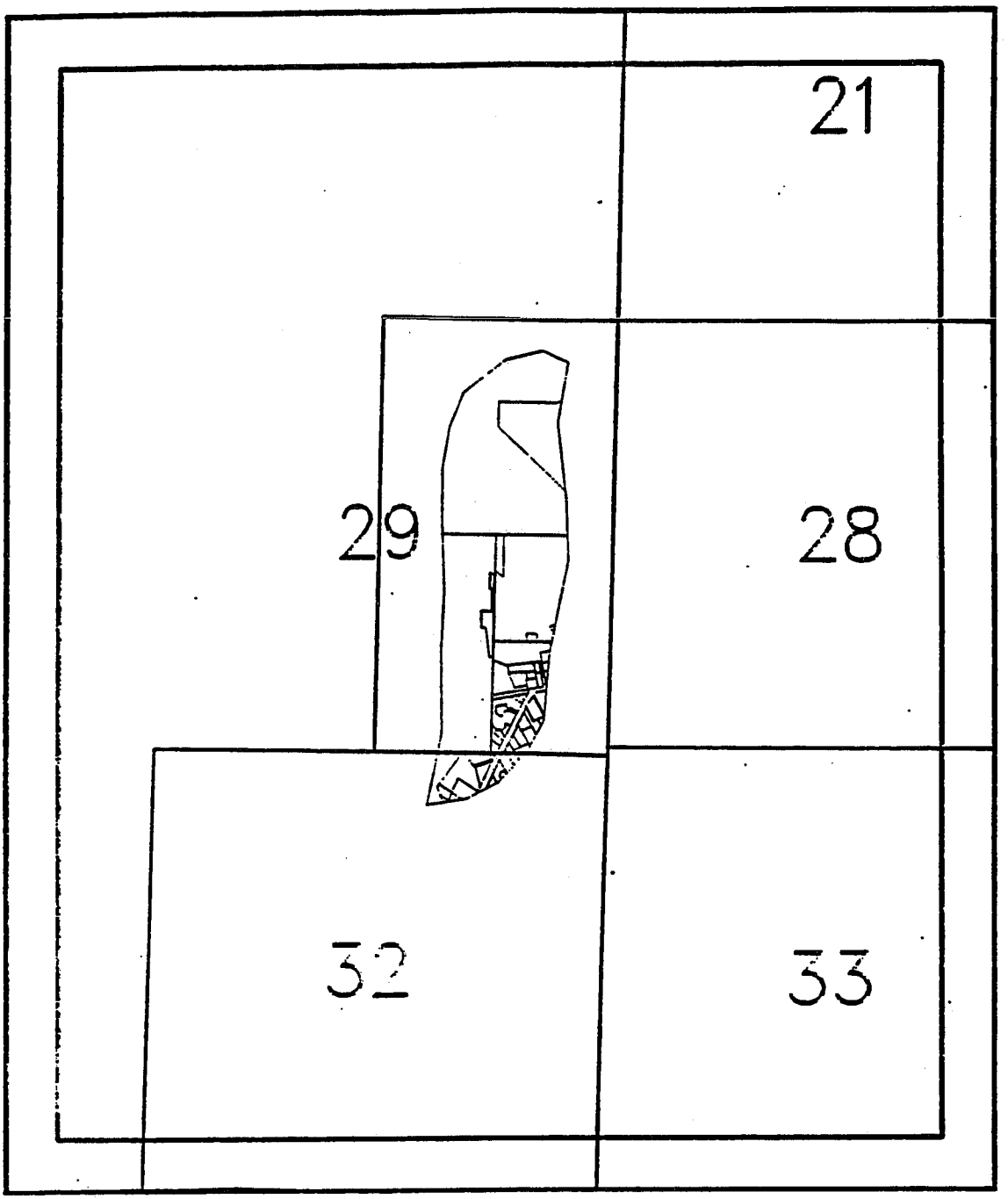
Township	Range	Section	Parcel #	Owner	Acres
T.41S.	R.10W.	29	S-53	GRACE TANNER FIRM	0.29
T.41S.	R.10W.	29	S-54	J & J AUTOMOTIVE ENTERPRISES	0.35
T.41S.	R.10W.	29	S-55	JOHN AND WINIFRED LEES	0.28
T.41S.	R.10W.	29	S-56	JERALD AND LAWANA HATCH	0.20
T.41S.	R.10W.	29	S-57-A	DAVID AND TOVY FERBER	0.13
T.41S.	R.10W.	29	S-58-B	ELMER L. HIGLEY & DELLA CRAWFORD,TR	0.17
T.41S.	R.10W.	29	S-60	WASHINGTON CO. BOARD OF EDUCATION	0.01
T.41S.	R.10W.	29	WINDERLAND 1-A	SUBDIVISION	3.88
T.41S.	R.10W.	32	ROW	HIGHWAY/ROAD ROW	0.89
T.41S.	R.10W.	32	S-161-A-1-A	OTHELL GIFFORD	2.52
T.41S.	R.10W.	32	S-169	DENNIS AND PEARL ANN JOHNSON	0.11
T.41S.	R.10W.	32	S-29-B	RICHARD AND JACQUE BELL	0.27
T.41S.	R.10W.	32	S-32-A	JULIUS AND MAVIS MADSEN	0.12
T.41S.	R.10W.	32	S-35	LANCE AND KIRK GIFFORD	0.53
T.41S.	R.10W.	32	S-38	ZION PARK RESORT LTD. PARTNERSHIP	0.19
T.41S.	R.10W.	32	S-40-A	ZION PARK RESORT LTD. PARTNERSHIP	0.47
T.41S.	R.10W.	32	S-40-B	TOWN OF SPRINGDALE	0.11
T.41S.	R.10W.	32	S-42-A-1	STEPHEN AND ROSALIND ROTH	0.06
T.41S.	R.10W.	32	S-42-B	DEWITT JONES III	0.02
T.41S.	R.10W.	32	S-87	ZION PARK RESORT LTD. PARTNERSHIP	0.58
T.41S.	R.10W.	32	S-89-A-1	PATSY WARNER	2.75
T.41S.	R.10W.	32	S-89-A-2	STEVEN SANDSTROM	0.41
T.41S.	R.10W.	32	S-89-A-4	BIT AND SPUR ASSOCIATES INC.	0.21
T.41S.	R.10W.	32	S-89-A-5	HARRIET BLAS	1.04
T.41S.	R.10W.	32	S-89-B	BIT AND SPUR ASSOCIATES INC.	0.09
T.41S.	R.10W.	32	S-90	STEPHEN AND ROSALIND ROTH	0.77

4.3.9 Bloomington Hill Take Area

The Bloomington Hill take area is presented in Figure 4.10, and land ownership information is presented in Table 4.11. It consists of approximately 106 acres of State School Trust lands southwest of St. George. It is designated for incidental take due to its isolation.

Table 4.11. Parcel Information for Bloomington Hill Take Area.

Township	Range	Section	Parcel #	Owner	Acres
T.43S.	R.16W.	10	STATE	STATE OF UTAH	105.26



Private

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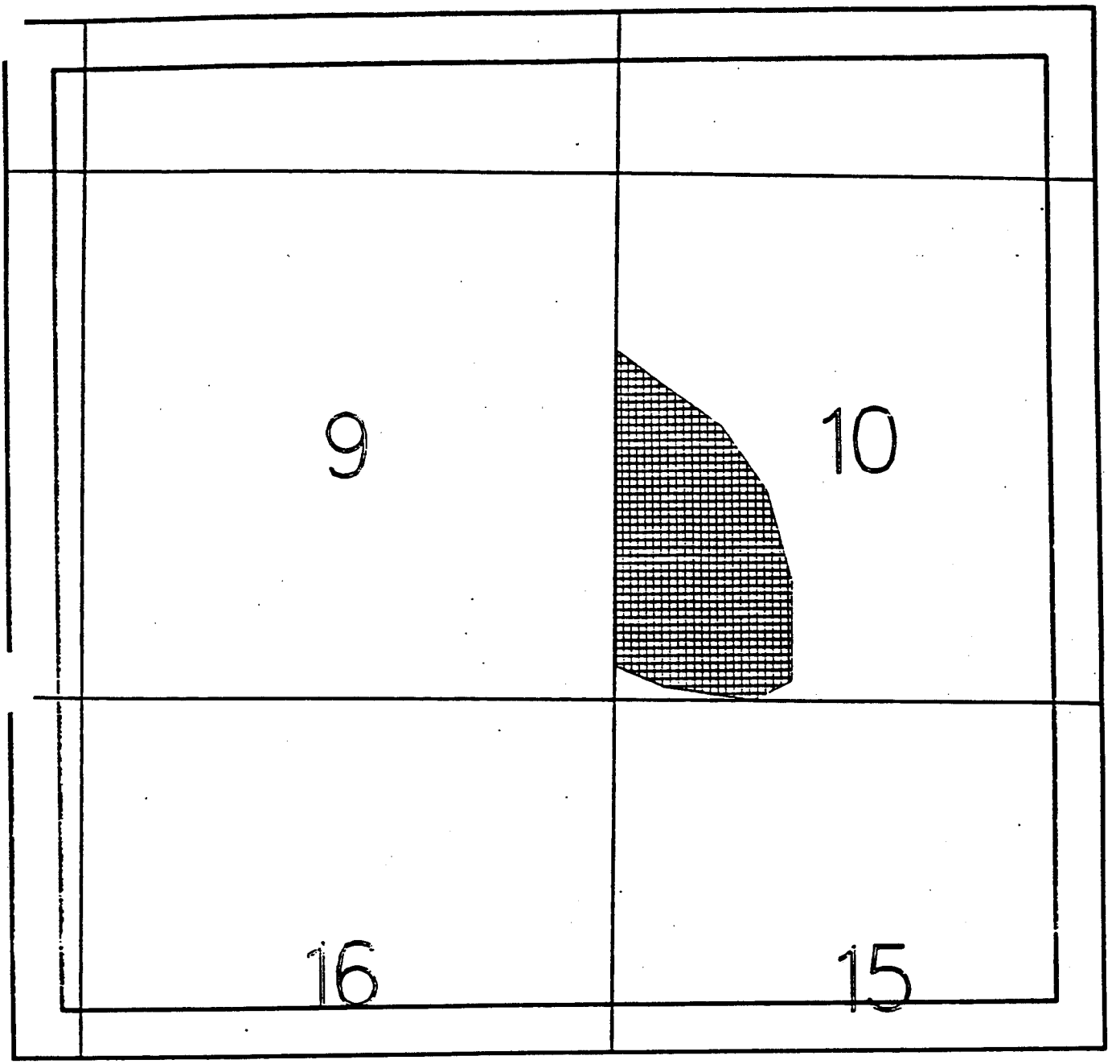
Figure 4.9. Springdale Take Area



State of Utah

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Figure 4.10. Bloomington Hill Take Area

4.3.10 South Hurricane Cliffs Take Area

The South Hurricane Cliffs take area is presented in Figure 4.11, and land ownership information is presented in Table 4.12. It consists of approximately 87 acres of State School Trust lands southeast of St. George. It is designated for incidental take due to its isolation.

Table 4.12. Parcel Information for South Hurricane Cliffs Area.

Township	Range	Section	Parcel #	Owner	Acres
T.43S.	R.13W.	16	STATE	STATE OF UTAH	86.83

4.4 SUBDIVISION POLICY

There are numerous subdivisions within the designated take areas. These subdivisions are in various phases of development. Once the Section 10(a)(1)(B) permit is issued, the HCP biologist will conduct field reconnaissance of all subdivisions to determine habitat suitability. This will be done prior to notifying all landowners of the permit requirements in the incidental take areas. For those subdivisions which do not contain desert tortoise habitat, they will be brought to the attention of the HCAC for potential removal from designated habitat. For subdivisions which are in desert tortoise habitat, name and addresses of affected lot owners will be obtained and landowners notified of the permit requirements.

4.5 POTENTIAL HABITAT AREAS

Current USFWS desert tortoise survey protocol requires desert tortoise surveys in all areas of Washington County below 4,000 feet in elevation. For this HCP, extensive surveys were conducted throughout Washington County in order to identify all portions of the County which may be Mojave desert tortoise habitat. However, due to the large size of the County and the inability for the HCP to afford 100 percent survey coverage, it is possible that population pockets or individuals may reside in areas that have not been designated as desert tortoise habitat on the maps created for this HCP. The County, based on the advice of its TAC Committee, has designated potential habitat areas (see Figure 4.12) in which desert tortoises may exist by virtue of the habitat characteristics but which are thought not to have desert tortoises.

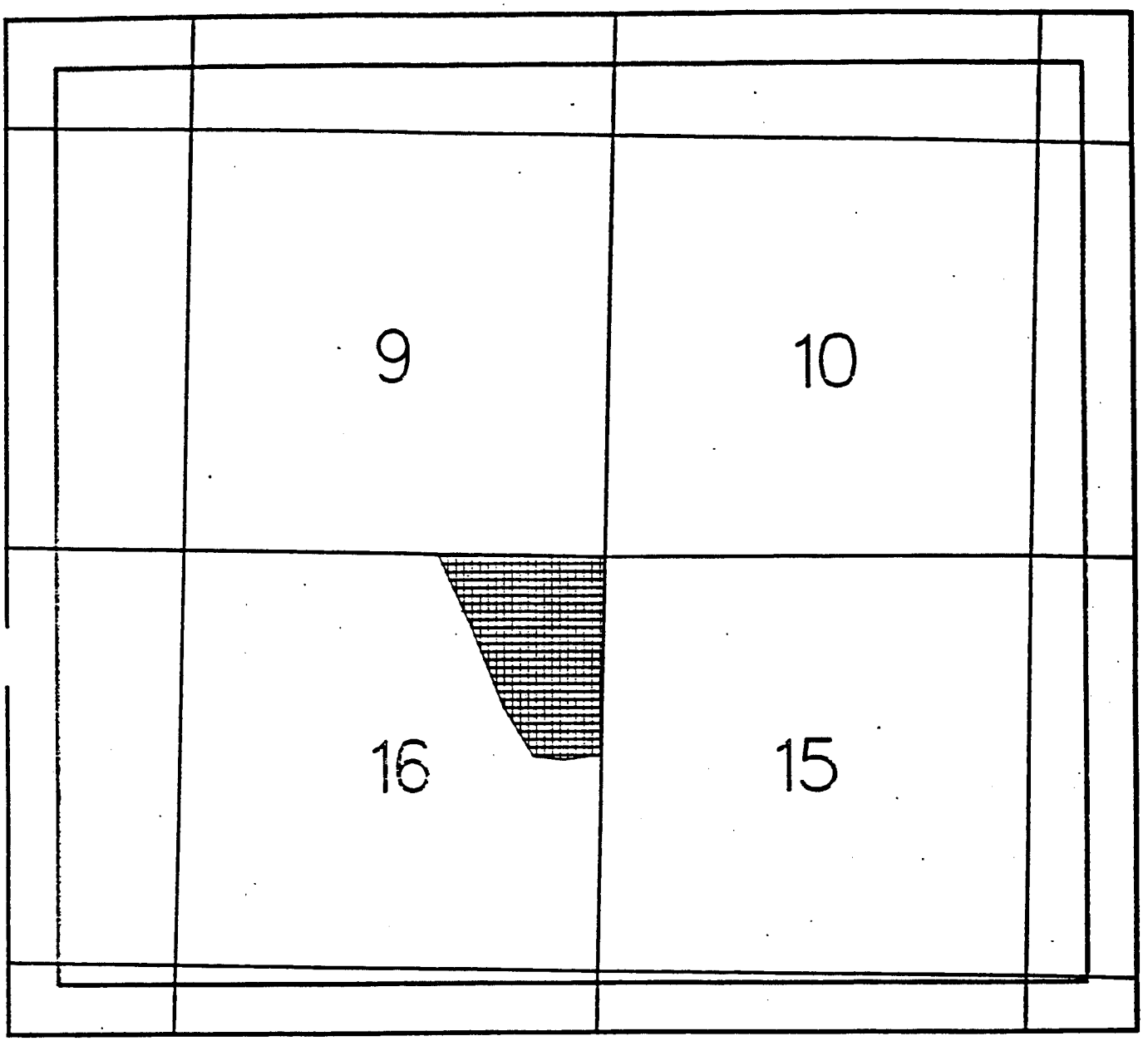


Figure 4.11. South Hurricane Cliffs Take Area

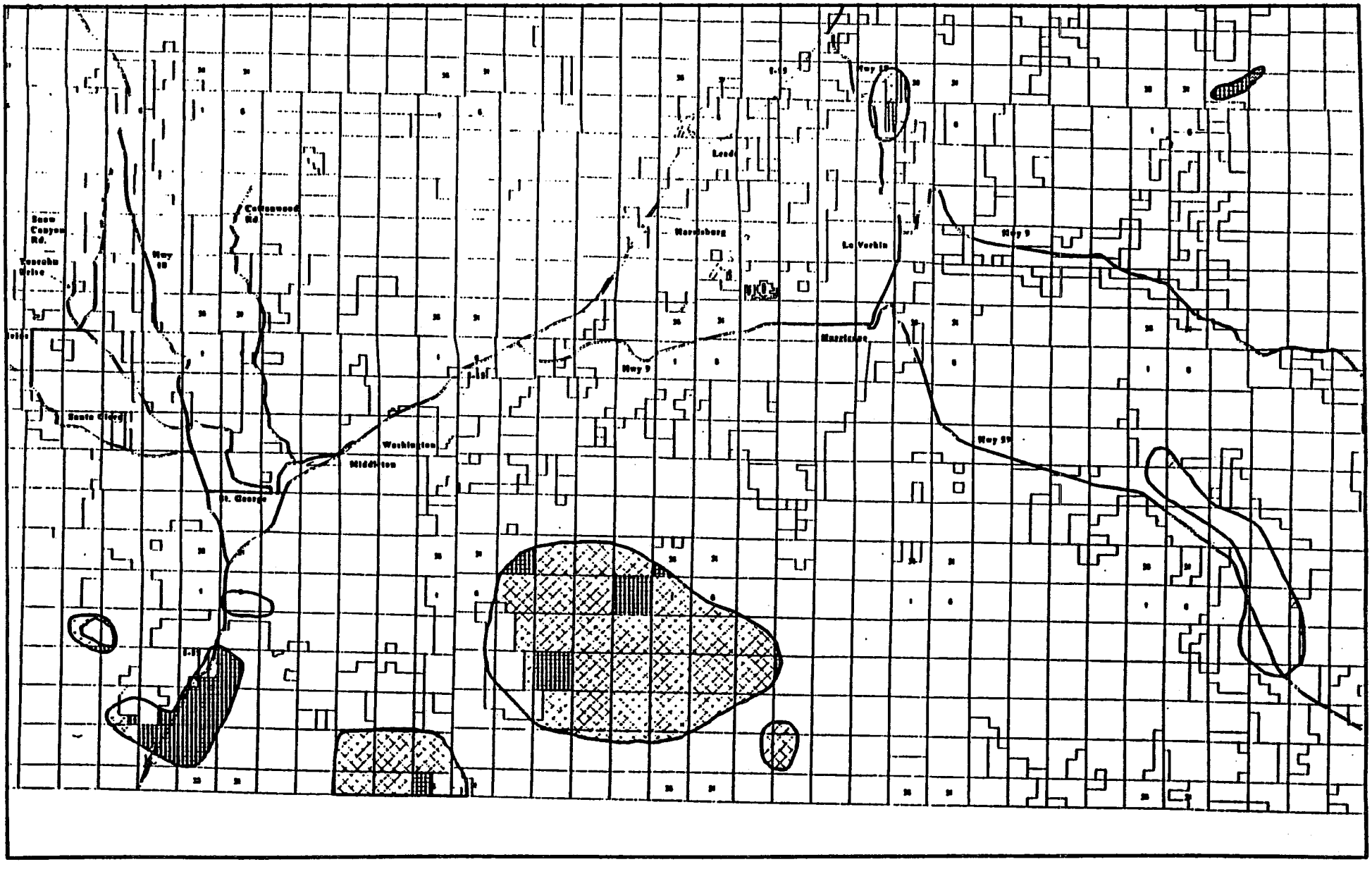


Figure 4.. Potential Habitat Areas

Areas of potential habitat and their associated boundaries are identified in Figure 4.12. It is possible that isolated desert tortoises could be found inside and outside these potential areas and elsewhere in the County. The USFWS has accordingly recognized that the County's take permit is county-wide outside of the proposed reserve except such areas included in cities that have not signed the HCP/Impact Fee Ordinance. The amount of potential habitat area included in this category is 31,282 acres, of which 4,803 acres are State School Trust lands, 19,380 are BLM lands, 7,029 acres are private lands, and 70 acres are in Zion National Park. Many of these areas are not likely to be developed. Landowners wishing to develop or change the use of lands in these areas will have to consult with the HCP administrator, who shall determine if further survey and removal is necessary. However, if desert tortoises are present, and they need to be removed, these potential habitat areas will not count against incremental take acreage, but the removed animals will count against the incidental take total of the permit. A list of landowners and addresses has not been completed at this time.

CHAPTER 5.0
MEASURES TO MINIMIZE AND MITIGATE INCIDENTAL TAKE

5.1 INTRODUCTION

This chapter details measures to minimize and mitigate the incidental take proposed in this HCP. Methods to minimize incidental take include fencing, law enforcement, education, and translocation. Methods to mitigate incidental take include acquisition, management, and monitoring of a tortoise reserve, and acquisition of grazing permits. Monitoring of incidental take is discussed in Chapter 6.

5.2 MINIMIZE INCIDENTAL TAKE

Incidental take has been minimized through the design of the largest reserve practicable for the Mojave desert tortoise, thus minimizing the amount of incidental take. Other methods to minimize incidental take include fencing, law enforcement, education, and translocation.

5.2.1 Fencing

The primary objective of fencing boundaries of the reserve is to reduce desert tortoise mortality, which can result from adverse human impacts, diseased desert tortoises from outside of the reserve infecting desert tortoises within the reserve, and desert tortoises leaving the reserve and being killed. Adverse human impacts that can be reduced or eliminated by fencing include indiscriminate garbage dumping, the establishment of additional unimproved roadways, damage caused by OHV use, and predation by dogs. Fencing also mitigates take by allowing impacted areas to revegetate and heal naturally, thus enhancing desert tortoise habitat.

Fencing, an important component of the mitigation program, is estimated to cost $2,000,000. Of this total, it is estimated that the portion of the fencing program attributable to the HCP is $500,000, with the remainder attributable to developers adjacent to the reserve and the Utah Department of Transportation/Federal Highway Administration, and possibly to the Five County Association of Governments through grant acquisition. The fencing plan is presented in Figure 5.1 and consists of constructing approximately 70 miles of three types of fence along roadways, reserve boundaries, and plant reserves. The final design of each of these three fence types will be reviewed by the HCAC and approved by the Washington County Commission. Fence construction will be reported by the HCP administrator in quarterly and annual reports, as detailed in Chapter 6.

The first fence type is a barrier which keeps human activities and pets out and keeps desert tortoises in. Approximately 26.2 miles of this type will be installed in the following areas where geographic features are not adequate barriers:

- Ivins through Padre Canyon to Snow Canyon Road, on the southern reserve line.
- Paradise Canyon: both northern and southern reserve lines.

- Winchester Hills: southern and eastern portions, where cliffs would not prevent incursion into the reserve from the west by humans and pets.
- Middleton to the North Washington reserve line.
- North Washington reserve line.
- Eastern boundary at property line west of Red Cliffs Road.

The second fence type would be a desert tortoise-proof fence, which would be constructed along 18.9 miles in the following areas, again in areas where geographic features are not adequate:

- Reserve Boundary from Snow Canyon Road to Paradise Canyon.
- Skyline Drive (both sides).
- Utah Highway 18 (both sides).
- West side of Interstate 15.

The third fence type would be a range fence to protect endangered plant areas, totaling 26.1 miles.

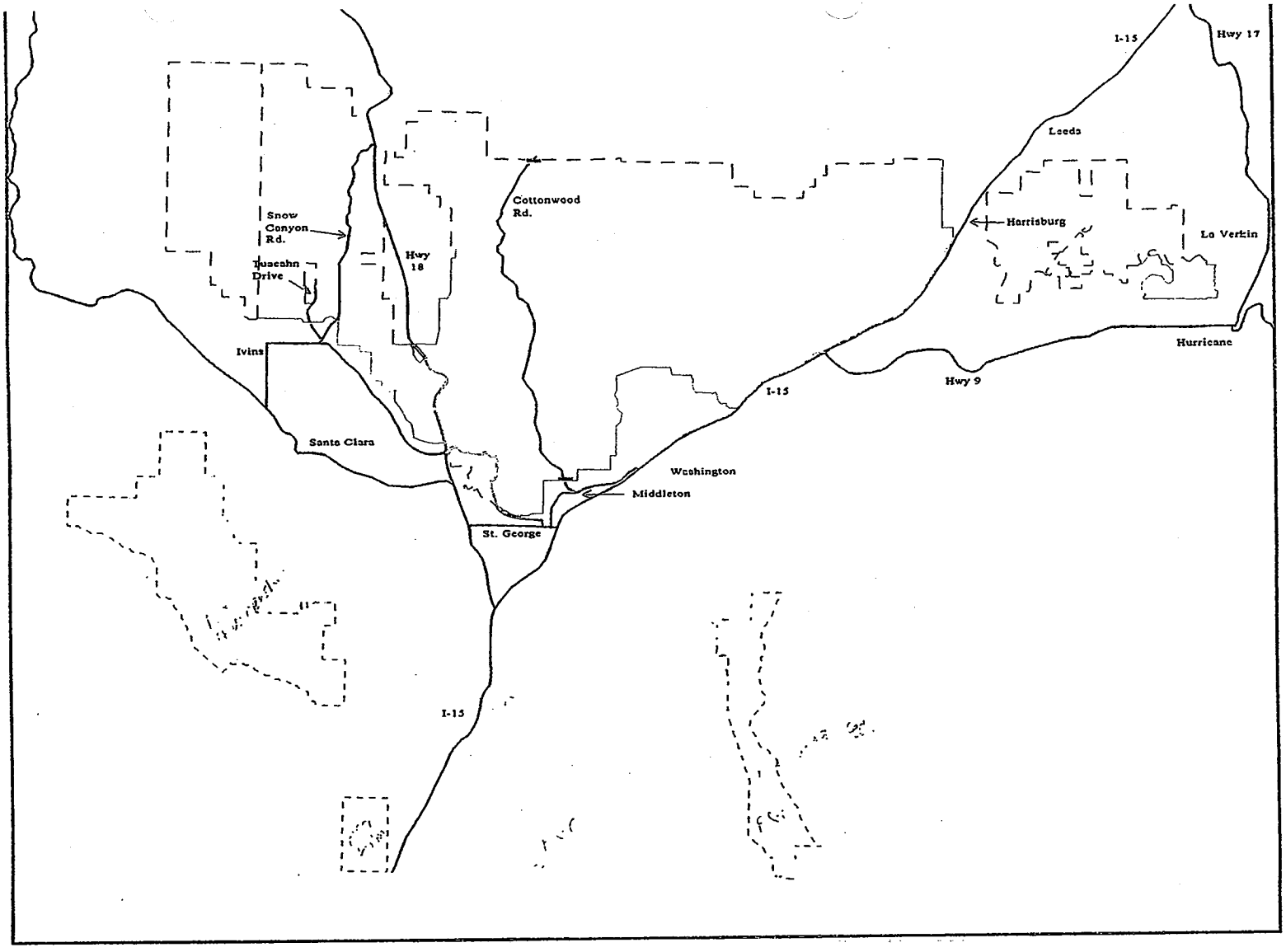
In addition to fencing, vehicle barriers are proposed for the following locations (these are not shown on Figure 5.1).

- Gate to remain on dirt road off Snow Canyon Road (above the Tuacahn Road) for utilities access.
- Gate roads off Skyline Drive, east of I-18, which provide utility access.
- Gate two utility access roads off the north end of the North Washington reserve line.
- Gate road off Interstate 15, heading west, about 1.5 miles south of the Red Cliffs Road.
- Cottonwood Road will either be gated where it crosses the northern and southern boundary of the reserve, or it will be fenced.

5.2.2 Law Enforcement

Law enforcement can help protect the desert tortoise from adverse impacts and is recognized as a very important mitigation measure. Habitat may be degraded and desert tortoises harmed or killed by OHV use, free-roaming (or unleashed) domestic dogs, and hiking, camping, shooting and other unpermitted uses. Effective law enforcement can help prevent these kinds of impacts.

The law enforcement responsibilities discussed above are split between two agencies: the UDWR and the BLM. The UDWR has primary responsibility for enforcing wildlife laws in the State of Utah (as well as overseeing auditing clearance under the HCP), while the BLM is a land management agency which has been granted law enforcement authority by Congress. The HCP proposes to provide for two full-time law enforcement agents, one for each agency, to enforce Federal, State, and local regulations within the proposed desert tortoise and plant reserves. The funding level for each agency is $65,000 per year, for a combined total over five years of $650,000. It is anticipated that after five years a National Conservation Area (NCA) will be established for the reserve and law enforcement funding will be available to the BLM.



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Human, Pet, and Desert Tortoise Fence

Desert Tortoise Fence

Vehicle Barrier

Plant Protective Fence

DWMA Boundary

Plant Preserve Boundary

Roads

Figure 5.1. Fencing Plan

Assuming Congress enacts legislation establishing the proposed NCA, the BLM may enter into a cooperative agreement with UDWR to provide law enforcement for the NCA. In the event that the NCA is not established within five years, the County and UDWR will provide the requisite law enforcement for as long as such enforcement is required by the terms of the permit. The County's assistance will be in the form of existing law enforcement resources (i.e,. sheriff's office) and by cross-training the HCP administrator and his staff to handle enforcement duties. The Section 10(a) permit shall not be jeopardized by these actions. Law enforcement reports will be provided by BLM and UDWR to the HCP administrator for inclusion in quarterly and annual reports.

5.2.3 Education

Education is an important component of the HCP program. An education committee has been established to work on developing an environmental education center in the County. The mission statement of the education committee is "to foster cooperation between the education community; local, State and Federal governments; and private interests with respect to the establishment of a nature education center. The center would provide opportunity for people of all ages and backgrounds to gain a greater understanding of the unique and varied ecosystems found in Washington County."

At this stage, numerous ideas are being considered and different alliances with other organizations and other funding sources are being explored. The preferred site for the nature center is Paradise Canyon. The HCP has committed $500,000 over the permit period towards this effort, and progress will be reported in quarterly and annual reports by the HCP administrator. The County will also prepare an education plan specific to the HCP.

5.2.4 Translocation

5.2.4.1 Five-year Translocation Research Experiment

Translocation of taken desert tortoises is considered a critical aspect in implementing the HCP. To date, the translocation of "taken" desert tortoises in other regions of the Mojave Desert has met with limited success. To further the scientific knowledge of translocation and in an effort to provide the greatest opportunity possible for the survival of taken animals, the USFWS has agreed to fund a five-year translocation study in Washington County (estimated to cost $750,000). Animals to be used in the translocation study will come from Washington County, Utah only. The County and USFWS will cooperate with the principal investigator in identifying possible translocation sites, research design, animal care and facility needed for the five-year research period. Translocation site selection will be mutually agreed upon by USFWS, the principal investigator, BLM, UDWR, and the County, based on the best scientific information available. It is anticipated that the research needed for translocated animals will be accommodated through the clearing program developed for the County's "incidental take" permit. Specifically, the County will be responsible for surveying desert tortoise habitat, removing individuals, and temporary care of desert tortoises. Washington County's responsibility for taken desert tortoises to be used in this translocation research will cease once

they are turned over to USFWS's designated agent in Washington County. However, if cleared animals run in excess of research needs, the County will translocate desert tortoises in a manner determined after consultation with USFWS and UDWR. Released desert tortoises will not be the responsibility of the County. USFWS understands the County will use its best efforts to preserve the life of "taken" desert tortoises but that the County is not responsible for the ultimate disposition of these "taken" individuals.

5.2.4.2 Translocation other than Five-Year Research Experiment

The HCP has established a fund of $1,000 per month to handle temporary desert tortoise care for the entire 20-year HCP period, for a total budget of $240,000. This care would include a facility for temporarily holding animals cleared from take areas as needed. For cost-effective reasons, the County agrees with the USFWS that it would be useful if such a facility, if possible, also served research needs. Should the translocation study prove successful, then a translocation program will likely be instituted for the remainder of the permit period to be funded by the HCP and other sources (which might necessitate a reallocation of the HCP budget). UDWR is expected to receive a permit from the USFWS to facilitate the removal and relocation of tortoises in conjunction with the County. Translocation efforts will be reported by the USFWS and/or the principal investigator to the HCP administrator for inclusion in quarterly entities, the development of a translocation/holding facility in conjunction with the development of the desert wildlife education center. Several possible sites have been identified that could serve as both a holding facility and education center. Such a facility would provide educational opportunities for the citizens of Washington County and protection for several of the sensitive desert species in addition to the desert tortoise.

5.3 MITIGATE INCIDENTAL TAKE

The primary mitigation for the proposed level of incidental take will be the acquisition and management of a reserve encompassing 38,787 acres of desert tortoise habitat and an additional 22.254 acres. This section details how this reserve will be acquired, managed, and monitored. It will also discuss the acquisition of grazing permits.

5.3.1 Reserve Acquisition

The objective of the reserve acquisition program is to consolidate desert tortoise habitat into public ownership and management. Acquisition of private, municipal, and State School Trust lands within the proposed reserve will be accomplished through land exchange and purchase. These programs are considered the most important and expensive mitigation provided for the protection of the desert tortoise, and their implementation will be a key assignment of the HCP administrator. An exchange budget has been created with $500,000 to pay for appraisals, inventories, title work, legal consultation, and other necessary expenses.

5.3.2 Reserve Management

Figure 3.1 presents the boundaries of the proposed reserve. The Steering Committee has sought and obtained the support of the Utah State BLM as well as the Congressional delegation for designating the reserve an NCA to be managed by the BLM. This designation is important as it allows both management funding and enhanced opportunities to receive L&WCF monies for the purchase of additional lands within the boundaries.

Until such time as an NCA designation is obtained and additional Federal monies are allocated for its management, the BLM will manage the reserve to benefit the Mojave desert tortoise in perpetuity. It is anticipated that a management plan will be completed by BLM within two years following permit issuance. The HCP will provide interim funding to the BLM for reserve management in ten semi-annual installments of $25,000, for a total of $250,000 over five years. It is anticipated that private and State School Trust lands within Zone 2 will be acquired by the BLM, but it is the intent of the State, County, and cities that Zone 2 be managed as part of Snow Canyon State Park, and it is anticipated that the exchange legislation will fulfill this intent. UDNR will have the responsibility to develop a desert tortoise management plan for the entire Park, also within two years of permit issuance. The HCP will provide $50,000 to UDNR to assist in management efforts. In all, the HCP will provide $300,000 to land management agencies for desert tortoise reserve management. Management efforts will be reported by the respective agencies (Town of Ivins, BLM, and UDNR) in quarterly and annual reports.

The BLM will take the necessary steps to accomplish the withdrawal of the lands from mineral location. Such withdrawal will bar the location of new mining claims but will not affect valid existing rights.

It is acknowledged that no mitigation credit will be attributed to this HCP for establishment of an NCA. Mitigation credit will be granted for lands within the NCA once the lands are acquired and uses incompatible with the purposes of the NCA are eliminated. Further, since no mitigation credit will be allowed for its establishment, issuance of the incidental take permit and implementation of the provisions of this HCP will not be delayed until such time as the NCA is officially designated.

5.3.3 Reserve Monitoring

An ongoing study will be funded throughout the permit period to monitor the status of the desert tortoise population. A monitoring plan will be developed by UDWR in consultation with the USFWS and the Recovery Team. Reserve monitoring of desert tortoises will emphasize research aimed at understanding whether the population is increasing or declining and the causal factors for the identified trend. This can include surveys, demographic information, the determination of reproductive success, etc. The HCP will provide funding in the amount of $1.000.000 during the permit period to help fund monitoring efforts. The UDWR is expected to spend approximately $250,000, which includes Section 6 funding, over the next 20 years for desert tortoise monitoring. They have agreed to combine these funds with the HCP monitoring budget to create a fund of $1,250,000 over the life of the permit period.

5.3.4 Grazing Permit Acquisition

The objective of acquiring grazing permits is to eliminate any potential adverse impact from grazing on the Mojave desert tortoise. BLM has been consulting with the USFWS since 1990 on grazing in desert tortoise habitat. Figure 5.2 presents all of the grazing allotments that extend into the proposed reserve. Portions of allotments that extend into Zone 3 will be purchased. Grazing allotments that extend into Zones 1 and 2 do not include desert tortoise habitat and will not be purchased. There are no federal grazing allotments in Zone 5, and grazing allotments within Zone 4 are not identified for purchase by the County. Table 5.1 presents information on grazing allotments on public and State trust lands in the reserve. Acquisition costs are estimated at approximately $75.00/AUM, with a total estimated cost of approximately $175,000. It is believed that most of the grazing permittees listed in Table 5.1 are willing sellers; however, no permits will be purchased unless a "willing seller–willing buyer" arrangement exists.

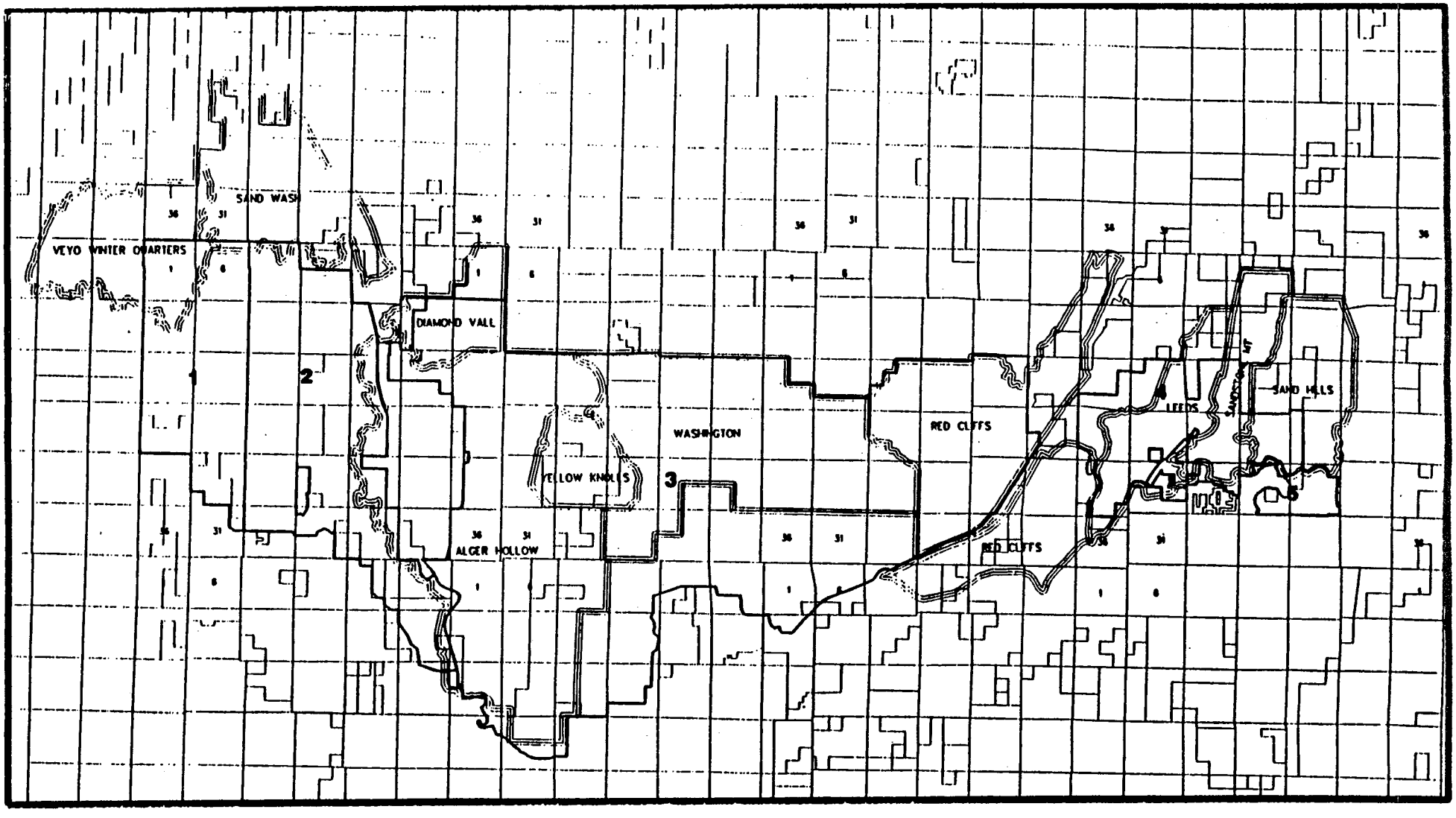
Table 5.1. Grazing Allotments to be Acquired.

Name	Total Acreage	Acreage Within Reserve Boundaries	Federal AUM's	State AUM's
Alger Hollow	16,878	12,700	741	124
Yellow Knolls	2,053	1,863	16	0
Washington	20,563	10,143	256	870
Red Cliffs	19,022	5,325	425	0

Once these grazing permits have been acquired, annual non-use will be applied for according to BLM requirements. The BLM will authorize non-use for conservation and protection purposes for grazing privileges in the identified habitat areas. Grazing will not be permitted during the non-use period on acquired allotments until a definitive study of livestock/desert tortoise interrelationships has been completed, which demonstrates that livestock grazing is consistent with reserve management objectives.

5.4 PROGRAMS FOR OTHER THREATENED AND ENDANGERED SPECIES IN WASHINGTON COUNTY

The HCP has allocated $1,950,000 for other species enhancement. Within one year of permit issuance, the Technical Committee will draft an "Other Species" plan for review by the HCAC, which will outline a broad range of possible programs, however individual efforts will be identified within the annual work plans. One high priority program described below is for protection of several areas which contain one or both of the endangered plants considered in this HCP. A preliminary program for fencing has been presented in the fencing map (Figure 5.1), and it is anticipated that HCP law enforcement personnel will conduct regular patrols and the HCP will help facilitate land acquisitions. It should be noted that these plant reserves would be managed by BLM, and therefore their designation and management would



Grazing Allotment Boundary

Proposed DWMA Boundary

Figure 5.2. Grazing Allotment Boundaries Within the Proposed Preserve

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be subject to Section 7, NEPA, and evaluation and approval through BLM's resource management planning process. At this time, the following management prescriptions are recommended:

- Use of existing roadways and utilities would be allowed to continue.
- No OHV vehicles; non-motorized bikes may be allowed in designated areas.
- No organized or competitive sporting or recreational events should be allowed.
- Non-consumptive, recreational uses should be allowed.
- BLM would request mineral withdrawal for these areas.
- BLM would manage these areas as Oil and Gas Category 3.
- The areas would be closed to mineral material sales.
- Utilities and other rights-of-way would be allowed based upon affirmative Section 7 consultations.
- Impacts from livestock grazing on T&E plants would be evaluated through monitoring studies, and management prescriptions would be applied as appropriate.
- Approximately 26.1 miles of proposed fencing to be constructed by the HCP may result in adverse impacts to livestock grazing. These activities will be conducted consistent with BLM regulations.
- Research would be allowed which is compatible with the protection of T&E plants.
- The areas would be closed to vegetation sales.
- Hunting would be allowed only during regulated seasons.

CHAPTER 6.0
PERMIT ADMINISTRATION

6.1 OVERVIEW OF PERMIT ADMINISTRATION

The Washington County Habitat Conservation Plan (HCP) will be administered by the Washington County Commission (Commission). The Commission has selected an HCP administrator who would be responsible to implement the Plan under the terms of the Section 10(a)(1)(B) permit. The administrator will work with a Habitat Conservation Advisory Committee (HCAC) and be assisted by a full-time County biologist and a Technical Committee (TC). Monies will be collected county-wide and disbursed by the HCP administrator according to an annual work plan to implement this HCP.

6.2 ROLE OF HCP PERSONNEL AND COMMITTEES

6.2.1 HCP Administrator

The HCP administrator is a Washington County employee in charge of a new County department. He will review all endangered species issues relevant to the Washington County HCP and make recommendations on how to proceed to the Commission. While the HCP administrator will be directly supervised by a Commission member, he will work closely with the HCAC, and all recommendations made and significant actions taken by the HCP administrator must be reviewed by the HCAC. The HCP administrator will also supervise a full-time biologist and serve as the County's liaison between the public and all entities concerned with implementation of the HCP. An organizational chart depicting the information flow between the various individuals, agencies, and commissions is presented in Figure 6.1.

On an annual basis, the HCP administrator will prepare an annual work plan and a report detailing how well the previous year's work plan was accomplished. The annual work plan is discussed in greater detail later in this chapter.

On a day-to-day basis, the HCP administrator will process applications for incidental take; direct the activities of the HCP biologist; meet regularly with the HCAC; facilitate the acquisition of grazing permits; facilitate the acquisition of private and State lands into the reserve; coordinate with the HCP law enforcement personnel; oversee the monitoring of the reserve; and supervise the expenditures for other mitigation measures, such as fencing, in keeping with all local, State, and Federal laws.

The HCP administrator is funded for the entire 20-year permit period, at a rate of $54,000 per year, for a total funding amount of $1,080,000. At a fringe rate of approximately 35 percent, this would allow for an annual salary of $40,000. Office, travel, and secretarial support is funded at a level of $20,000 per year, for a total of $400,000 over the permit period.

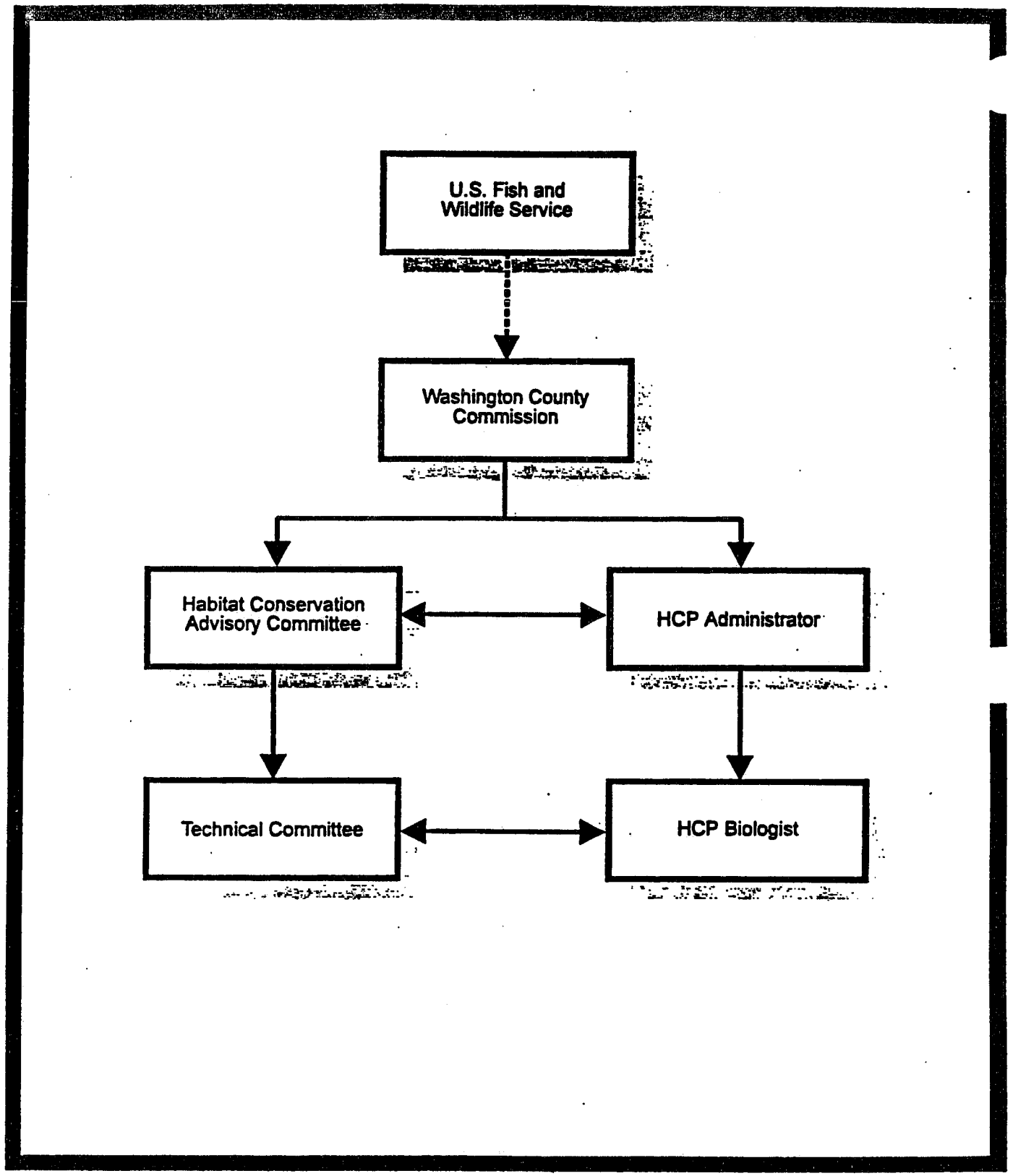

Figure 6.1. HCP Information Cross Flow

6.2.2 HCP Biologist

The HCP biologist will be a full-time position with the following responsibilities:

- Conduct desert tortoise surveys and removals, intensively during a four-month period and occasionally during the other eight months of the year.
- Coordinate the activities of the Technical Committee.
- Assist the HCP administrator on an as-needed basis, including preparation of the annual work plan items specific to desert tortoise recovery. The annual work plan should include the development of protection and recovery activities for other Federally listed, candidate, and State sensitive species.
- Monitor the incidental take permit activities and produce quarterly reports on the quantity and location of incidental take.
- Document and report illegal activities to law enforcement personnel.
- Develop a working relationship with UDWR and Federal agencies regarding conservation planning for Washington County.
- Attend and participate in appropriate professional conferences and workshops.

The HCP biologist has been funded at an annual rate of $38,000 per year, which should allow for an annual salary of approximately $28,500 per year, for a total of $760,000 over the permit period. Travel, office, and secretarial support are included in the $20,000 annual budget discussed under the HCP administrator duties above.

6.2.3 Habitat Conservation Advisory Committee (HCAC)

The HCAC would oversee the administration of the HCP and would serve in an advisory capacity to the Commission regarding county-wide threatened, endangered, and candidate species matters. When necessary, the HCAC will function as interpreters of the HCP document and, as such, give direction to the HCP administrator (subject to the final review of the Commission). They will direct the activities of the administrator and review and approve the annual work plan and quarterly and annual reports on the quantity of take and mitigation implemented prior to submission of the documents to the County Commission. All deficiencies in the reports identified by the HCAC will be corrected or completed by the HCP administrator. The HCAC will also oversee the expenditure of mitigation monies, review and make recommendations regarding the appropriateness of proposed amendments to the HCP, and provide problem-solving and advice to the HCP administrator.

The HCAC will include representation from the UDNR, BLM, USFWS, an environmental organization (representative designated by the Commission), local government (designated

by the Washington County Mayors' Association), local development (designated by the Commission), and a citizen at large (selected from the largest contributing municipality after recommendation from that municipality's governing board). Agency representatives will be nominated to the Commission by their respective agencies. Only the four non-agency members will rotate positions, with two positions serving two-year terms and two serving three-year terms. The HCAC will meet at least once a month and operate by consensus. The chairperson of the committee will be determined by the committee members and rotate annually.

6.2.4 Technical Committee (TC)

Members of the TC shall serve at the discretion of the Washington County Commission and will include the HCP biologist; a local biologist; and representatives from the UDWR, BLM, USFWS, and NBS (National Biological Service). The agency representatives will be nominated to the committee by their respective agencies and approved by the Commission. The TC will be available to the HCP administrator and the HCAC on an as-needed basis to provide biological information on endangered, threatened, and candidate species. The TC will participate in the initial development of the annual work plan by recommending how the amount of money allocated annually for mitigation should be expended. They will involve other specialists as necessary; however, all expenditures identified by the TC must be approved by the HCAC. The chairperson of the TC will be determined by the committee members and rotate annually.

6.3 REPORTS

6.3.1 Annual Work Plan

Annual planning and budgeting will be an important component of implementing the HCP. The process of developing the annual work plan is itemized in Table 6.1. This plan will specifically detail what is to be accomplished that year in terms of fulfilling HCP mitigation requirements. The annual work plan will include details of the work to be accomplished, the target dates for completion and report submission, who will do the work, and how it will be funded. It will also contain a review of the accomplishments and progress towards implementing the previous annual work plan (see number 3 below). It will be written by the HCP administrator by October 1 of the preceding year and reviewed by the HCAC during October. The annual work plan and report will be submitted to the Commission by November 15 under a cover memo which makes a consensus recommendation for or against approval. If no consensus is reached in the HCAC, that information will be forwarded to the Commission with the work plan. The Commission would then either approve the document, make changes, or refer it back to the HCAC for additional work. The approved document shall then be submitted to the USFWS.

Table 6.1. Annual Work Plan Tasks

Task #	Task Responsibility	Task
1	HCP Administrator	Establish budget
2	HCP Administrator	Identify non-discretionary budget items
3	HCP Administrator	Provide TC with discretionary budget amount
4	TC	Identify mitigation priorities based on budget and recommend to HCP Administrator
5	HCP Administrator	Prepare preliminary budget for HCAC review
6	HCAC	Review/revise preliminary budget
7	HCP Administrator	Prepare draft annual work plan
8	HCAC	Review draft and comment
9	HCP Administrator	Prepare final plan
10	HCAC	Review final plan and sign
11	HCP Administrator	Present final plan to County Commission
12	Commission	Approve final plan (or return to #9 if changes are necessary)
13	HCP Administrator	Forward final plan to USFWS

6.3.2 Quarterly Reports

On a quarterly basis, the HCP administrator will prepare a report detailing all actions taken during the quarter. Quarterly reports will be presented to the HCAC at their monthly meetings in January, April, July, and October of each year. The following information will be included in each quarterly report:

Clearances Requested:	Owner, Number of Acres, Legal Description, General Location.
Surveys Conducted:	Owner, Number of Acres, Results, Who Conducted Survey.
Audits Performed by UDWR:	Owner, Number of Acres, Person Conducting Survey, Discrepancies Noted.
Removals Conducted:	Owner, Acres, Number of Passes, Number of Desert Tortoises Expected, Number of Desert Tortoises Removed.
Blood Work:	Number of Desert Tortoises Processed, Whether the Desert Tortoise was Euthanized, Number of Days in Temporary Care.
Translocation Efforts:	Number of Desert Tortoises Transferred to USFWS (first five years of plan).
Law Enforcement:	Report by UDWR and BLM.
Fencing:	Fence Construction and Maintenance Actions Conducted.
Education:	Education Efforts.
Reserve Acquisition:	Summary of Acquisitions Made, Progress to Date, Problems Encountered.
Reserve Management:	Reports by Town of Ivins, BLM, and UDNR.
Reserve Monitoring:	Report by UDWR.
Other Species Efforts:	Report by HCP Biologist.

6.3.3 Annual Report

Submitted with the annual work plan will be a report by the HCP administrator detailing the accomplishments of the previous year and how well the goals and objectives of the previous year's work plan were met. The annual report will combine and summarize all of the information contained in the quarterly reports for the year, review each stated goal in the annual work plan, and discuss how well each goal was met. For mitigation measures, the annual report will discuss what was implemented, how well budget targets were met, the effectiveness of the implementation, and other aspects of mitigation implementation. The annual report will detail any particular problems encountered in implementation and make recommendations to the HCAC for changes in procedures or mitigation elements. This annual report will be filed with the USFWS following approval by the HCAC and Commission.

6.4 FUNDING COLLECTION AND DISBURSEMENT

A basic element of an HCP is the creation of a funding mechanism to support monitoring and mitigation elements for permanent habitat conservation. An Endangered Species Trust Fund has been established that will work like other dedicated trust funds in the County. All monies collected will be deposited in this fund, and all expenditures will come out of this fund. Procurements sought by the HCP administrator will have to be recommended by the HCAC and approved by the Commission. Annual budgeting and accounting oversight will be handled similarly to other departments within the Washington County government, and budget and expenditure reports will be available to the HCAC prior to each scheduled meeting. Sources of permanent funding will include the following:

- A county-wide fee will be assessed when a building construction permit is issued. This fee will be 0.2 percent of construction costs, and will apply to all new residential, commercial, and industrial construction in Washington County.

- A county-wide fee of $250.00/acre for plotted subdivisions, condominiums, town homes, or PUD's.

- Funding may also be available through desert tortoise compensation fees collected by the BLM; however, these monies will need to be accounted for separately according to the terms and conditions of the Biological Opinion under which they were collected. These monies will be collected by the individual cities and BLM and transferred to the County Treasurer on a quarterly basis. The cities will be authorized to charge a handling fee over-and-above that amount required under this HCP. Based on Utah State growth projections, the committee believes projected revenues over the 20-year period should exceed $9,000,000 (see Table 6.2). Any excess monies above $7,000,000 may be expended on either the desert tortoise or

Table 6.2. Revenue Projection

YEAR	POP.	INC.	RES. PERMITS	SEC. PERMITS	TOTAL RES.	VALUE OF RESIDENTIAL	RESIDENTIAL ESA FEES	COMMERCIAL ESA FEES	CUMULATIVE ESA FEES	DEV. ACRES	DEVELOPMENT FEE@$250/AC	CUMULATIVE DEV. FEE	TOTAL FEES GENERATED
1993	59,079												
1994	61,657	2,578	806	226	1032	$103,176,535	$206,353	$41,271	$247,624	344	$85,980	$85,980	$333,604
1995	64,766	3,109	972	273	1244	$124,428,180	$248,856	$49,771	$546,251	415	$103,690	$189,671	$735,922
1996	67,830	3,064	958	269	1226	$122,627,193	$245,254	$49,051	$840,557	409	$102,189	$291,860	$1,132,417
1997	71,170	3,340	1044	293	1337	$133,673,246	$267,346	$53,469	$1,161,372	446	$111,394	$403,254	$1,564,627
1998	74,146	2,976	930	261	1191	$119,105,263	$238,211	$47,642	$1,447,225	397	$99,254	$502,509	$1,949,734
1999	78,138	3,992	1248	350	1598	$159,767,544	$319,535	$63,907	$1,830,667	533	$133,140	$635,648	$2,466,315
2000	81,845	3,707	1158	325	1484	$148,361,294	$296,723	$59,345	$2,186,734	495	$123,634	$759,283	$2,946,017
2001	86,006	4,161	1300	365	1665	$166,531,250	$333,063	$66,613	$2,586,409	555	$138,776	$898,059	$3,484,468
2002	89,187	3,181	994	279	1273	$127,309,759	$254,620	$50,924	$2,891,953	424	$106,091	$1,004,150	$3,896,103
2003	92,421	3,234	1011	284	1294	$129,430,921	$258,862	$51,772	$3,202,587	431	$107,859	$1,112,009	$4,314,596
2004	95,707	3,286	1027	288	1315	$131,512,061	$263,024	$52,605	$3,518,216	438	$109,593	$1,221,603	$4,739,818
2005	99,023	3,316	1036	291	1327	$132,712,719	$265,425	$53,085	$3,836,726	442	$110,594	$1,332,197	$5,168,923
2006	102,848	3,825	1195	336	1531	$153,083,882	$306,168	$61,234	$4,204,128	510	$127,570	$1,459,767	$5,663,894
2007	106,242	3,394	1061	298	1358	$135,834,430	$271,669	$54,334	$4,530,130	453	$113,195	$1,572,962	$6,103,092
2008	110,762	4,520	1413	396	1809	$180,899,123	$361,798	$72,360	$4,964,288	603	$150,749	$1,723,711	$6,687,999
2009	115,118	4,356	1361	382	1743	$174,335,526	$348,671	$69,734	$5,382,693	581	$145,280	$1,868,991	$7,251,684
2010	118,934	3,816	1193	335	1527	$152,723,684	$305,447	$61,089	$5,749,230	509	$127,270	$1,996,261	$7,745,491
2011	122,294	3,360	1050	295	1345	$134,473,684	$268,947	$53,789	$6,071,967	448	$112,061	$2,108,322	$8,180,289
2012	125,493	3,199	1000	281	1280	$128,030,154	$256,060	$51,212	$6,379,239	427	$106,692	$2,215,014	$8,594,253
2013	128,648	3,155	986	277	1263	$126,269,189	$252,538	$50,508	$6,682,286	421	$105,224	$2,320,238	$9,002,524
2014	131,803	3,155	986	277	1263	$126,269,189	$252,538	$50,508	$6,985,332	421	$105,224	$2,425,462	$9,410,794

NOTES

POPULATION PROJECTION BY UTAH STATE PLANNING OFFICE
ASSUMES THE VALUE OF A RESIDENTIAL PERMIT WILL BE $100,000
ASSUMES A RESIDENTIAL PERMIT FOR EVERY 3.2 NEW PEOPLE
ASSUMES A SECONDARY RESIDENTIAL PERMIT FOR EVERY 11.4 NEW PEOPLE
ASSUMES COMMERCIAL WILL BE 20% OF RESIDENTIAL
ASSUMES ONE ACRE OF DEVELOPMENT FOR EVERY 3 RESIDENTIAL PERMITS

other T&E species at a ratio recommended by the HCAC and HCP administrator and approved by the Commission. However, it is the current intention of the Commission to limit funding for the desert tortoise to $7,000,000 so that other funding can eventually be made available for other species.

6.5 FUNDING

A budget is presented in Table 6.3. Where cost sharing is proposed, the Commission will work diligently to secure these commitments from the other parties. Although it would be preferable to be able to fund all the mitigation measures in year one of the plan, the reality is that mitigation monies will flow into the endangered species trust fund over the course of the 20-year permit period. The Steering Committee is investigating sources of funding to be able to provide substantial start-up monies. Table 6.4 presents discretionary and non-discretionary spending over the 20-year permit period. Non-discretionary spending includes funding for the HCP administrator, HCP biologist, office and travel expenses, grants to agencies for management, temporary shelter for dislocated desert tortoises, land exchange facilitation, and law enforcement. Discretionary spending included habitat acquisition, fencing, purchase of grazing permits, reserve monitoring, and education. All monetary amounts discussed in this document are in 1994 dollars. It is anticipated that inflation will increase the cost of the mitigation measures described in the HCP as well as the value of building permits.

6.6 INCIDENTAL TAKE PROCESS

The incidental take process is presented in Figure 6.2 and described below. All private and State School Trust lands in Washington County have been delineated into four categories. *Reserve lands* are those State and private parcels located within the proposed reserve boundary presented in this HCP. No incidental take of desert tortoises will be allowed on reserve lands. *Incidental take areas* are those State and private lands which are designated as desert tortoise habitat for purposes of this HCP and are not located within the proposed reserve boundary. Incidental take will be allowed on these lands according to the process shown in Figure 6.2 and detailed below. *Potential habitat areas* are those State and private lands which may contain desert tortoises, and therefore desert tortoise surveys and removals are required. However, landowners in these areas will not have to comply with the other aspects of the incidental take process. *Exclusion areas* are all remaining State and private lands which are not believed to be desert tortoise habitat and for which no surveys are required.

Table 6.3. HCP Budget Items

Budget Item	Total Cost	Washington Cty.	Other Entity
HCP Administrator @ $54,000/year for 20 years	$ 1,080,000	$ 1,080,000	$ 0
HCP Biologist @ $38,000/year for 20 years	760,000	760,000	0
Office and Travel Expenses @ $20,000/year for 20 years	400,000	400,000	0
Facilitate Land Exchanges	500,000	500,000	0
Habitat Acquisition	1,000,000	1,000,000	0
BLM Reserve Management @ $50,000/year for 5 years	250,000	250,000	0
SCSP Management Plan Preparation	50,000	50,000	0
Fencing	2,000,000	500,000	1,500,000[1]
Purchase Grazing Permits	175,000	175,000	0
Reserve Monitoring (i.e., research)	1,250,000	1,000,000	250,000[2]
Law Enforcement @ $130,000/year for 5 years	650,000	650,000	0[3]
Translocation			
a) Temporary Tortoise Care @ @ $1,000/month for 20 years	240,000	240,000	0
b) Translocation Experiment @ $150,000/year for 5 years	750,000	0	750,000[4]
Education	500,000	500,000	0[5]
Other Species	1,950,000	1,950,000	0
Total	$ 11,555,000	$ 9,055,000	$ 2,500,000

[1] The HCP will work with UDOT to construct desert tortoise fencing along Highway 18 and Interstate 15. Developers along the perimeter of the reserve will construct fencing at their expense.

[2] The UDWR currently spends approximately $60,000 every five years, including Section 6 funding from the USFWS, and this funding level is expected to continue through the permit period.

[3] Two law enforcement positions will be funded for the first five years of the plan, one with UDWR to handle wildlife enforcement issues, and one with the BLM to handle reserve management issues.

[4] Translocation research will be funded by the USFWS.

[5] The education center will be part of a larger organization, which as of yet is undefined.

Table 6.4. Non-Discretionary Budget Items

All dollar amounts in thousands, constant 1994 dollars

Funding Item	Budget	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Non-Discretionary Spending																					
Administrator	$1,080	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54	$54
Biologist	$760	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38	$38
Office/Travel	$400	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20	$20
BLM Reserve Mgt	$250	$50	$50	$50	$50	$50	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SCSP Reserve Mgt	$50	$10	$10	$10	$10	$10	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Temp tortoise Care	$240	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12
Land Exchange Fac.	$500	$250	$250	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Law Enforce-BLM	$325	$65	$65	$65	$65	$65	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Law Enforce-UDWR	$325	$65	$65	$65	$65	$65	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Non-Discretionary Spending	$3,930	$564	$564	$314	$314	$314	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124	$124
Budget	$9,000	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Start-Up	$400	$200	$200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Available	$9,400	$650	$650	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Amount Available For Discretionary Spending	$5,470	$86	$86	$136	$136	$136	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326	$326

All landowners within the incidental take and potential habitat areas will be notified by mail of the Section 10(a)(1)(B) permit requirements within the first three months following permit approval. Landowners may appeal the classification of their land to the HCAC. The following procedures will apply to the incidental take areas:

- A landowner whose land partially or entirely falls within the incidental take area must notify the HCP administrator prior to site grading to have the property surveyed for desert tortoises. The HCP biologist would then schedule the survey and removal of desert tortoises from the property, at no additional cost to the landowner. Desert tortoise surveys and removals will be scheduled for March 15 through May 15, and from August 20 through October 20. As the biologist's schedule may become quite busy, a landowner would have the option of hiring a consultant to conduct the work at a more expeditious rate. All consultants, including the HCP biologist, will be required to possess valid State and Federal desert tortoise handling and collecting permits. The HCP administrator will maintain a list of qualified biologists, which will be periodically reviewed by the USFWS. At a future date, the USFWS may develop certification criteria for the list. As a landowner may desire to conduct surveys and removals at times outside of these specified windows, the HCAC may recommend to the Commission that a fee be charged to cover the additional costs of processing and temporary desert tortoise shelter.

- Forms, to be developed by the HCP administrator and approved by the HCAC, will document survey results, removal actions, and provide official clearance to proceed. Completed survey forms will be submitted to the HCP administrator for review and approval. UDWR will also receive copies of survey and removal forms. Presence/absence survey results will be considered valid for a period of 90 days, while removal results will be considered valid for 60 days.

- Presence/absence surveys will follow current USFWS protocol with the exception that zone-of-influence surveys will only be necessary at the 100- and 300-foot boundary. If the presence/absence survey indicates that desert tortoises are on the property, the HCP biologist (or consultant retained by the landowner) will remove the desert tortoises from the property. Although removal results are only valid for 60 days, once the removal process is complete, any desert tortoises found on the property shall also be collected. UDWR will conduct periodic audits of survey and removal actions.

- UDWR will have one week following completion of surveys and availability of survey results in which to conduct an audit. During this period, a seven-day working hold is placed on the property. The TC will recommend criteria to the HCAC to determine audit failure. However, should an audit fail, then the landowner will have to hire another consultant who will conduct the survey in the presence of the UDWR, and at a time suitable to the UDWR.

- Following removal (if desert tortoises were present), or a finding of no desert tortoises, then the property may be processed for incremental implementation (see Section 6.7).

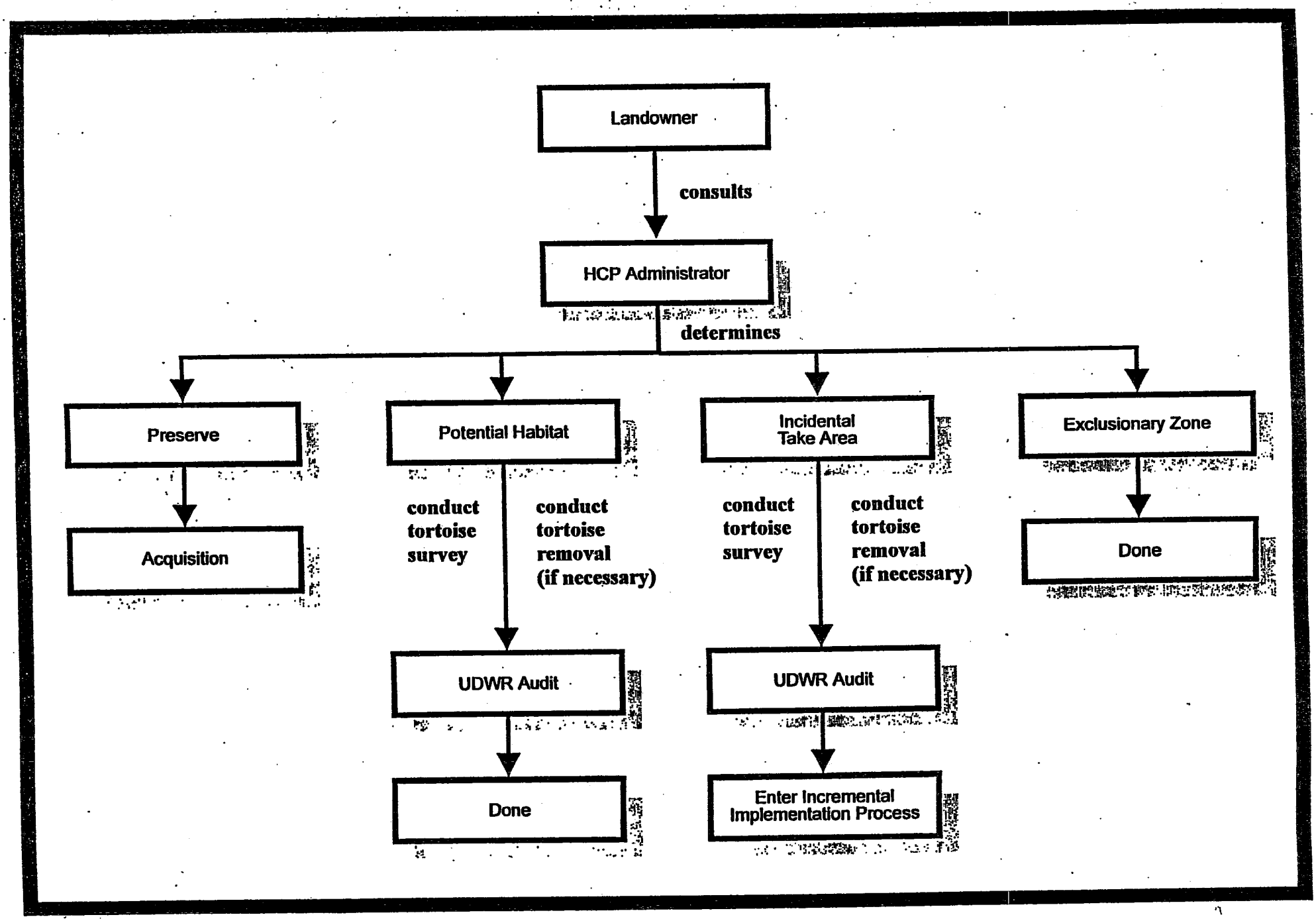

Figure 6. Incidental Take Process

- All desert tortoises removed from the property will be taken to a temmporary tortooise facility. Desert tortoises will be delivered to the USFWS principal investigator or his/her agent for translocation during the first five years of the plan. Diseased desert tortoises may be euthanized by a veterinarian if deemed prudent.

- City and County ordinances will be amended to state that a landowner who does not ensure that a desert tortoise survey is performed prior to development in areas where surveys are required will have committed a Class B misdemeanor.

The following procedures will apply to potential habitat areas:

- A landowner or the authorized agent of any such owner wishing to undertake grading or any other disturbance of the lands under such owner or agent's ownership or control will notify the HCP administrator and schedule a desert tortoise survey by the HCP biologist. Forms similar to those used for the incidental take area will document survey results. Presence/absence surveys will be subject to audit by UDWR for a period of seven days following survey completion. If the survey results indicate that there are no desert tortoises present on the property, then the survey requirements for those lands will be deemed "fulfilled." If the survey indicates desert tortoises are present, then the HCP biologist will schedule the removal of the desert tortoises. Upon completion of the seven-day working hold, the tortoise survey requirements will be deemed complete and permitting process for those lands may proceed.

Other than the payment of development fees, the HCP stipulates no additional procedures for landowners located within the exclusion zone, and landowners who follow these procedures are exempt from the incremental implementation process.

6.7 INCREMENTAL IMPLEMENTATION

Incremental implementation is the concept that lands will only be released for take when other lands are acquired for the reserve and mitigation monies are expended. Incidental take will be allowed according to the schedule presented in Table 6.5, based on expenditures in various categories and acquisition of certain reserve habitats. Release of an acre of incidental take will result from an expenditure as low as $1,000 for an activity that directly benefits the desert tortoise (such as fencing or law enforcement), or as high as $10,000 for administration. The purpose of the sliding scale is to reward expenditures that directly benefit the desert tortoise. For habitat acquisition, an acre of take will be released for every 2.3 acres acquired within the reserve. It is important to help ensure optimal release of incidental take lands as a result of both expenditure of mitigation monies and acquisition of reserve lands. To this end, the HCP administrator and HCAC will monitor take and reserve acreage on an annual basis. This approach is designed to meet the objectives of the HCP.

While these formulas define the amount of take allowed as mitigation measures are implemented, it does not address the issue of who is allowed to benefit from the incidental take within each zone. This issue is left to the Commission, as they are the administrators

of the permit. To clarify, the amount of incidental take allowed incrementally is based on this HCP, while who is allowed the take is decided by the County. The administration and tracking of the incremental implementation process will be the responsibility of the HCP administrator.

6.8 PLAN AMENDMENTS

Changes to the HCP are anticipated to fall into one of two categories: minor or major. Minor changes, such as corrections in land ownership, minor revisions to the utility protocols, minor modifications in fencing needs due to topography, or minor changes to the reserve boundaries or its configuration that result in no net loss of reserve land or in viability of the reserve, are proposed to be adopted by unanimous consent of the HCAC and approved by the Commission and are not considered to be an amendment to the HCP. Material major changes, such as significant alterations in funding or schedule, or significant boundary revisions, would have to be accomplished by formal amendment. These amendments would be reviewed by the HCAC; formally proposed to the USFWS by the Commission; and ultimately approved, modified, or rejected by the USFWS. Of critical concern in evaluating any proposed amendment is the potential for adverse effect to any threatened or endangered species. The HCAC will be charged with evaluating any potential HCP amendment and will do this at least once a year in their June meeting. At the July meeting of the HCAC, public input will be allowed on the proposed amendments, and at the August meeting, the HCAC will make their recommendations regarding the proposed amendments to the Commission. If amendments are required at other times, a similar process will be followed. Any amendments approved by the Commission will be submitted to the USFWS. The USFWS will then determine whether a public hearing will be necessary for permit amendment. If the permit is not amended, the Commission may request an administrative or judicial review of the USFWS decision. (continued on next pg.)

Table 6.5. Incremental Implementation Release Schedule

Increment Per Acre Released	Category	Total Budget	Total Acres Released
$1,000 ($1,500)	Law Enforcement	$650,000	650
	Habitat Acquisition/Facilitation	$1,000,000	1,000
	Fencing	$500,000	500
	Monitoring	$1,000,000	1,000
	Habitat Acquisition for Other Species	?	?*
	HCP Biologist	$760,000	760
$5,000	Grazing Permits	$175,000	35
	Education	$500,000	100
	Translocation	$240,000	48
$10,000	Reserve and HCP Administration	$1,780,000	178
Acquisition of 2.3 acres Reserve Lands		18,428 acres	7,993
Total Released for Incidental Take			12,264

* If habitat is acquired for other species, it is possible that the number of acres which could be released under this incremental implementation schedule could exceed the number allowed under the HCP. It should be made clear that the only way the number of acres released for incidental take would exceed the number requested in the permit would be by amendment.

Any boundary adjustment determined to be significant by the HCAC will require an amendment of the HCP. No significant reduction or loss of habitat shall occur as a result of amendments. Any amendment to the HCP that affects conserved habitat or potentially lessens the mitigation to be provided for the benefit of any threatened and endangered species will require an amendment to the Section 10(a)(1)(B) permit. In this event, the proponent of the amendment will have to incure the expense of a consultant if the HCAC determines that further study is required. Such a consultant who will conduct a study and provide a biological assessment to determine the anticipated impact of the amendment on threatened and endangered species habitat and species individuals, as well as on other species of concern. No amendment to the HCP will be made that, in the opinion of the USFWS, would likely jeopardize any threatened or endangered species.

6.9 UNFORESEEN CIRCUMSTANCES

In response to unforeseen circumstances, any Party to the Implementation Agreement may request the HCAC to meet to discuss appropriate amendments to the HCP.

6.10 ACTIVITIES WHICH ARE PERMITTED FOR THE INCIDENTAL TAKE AREAS

The following activities will be covered by this incidental take permit:

- Grazing will be allowed.
- Utility easements will be maintained and new easements may be allowed for all utilities, including but not limited to roads; power, telephone, and cable television lines; and water, sewer, and natural gas pipelines.
- Land clearing will be authorized when in compliance with city or County zoning and building permitting procedures.
- Building construction will be allowed in compliance with city or County zoning and when authorized by the appropriate permitting entity.
- Hiking, sightseeing, camping, and equestrian activities, including competitive and recreational events, will be permitted throughout the area.
- Pets may be allowed when under the control of the owner as specified by the appropriate city or County ordinance.
- Vehicular use of the area will be allowed as regulated by city or County ordinance or State law.
- Agricultural land treatments such as plowing, disking, mowing, swathing, and harrowing will be allowed.
- Mining will be allowed when done in accordance with city, County, or State regulations.
- Drilling for resources, including but not limited to petroleum, natural gas, other hydrocarbons, and water, will be allowed for exploration or production purposes.
- Irrigation of areas for agriculture, landscaping, horticulture, or domestic purposes will be allowed.
- Use of herbicides and pesticides will be authorized when done according to State and Federal law.
- Firefighting will be allowed and required to abate the public nuisance and protect life and property.
- Military maneuvers will be allowed as authorized by the landowner and regulated by City. County and State regulations.

- Clearing for landfill exploration or production purposes as authorized by the appropriate licensing and approving entities.

- Harvest of vegetation, native or introduced, will be allowed with permission of the landowner, and with appropriate permits, if required.

- Collection of biological or mineral specimens will be allowed by authorization of the landowner and with the approval of the appropriate entity.

- Occupation of the area by residents, agriculture, commercial and\or industrial businesses is expected and may, on occasion, cause the demise of desert tortoises in the take area.

- Any other lawful activity will be allowed.

- Water management and conservation projects will be allowed when done in accordance with local, State, and Federal regulations.

6.11 IMPLEMENTATION AGREEMENT

The Implementation Agreement specifies the responsibilities of each of the participating cities and the parties. Ivins is the only city which is signatory to the Implementation Agreement between the County, BLM, UDNR, and USFWS. The Final Implementation Agreement will be subject to agreement by the parties and their respective counsel. Each of the participating cities must enter into a binding interlocal agreement with the County regarding the city's role in the implementation of this HCP. Most of the cities within the County have entered into such agreements. Cities which elect not to execute the interlocal agreement with the County will not be entitled to the benefits of the permit.

CHAPTER 7.0
IMPACT ON SURVIVAL OF LISTED SPECIES

Impacts of the HCP to the following Federally listed species are considered in this chapter: Mojave desert tortoise, bald eagle, peregrine falcon, Mexican spotted owl, southwestern willow flycatcher, woundfin minnow, Virgin River chub, dwarf bear-claw poppy, and Siler pincushion cactus. Impacts to a species are considered throughout its geographic range and to local, individual populations. Each species has been studied to a greater or lesser degree throughout its current and, in some cases, historical range. A summary life history of each species is presented; potential impacts to habitats and individuals are discussed; and measures to maintain, enhance and protect the species are detailed. Priorities for addressing these measures shall be established through the procedure set forth by the HCP.

7.1 MOJAVE DESERT TORTOISE (*GOPHERUS AGASSIZII*)

7.1.1 Description

The Mojave Desert population of the desert tortoise is listed as a threatened species by the USFWS. Desert tortoises are found in several areas of Washington County, and potential habitat for the species includes developable land in the County. The distribution of the desert tortoise, including both Mojave and Sonoran subspecies, extends throughout Arizona, Southern California, Southern Nevada, Southwestern Utah, and into Northern Mexico.

Rapid population decreases, attributed to many factors including an upper respiratory tract disease (URTD), prompted listing of the desert tortoise as a threatened species. The USFWS estimates populations have declined at rates of 10 percent or more per year for the last six to eight years (USFWS 1989). Growth rates calculated for 16 monitoring plots in California, Nevada, and Arizona indicate some local populations may be decreasing by as much as 20 percent a year (Gilpin 1990). The USFWS released the Recovery Plan for the Desert Tortoise (Mojave Population) in August 1994 (USFWS 1994).

An adult desert tortoise has a domed carapace or upper shell and relatively flat plastron or bottom shell. Color of the shell is light to dark brown, with the plastron light brown to buff-colored. The front legs are adapted for burrowing, with laterally extended limbs and flattened feet, enlarged and horny scales, and broad nail-like claws. The rear legs are rounded and elephantine. The head is rounded in the front and has a blunt, horny beak; eyes have greenish irises. Skin, unprotected by horny plates, is thin and easily penetrated. Adult desert tortoises range in size from 9.25 to 14.5 inches long (23.5 to 36.8 cm). Hatchlings are about the size of a silver dollar, 1.4 to 1.8 inches long (36 to 45 mm). Although it has not been possible to verify in the wild, the life span of an adult desert tortoise has been estimated at 50 to 100 years. One captive female desert tortoise lived to be over 80 years old (Glenn 1983). Mortality is highest in young desert tortoises due to their soft shell, and decreases with growth and shell ossification.

To escape extremes of hot and cold during the day and night, desert tortoises rely on burrows and other forms of cover to regulate body heat. They dig by scraping alternately with their front feet. When the hole becomes deep enough, the desert tortoise may turn around and push the dirt out with its forelimbs (Ernst and Barbour 1972). In areas with sandy-loamy soil, a burrow the length of the desert tortoise can be completed in little more than an hour (Marlow 1979). Desert tortoises generally use three types of cover: burrows the approximate width of a desert tortoise and at least as long as the desert tortoise, pallets or soil depressions with no soil cover, and large openings in rock or caliche which can accommodate several desert tortoises.

Burrow construction occurs on flats and sloping bajadas, as well as on the relief provided by wash banks, berms, hillsides, and mountain slopes (Karl 1983). Desert tortoises generally are found in areas where soil is suitable for burrow construction, such as loamy sand. The soil must be sufficiently free from rocks to permit digging and compact enough to maintain a strong archway over the burrow (Woodbury and Hardy 1948).

Desert tortoises are active only during the warmer months of the year, with the greatest amount of activity in the spring. Their active season begins in early March and ends in late October or early November, when they retreat to burrows and usually remain dormant through the winter. Desert tortoises also are relatively inactive during the peak of summer, except during cool spells or storms. Daily activity during their active season is dictated largely by temperature. Desert tortoises are active between ambient temperatures of 65 to 105 degrees Fahrenheit. They are active in the morning shortly after daylight, retreating to burrows when ambient temperatures rise above 105 degrees Fahrenheit, and become active again in the late afternoon. Nocturnal activity is rare.

The diet of desert tortoises is composed mainly of forbs (small annual flowering plants) and annual grasses. These plants generally bloom from March to May and, depending on rainfall, in early fall. Other forage includes perennial grasses, woody shrubs and cacti (Esque et al. 1990).

The characteristics of the habitat occupied by the desert tortoise reflect the species' burrowing and foraging behavior and physiological climatic constraints. Conditions include, but are not limited to, an appropriate mix of vegetation and soils, together with access to seasonal food and water sources. Perennial vegetation is essential to the desert tortoise for cover and also protects some types of annuals found in the understory. The roots of perennials also provide stability to soils, thereby improving the suitability of burrow sites.

Creosote bush is the dominant perennial shrub in the Mojave Desert and is an indicator of desert tortoise habitat (Karl 1983). In Nevada, California, and Utah, desert tortoises are found in low densities in creosote bush-blackbrush ecotones and in creosote bush-saltbush communities, but rarely where creosote bush is entirely absent from the surrounding community.

Desert tortoises are generally found between 1,300 and 4,000 feet elevations, although they have been found as high as 4,800 feet in Nevada (Karl 1983); at 7,000 feet in the Providence Mountains of California; and below mean sea level in Death Valley National Monument.

7.1.2 Potential Impacts to Desert Tortoise

7.1.2.1 Quantitative Impact to the Number of Desert Tortoises and the Quantity of Habitat

To depict accurately what impacts might occur to the Mojave desert tortoise under the terms of this HCP, a worst case scenario would be development of the entire take area during the permit period. The estimated number of desert tortoises in the Upper Virgin River Recovery Unit is 7,883. The proposed take is estimated to be 1,169 animals, which represents almost 16 percent of the total estimated Upper Virgin River Recovery Unit population. In terms of habitat, 12,264 acres will be removed out of a total of 55,947 acres in the Upper Virgin River Recovery Unit, a reduction of approximately 22 percent.

7.1.2.2 Qualitative Assessment of the Effectiveness of the Proposed Reserve

Washington County, in coordination with USFWS and UDWR, has reviewed the criteria for establishing a desert tortoise habitat reserve and designed, to the maximum extent practical, a reserve that is thought to significantly increase the chances of maintaining a viable, self-sustaining population of desert tortoises in the Upper Virgin River Recovery Unit and thereby meet the recovery plan goal. It is very difficult to predict how effective a proposed reserve will be for any target species. Because the future is unknown and existing ecological relationships are poorly understood, any quantitative predictive estimate is speculative. However, to provide guidance to land management agencies in designing reserves which utilize the best current information, the DTRP has identified seven criteria to be considered in reserve design. This section presents these reserve design criteria and evaluates the proposed reserve against these guidelines.

The seven criteria for reserve design are as follows: (USFWS 1994, pp. 62-63)

(1) Reserves that are well distributed across a species' native range will be more successful in preventing extinction than reserves confined to small portions of a species' range.
(2) Large blocks of habitat, containing large populations of the target species, are superior to small blocks of habitat containing small populations.
(3) Blocks of habitat that are close together are better than blocks far apart.
(4) Habitat that occurs in less fragmented, contiguous blocks is preferable to habitat that is fragmented.
(5) Habitat patches that minimize edge to area ratios are superior to those that do not.
(6) Interconnected blocks of habitat are better than isolated blocks, and corridors or linkages function better when the habitat within them is represented by protected, preferred habitat for the target species.

(7) Blocks of habitat that are roadless or otherwise inaccessible to humans are better than roaded and accessible habitat blocks.

The purpose of this section is to examine the biological implications of the proposed Washington County reserve on the Upper Virgin River Recovery Unit of Mojave desert tortoise with respect to these reserve design criteria. In order to accomplish this, an objective evaluation of these factors against the reserve zones is presented. First, a general analysis of the overall reserve against the seven criteria is conducted and then a more specific analysis of each of the zones against the criteria is presented.

7.1.2.3 Overall Analysis

The reserve as described within this HCP is similar to that proposed in the DTRP and meets all of the criteria identified in the DTRP as important (USFWS 1994):

- includes the best examples of desert tortoise habitat in specific vegetation regions;
- provides protection for the ecosystems upon which entire high-density, healthy desert tortoise populations depend;
- includes heterogeneous terrain and vegetation; and
- includes small and isolated healthy populations.

A specific analysis of each of the seven reserve design criteria follows.

(1) Reserves that are well distributed across a species' native range will be more successful in preventing extinction than reserves confined to small portions of a species' range.

While there has been debate as to whether the desert tortoise is native in the St. George area, for purposes of this discussion, it is assumed they are native to the area, although, it is the position of the Commission that they are largely not native to the area. Mojave desert tortoises occur in patches in Washington County. Whereas it is reasonable to assume the desert tortoise might have occurred in more areas prior to development and settlement of this area, it is unknown whether desert tortoises were substantially more abundant than they are today. What currently remains is a contiguous area of occupied Mojave desert tortoise habitat from Ivins to Hurricane, with only a few isolated populations scattered throughout the rest of the Upper Virgin River Recovery Unit. While desert tortoise dispersal between the isolated populations and this primary area is understandable, the habitat connection linking this area with the Beaver Dam Slope is still unknown. In summary, the reserve as designed is well distributed across the desert tortoise's native range in this Recovery Unit, to the extent of our current knowledge and represents the only reasonable potential for establishing a viable reserve in this Recovery Unit.

(2) Large blocks of habitat, containing large populations of the target species, are superior to small blocks of habitat containing small populations.

The densest populations of desert tortoises in the Upper Virgin River Recovery Unit are found in the City Creek area, which is near the center of the proposed reserve. Other desert tortoise population centers are found in the Paradise Canyon area, in the area east of the Cottonwood Road, and in the Hurricane area. Each of these areas is included within the reserve boundaries. Small, isolated blocks of habitat which are either not contiguous with the reserve or impacted by urban development are not included within the reserve boundary. The largest blocks of habitat with the largest and densest desert tortoise populations have been included in the reserve.

(3) Blocks of habitat that are close together are better than blocks far apart.

The reserve boundaries include blocks of habitat that are close together to facilitate dispersal of desert tortoises between habitat patches. In some areas, corridors of habitat have been provided to facilitate dispersal. In one area (at the northwestern corner of the Washington City take area), the corridor connecting two habitat blocks is one-half mile in width, while in areas where roads are present, such as Highway 18, the only type of corridor which will be available is one underground culvert located at Twist Hollow, as both sides of this Highway are proposed for desert tortoise-proof fencing (which may be removed in the future if warranted). Desert tortoise movement within the reserve is further impeded by Interstate 15, providing a barrier between Zones 3 and 4; the Virgin River, providing a barrier between Zones 4 and 5, and the Town of Ivins and a narrow drainage structure between Zones 1 and 2. While there is no empirical data suggesting minimum effective width of a corridor, most biologists agree that bigger is better, and the DTRP suggests that corridors should be the width of at least one home range. While none of these barriers represents a permanent barrier to genetic exchange, some of them may present an obstacle for desert tortoise movement in the short term. Long-term management of dispersal, recolonization, and gene flow may involve physical movement of individual desert tortoises by the management agencies. The evaluation of corridor viability and the need for management intervention will be addressed through monitoring and the reserve management plan.

(4) Habitat that occurs in less fragmented, contiguous blocks is preferable to habitat that is fragmented.

Whereas the reserve does have some man-made and natural obstacles to desert tortoise movement within its boundaries, much habitat within the reserve is contiguous and fragmentation has been minimized to the maximum extent practicable. Because the reserve encompasses all of the known primary habitat blocks in the Upper Virgin River Recovery Unit, there is no way in which fragmentation could be further reduced, or other contiguous blocks included. In addition, the extent of habitat fragmentation will be significantly reduced by proposed management actions (e.g., fencing highways and roads). Further, managed dispersal can reduce the negative genetic consequences of habitat fragmentation if this occurs.

(5) Habitat patches that minimize edge-to-area ratios are superior to those that do not.

Overall, the edge-to-area ratio is similar to that proposed for this DWMA in the DTRP. While the edge-to-area ratio varies substantially between different zones of the reserve (this is discussed in greater detail in the next section), it is not as high as it could have been under different reserve designs. This design takes into account the practical reality of existing topography, development, and availability of land.

(6) Interconnected blocks of habitat are better than isolated blocks, and corridors or linkages function better when the habitat within them is represented by protected, preferred habitat for the target species.

The entire reserve represents interconnected blocks of habitat, and all corridors and linkages represent existing habitat for the species. As mentioned in the DTRP, a result of this criteria is that the spread of infectious diseases like URTD is not obstructed. However, the DTRP states that once URTD has run its course, the advantage of dispersal may outweigh any disadvantages (USFWS 1994). The only significant man-made barriers fragmenting the reserve are roads and the Virgin River. Many of these roads will be fenced to minimize desert tortoise mortality and culverts underneath these roads should facilitate desert tortoise movement and mitigate potential barriers.

(7) Blocks of habitat that are roadless or otherwise inaccessible to humans are better than roaded and accessible habitat blocks.

Unfortunately, there are few roadless areas of any size within desert tortoise habitat in the Upper Virgin River Recovery Unit. To the maximum extent practicable, interior roads will be closed within the reserve boundaries. Paved highways such as Interstate 15, Highway 18, Snow Canyon Road, and Skyline Drive will remain open to vehicular traffic. Desert tortoise mortality along Highway 18, Interstate 15, and Skyline Drive will be minimized through fencing. The largest block of habitat which will remain roadless is within Zone 3 of the reserve which is between the Cottonwood Road, Interstate 15, the Dixie National Forest, and Red Cliffs, an area of approximately 28,147 acres. The next largest block is also within Zone 3, and it is between Highway 18 and the Cottonwood Road north of Skyline Drive, an area of approximately 10,155 acres. These two blocks would constitute an almost roadless reserve area if the Cottonwood Road was gated and only local traffic allowed. Another roadless area will exist in Zone 2, west of Highway 18 to Snow Canyon Road, an area of approximately 3,675 acres. An area of 758 acres near Hurricane (Zone 5) will be roadless. The closing, gating, and fencing of roads and installation of culverts for dispersal greatly reduces the extent of habitat fragmentation caused by roads and significantly enhances the viability of the reserve.

7.1.2.4 Zone Analysis

Desert tortoise habitat by varying densities and land ownership within the proposed reserve is presented in Table 7.1. Low-density habitat carries 25 desert tortoises per square mile;

medium-density habitat carries 75 desert tortoises per square mile; and high-density habitat carries 250 desert tortoises per square mile.

Zone 1. Zone 1 is the area between the Town of Ivins and the Paiute Indian Tribal Lands. It contains approximately 1,374 acres of desert tortoise habitat, with an estimated desert tortoise population of 77 animals. Development in this area is low density with maintenance of native vegetation. An undeveloped strip of varying width exists at the base of the cliffs, within which desert tortoises may persist. This may provide for movement and genetic exchange between desert tortoise populations on the Indian Tribal Lands and those to the east of Ivins. Because this area will be occupied by human habitation, none of the reserve design criteria directly apply. However, it is the opinion of the TAC that this proposed treatment is appropriate here because it is located on the fringe of desert tortoise habitat in this Recovery Unit, the potential ability for genetic exchange is maintained, and the nature of already completed development here might allow desert tortoise movement and maintenance of home ranges.

Table 7.1. Zone by Zone Analysis of the Reserve

Landowner/ Habitat Density	Zone 1 (acres)	Zone 2 (acres)	Zone 3 (acres)	Zone 4 (acres)	Zone 5 (acres)
Private					
None	15	143	411	0	34
Low	732	367	488	0	142
Medium	44	0	835	0	156
High	0	738	3,256	0	257
Total	791	1,248	4,990	0	589
State					
None	0	62	782	0	0
Low	0	475	2,882	0	0
Medium	0	0	2,501	0	0
High	0	474	3,762	0	0
Total	0	1011	9,927	0	0
BLM					
None	4,757	3,294	10,601	655	29
Low	337	320	7,427	4,488	49
Medium	261	0	1,553	48	51
High	0	173	3,990	0	1
Total	5,355	3,787	23,571	5,191	130
Snow Canyon S.P.					
None	0	1,380	53	0	0
Low	0	2,742	0	0	0
Medium	0	0	0	0	0
High	0	204	0	0	0
Total	0	4,326	53	0	0
Grand Total	6,146	10,372	38,541	5,191	719

Zone 2. Zone 2 represents an area which contains a large number of desert tortoises in some high quality habitats. It contains approximately 5,493 acres of desert tortoise habitat, with an estimated desert tortoise population of 773 animals. Zone 2 presents two problems when analyzed using the reserve design criteria. The first is that it is crossed by two roads: The Tuacahn Road and Snow Canyon Road. The second problem is that the amount of habitat protected within Zone 2 west of Snow Canyon Road is approximately ¼ mile in width. This corridor will be defined by a cliff and fencing to the north and a desert tortoise proof fence to the south. While ¼ mile of undisturbed open space is certainly sufficient to allow for genetic exchange over the long term, its size may be inadequate to provide for the entirety of a home range for an adult desert tortoise. This area may require a higher level of management, such as the physical movement of individual desert tortoises, to enhance dispersal and gene flow. This issue will be addressed in the reserve management plan for this area.

On its eastern edge, Zone 2 is bounded by Highway 18, which is slated to be desert tortoise-proof fenced on both sides. Desert tortoise fencing is considered essential to minimize direct mortality of desert tortoises along the highway; however, it might restrict all movement and genetic exchange. Only one culvert exists underneath Highway 18 at Twist Hollow and desert tortoise use of this culvert has not been documented. In summary, Zone 2's reserve design problems focus around animal movement within the Zone, and between Zones 1, 2, and 3. This problem will be addressed through management of gene flow with culverts or assisted dispersal and elimination of road traffic mortality. The other aspect of Zone 2 which might improve its reserve design would be to widen the ¼ mile corridor west of Snow Canyon Road. However, to the west of this narrow corridor is an even narrower corridor. Between the Town of Ivins and the base of the Red Hill is a 25-foot wide strip which cannot practically be widened. So, although the ¼ mile corridor may be a restriction, an even greater restriction occurs slightly to the west. Zone 2 represents a practical compromise between current conditions and what biologically might be optimum for desert tortoise well-being. Some might argue that Zone 2 should not be a reserve at all, given these inherent reserve design constraints. However, including this area in the reserve provides protection for a substantial block of habitat and provides a corridor for a variety of other special-interest species. For these reasons, it is better to include this area in the reserve. even with its current problems.

Zone 3. Zone 3 represents a contiguous block of habitat between Highway 18 and Interstate 15, and substantially meets all of the reserve design criteria. It is a large, contiguous block with 26,694 acres of desert tortoise habitat and an estimated 5,295 desert tortoises occupying high quality habitat connected by lower-density corridors. However, there are two potential obstructions to the contiguity of habitat within Zone 3. The first is the Cottonwood Road, which does not receive much traffic. As this is a high-density area, many desert tortoises cross the road and forage along the roadside. This road will be gated or fenced. thus minimizing conflicts between roadway use and desert tortoises. The second possible obstruction is a one-half mile wide corridor at the northwest portion of the Washington City Take Area. This corridor will lie between eventual fenced development and a cliff. This corridor is considered to be adequate to maintain unimpeded desert tortoise

movement and genetic exchange. Difficulties in desert tortoise movement between Zone 3 and Zone 2 have been discussed previously. Within Zone 3, the existing use of the Turkey Farm is expected to continue, although all other private property around this farm will be acquired into the reserve. Its continued use is expected to have little impact on desert tortoise populations. The eastern boundary to Zone 3 will be a private property line which will be fenced to reduce negative impacts on the reserve. The TAC has maintained that the eastern reserve boundary should be the Red Cliffs Road rather than the private property boundary, as it is believed that the road represents a more manageable boundary. Changing the boundary from the property line to the road would add approximately 160 acres of desert tortoise habitat to Zone 3. The boundary was left at the property line due to conflicts with the landowner. It is unlikely that a substantial adverse impact or benefit would occur to desert tortoise in Zone 3 as a result of either boundary line, assuming appropriate fencing and law enforcement.

Zone 4. Zone 4 includes approximately 5,191 acres of BLM land and six privately-held acres east of Interstate 15 and north of the Virgin River. To date, live desert tortoises have not been found in this area, although it does appear to contain potentially suitable habitat. Zone 4, as currently depicted, violates reserve design criteria because it apparently lacks the target species, as well as having a number of inholdings substantially increasing the edge to area ratio. Zone 4 has been included within the reserve boundaries as a potential area for translocation of desert tortoises removed from the take areas. Therefore the reserve design criteria would only logically apply to the actual area planned for translocation, which would likely be a small, contiguous block of BLM land on the order of one or two square miles. This area is preferable for translocation for the very reasons that it violates an important reserve design criteria: it is isolated from Zone 3 by Interstate 15 and from Zone 5 by the Virgin River and it does not currently appear to contain desert tortoises. Should translocation succeed and a new population is established here, then the overall viability of the Recovery Unit will be enhanced.

Zone 5. Zone 5 is an area of 656 acres of desert tortoise habitat wedged between the Virgin River and the city of Hurricane. It is estimated to contain 133 desert tortoises. There are two cinder knolls in Zone 5, and much of the highest quality habitats are found on and adjacent to these knolls. Zone 5 represents a contiguous, non-fragmented block of habitat; however, there is concern due to its small size. Whereas the DTRP suggests (USFWS 1994) that small, isolated populations should be included as they may be valuable in reducing potential catastrophic effects of URTD or other diseases, the concern for Zone 5 is that it may be too small. While there are no empirical data to suggest a minimum viable population size, the TAC has expressed concern that this zone is likely too small for long-term survival of this population. Biologists examining Zone 5 would prefer a larger reserve area; however, given current land uses, the entire Zone is constrained on all sides. There was a disagreement over 300 acres adjacent to the western boundary of Zone 5, as its deletion from this Zone may have reduced the Zone's viability as a reserve. This deletion represents a decrease in size of almost 30 percent. As stated earlier, there are no data to indicate whether the Zone as currently configured, or the Zone with this 300-acre area

included, is sufficient over the long term. Accordingly, this area will require a higher level of management and this will be addressed in the reserve management plan.

7.1.3 Desert Tortoise Habitat Maintenance, Enhancement, and Protection

Desert tortoise habitat in Washington County will be significantly enhanced by a combination of reserve establishment, habitat acquisition, habitat protection, and long-term species management. The proposed reserve will include the vast majority of high- and medium-density desert tortoise habitat in the Upper Virgin River DWMA. It will be connected with lower-density habitats for movement corridors and foraging areas which should result in permanent protection of desert tortoise populations in the Upper Virgin River DWMA. Land acquisition between the State of Utah, private individuals and the BLM through exchanges and purchases will ensure the contiguity of desert tortoise habitat. The DTRP has assigned threat ratings to each of the 14 DWMAs on a scale of 1 to 5, with 5 being the highest. The Upper Virgin River DWMA has a threat rating of 5 because of conflicts with development. Although the total amount of desert tortoise habitat in the North St. George area will be reduced as a result of incidental take, development threats to the population should be virtually eliminated as a result of this plan. Exchanging these lands to the BLM removes the development potential and fencing the reserve protects these lands from adverse urban impacts such as OHVs, dogs, and equestrian uses. Grazing permits within the reserve will be purchased and retired by the HCP to eliminate potential conflicts between desert tortoises and livestock. Public use of the area will be restricted to the extent necessary, and law enforcement personnel will conduct regular patrols. Most reserve boundaries will be fenced to minimize human impacts to the desert tortoises. Therefore the incidental take in the Upper Virgin River Recovery Unit should not adversely impact the continued existence of the desert tortoise in the area, and, in fact, implementation of the HCP should substantially enhance the long-term survival of the desert tortoise in this Recovery Unit. Further, without this plan there is very little prospect for long-term survival or recovery of desert tortoise populations in this Recovery Unit.

7.2 BALD EAGLE (*HALIAEETUS LEUCOCEPHALUS*)

7.2.1 Description

The bald eagle recently has been downlisted by the USFWS to a threatened species. Most observations of bald eagles are along the Virgin River, Santa Clara River, and bodies of water associated with these rivers. Other use areas include Quail Creek reservoir, Hurricane sewer ponds, Baker Dam reservoir, Sand Cove reservoirs, Gunlock reservoir, Ivins reservoir and Ash Creek reservoir (BLM 1990, Jensen 1991).

Adult bald eagles have a white tail, tail coverts, throat, chin, nape and head. The rest of the body is dark brown to black, with mostly yellow eyes. Juveniles are marked by brown rather than white feathering on the head and tail, while subadults (2–4 years old) have mottled white and brown head and tail feathers. These eagles are noted for their size, with adult bird wingspans ranging from 45 to 55 inches (114–140 cm). Bald eagles are found

from the Bering Strait south to Florida and Baja, Mexico, preferring areas where fish (their primary food) is abundant, including coasts and inland waterways (Johnsgard 1990).

Winter concentrations require the presence of suitable roosting sites as well as food supplies. In Utah, bald eagles favor side canyons with bowl-shaped ravines offering environmental protection, and selectively perch in large and open trees located near the tops of ridges, thereby allowing easy access to valleys (Edwards 1969). Bald eagles mature rather slowly for bird species, not attaining breeding maturity until their fourth or fifth year. Most studies show bald eagles mate for life, commonly nesting in the same location for many years.

7.2.2 Potential Impacts to Bald Eagle

Current impacts to the bald eagle in Washington County include increased recreational use of the reservoirs where the eagles winter and OHV use in mammalian forage areas. The number of bald eagles wintering in Washington County varies from year to year, based upon climate, reproductive success and forage availability. Impacts of the HCP to the bald eagle will be indirect, such as development of areas serving as foraging grounds and water development projects occurring to meet growth anticipated by the HCP. Land which can be developed in the permit area will not include any habitat used by bald eagles for roosting. Known roosting sites within one mile of take areas include Ivins reservoir, the City of Hurricane sewer ponds, and the Virgin and Santa Clara Rivers. It is anticipated that the primary food base of the eagles, medium to large-sized fish, will not be affected by implementation of this plan.

7.2.3 Bald Eagle Habitat Maintenance, Enhancement, and Protection

This HCP does not provide specific habitat enhancement measures for the bald eagle, as impacts in Washington County are expected to be insignificant. However, the HCP has allocated almost two million dollars for other species concerns, which could be used for habitat maintenance, enhancement, and protection for bald eagle should a project be identified.

7.3 PEREGRINE FALCON (*FALCO PEREGRINUS*)

7.3.1 Description

The peregrine falcon is currently listed as an endangered species by the USFWS. It was listed as endangered in 1970 (35 *FR* 16047) because DDT and its metabolites were having a direct impact on the falcon's survival. Subsequent banning of DDT and institution of protective measures has resulted in apparent recovery of the species. Peregrine falcons are now known to be present in numbers greater than the goal postulated in the Recovery Plan (Skaggs et al. 1988), and it is possible that the species may be delisted.

Known nesting sites in Washington County include approximately 12 nest sites in Zion National Park, one at Welcome Spring near the south end of the Beaver Dam Mountains, and one at Red Cliffs Recreation Area (Jensen 1991). Only the nesting site at Red Cliffs is near enough to the project area to be considered potentially impacted by implementation of this plan, and specifically, development along the Red Cliffs Road. It is important to note that this eyrie is adjacent to the Red Cliffs Recreation Area, an area managed by the BLM which receives a substantial amount of recreational use.

Peregrine falcons are large, quick, specialized raptors which roost and nest on steep cliffs and feed primarily upon smaller birds. Peregrines fly with extreme power and speed, often attacking their prey with a vertical dive from great heights, as well as sometimes engaging in direct pursuit. A typical adult has a black head, white cheek and throat, and a readily distinguishable wide, dark mustache mark. Back and upperwing coverts are dark slate with blue-gray bars and feather fringing; uppertail coverts are blue-gray with black barring. The white belly is barred with black. White leg feathers have black barring; the tail is back with eight or more gray bands and a thick white terminal band (Clark and Wheeler 1987).

Peregrine falcons are found from Alaska south throughout the western United States to southern Baja, Mexico. In the Southwest, Breeding sites are generally associated with high sheer cliffs at least 250 feet in height at an altitude between 4,000 and 7,000 feet. A source of water (river, lake, marsh, etc.) is almost always close to the nest site, probably in conjunction with a localized and adequate prey base of small to medium-sized birds (or sometimes mammals), which is the other major habitat need (Johnsgard 1990).

7.3.2 Potential Impacts to Peregrine Falcon

Falcon eyries at Welcome Spring and in Zion National Park will not be impacted by implementation of the HCP because of their distance from proposed development areas. The eyrie at the Red Cliffs Recreation Area lies within the reserve area. Prime hunting habitat for the falcons at this eyrie includes areas protected within the reserve, where populations of the small birds provide forage for the falcons. If the private lands along the road below the eyrie were to develop more substantially, human activities in the area may increase. Indirect effects of increased development of the general area may be either positive or negative. Positive indirect effects expected would include an increase of food resources for peregrine falcons.

Adverse indirect effects might include increased recreational use of the the areas outside the reserve and to the north (i.e., Red Cliffs Recreation Area). However increased use of the Red Cliffs Recreation Area may be unrelated to whether the private lands along the road are developed. It remains unclear what overall net indirect effects will occur by implementing the HCP, but it is clear that the reserve enhances the protection of the falcons.

7.3.3 Peregrine Falcon Habitat Maintenance, Enhancement, and Protection

Increased protection to the eyrie at Red Cliffs is expected due to reserve establishment. Other potential eyrie sites will also be protected within the reserve boundaries, such as those in Paradise Canyon and along the cliffs on the Virgin River west of Hurricane.

The HCP administrator and or county biologist will monitor the Red Cliffs nest on a periodic basis to determine reproductive status and the effect, if any, human intrusion from outside the reserve, may be having on the nest. This will include monitoring impacts arising from activities on or associated with the BLM Red Cliffs recreation area. In the unlikely event of take, discussion will concurrently occur with the USFWS, UDWR, BLM, and the County and any additional managment actions necessary will be identified.

7.4 MEXICAN SPOTTED OWL (*STRIX OCCIDENTALIS LUCIDA*)

7.4.1 Description

The Mexican spotted owl was listed as a threatened species by the USFWS in March 1993. The Mexican spotted owl was listed in response to apparent threats by human impacts to species survival. Its range includes portions of Utah, Arizona, New Mexico, and Colorado. While they utilize a variety of habitats in southern Arizona and New Mexico—including mixed-conifer forests and steep canyons—in southern Utah, nesting presence has only been confirmed in canyon habitat or canyon/mesa topography (Willey 1991, Gutierrez and Rinkevich 1991, Rinkevich 1991, SWCA 1992, Ligon 1926, Kertell 1977). Elsewhere along its range the species is associated with canyons and north-facing slopes.

Eleven Mexican spotted owl mating pairs and three individuals are found in Zion National Park, and sightings have been recorded from northern Washington County on BLM lands near Zion National Park (pers. comm., S. Rinkevich [USFWS], 1992; pers. comm., R. Douglas [BLM], 1992). Survey results on the Dixie National Forest indicate that although a spotted owl was detected in the Cedar City Ranger District, no owl locations were confirmed.

7.4.2 Impacts to Mexican Spotted Owls

No potential habitat for Mexican spotted owls exists within the proposed development and reserve areas under this Plan. The only known habitat for this bird in Washington County is in Zion National Park. Potential habitat for Mexican spotted owl may exist in the Dixie National Forest. It is anticipated there will be no impacts to Mexican spotted owls or their habitat under this HCP.

7.4.3 Mexican Spotted Owl Habitat Maintenance, Enhancement, and Protection

No habitat maintenance, enhancement, or protective measures are specifically included within the HCP. However, monies are available from the 'other species' budget should high-priority projects for the Mexican spotted owl be identified.

7.5 SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRAILLII EXTIMUS*)

7.5.1 Description

The southwestern willow flycatcher was listed as endangered in March 1995. It is a State sensitive species. This flycatcher uses low to mid elevation and stream habitats, generally nesting among willow or reed thickets, but inhabiting forests, wetlands, and rangeland during other parts of the year. It feeds upon insects, berries, and seeds and winters from southern Mexico to Panama (Ehrlich et al. 1988). Southwestern willow flycatchers have been recorded along the Virgin and Santa Clara Rivers. While habitat with vegetation similar to that in known breeding areas exists along these waterways, no breeding populations or nests have been documented (pers. comm., R. Fridell [UDWR], 1992). However, summer records of this species imply the possibility of breeding in these areas.

7.5.2 Impacts to Southwestern Willow Flycatchers

The HCP should not impact waterways or riparian habitats. The effects of water development associated with increased land development on willow flycatchers are unknown. It may alter existing riparian areas adversely impacting suitable habitat. Conversely, it could create larger zones of suitable habitat along reservoir edges.

7.5.3 Southwestern Willow Flycatcher Habitat Maintenance, Enhancement, and Protection

It would be useful to conduct a comprehensive inventory of distribution and status needs to be conducted for this species, as it has been 5–6 years since the last surveys were conducted for this species in Washington County (pers. comm., S. Hedges [BLM-Cedar City], 1992). Additionally, the protection and enhancement of riparian areas, particularly along the Virgin and Santa Clara Rivers, may be beneficial to the species. This could possibly mean purchasing grazing permits along the rivers. Cattle grazing not only directly impacts this species and habitat (trampling and eating willows and riparian vegetation, knocking down nests that are situated low to the ground) but also indirectly impacts this species by attracting brown-headed cowbirds which parasitize their nests.

7.6 WOUNDFIN (*PLAGOPTERUS ARGENTISSIMUS*) AND VIRGIN RIVER CHUB (*GILA ROBUSTA SEMINUDA*) *(These two species are being considered together due to their similarity of habitat and impacts.)*

7.6.1 Description

Woundfin are listed as an endangered species by the USFWS. Woundfins prefer runs and quiet waters adjacent to shallow riffles with a depth of less than 20 inches (0.5 meters) and sand or gravel bottoms. They are found in the mainstream of the Virgin River from Lake Mead upstream to La Verkin Creek (USFWS 1991).

The woundfin historically was found throughout several tributaries of the Lower Colorado River and the mainstem. It was historically found near the confluence of the Salt and Verde Rivers to the mouth of the Gila River near Yuma, Arizona (Gilbert and Scofield 1898). With impoundment, introduction of non-native fishes, water depletions, and overall habitat loss, the woundfin has been diminished so that it is found in the mainstem of the Virgin River only in northeastern Nevada and southwestern Utah (Miller and Hubbs 1960, Minckley and Deacon 1968). The species has declined dramatically in the last decade (USFWS 1991), and critically low population levels have been monitored in recent years by the Virgin River Fishes Recovery Team (USFWS, unpublished data). Presently, the woundfin is occasionally found below the Washington Fields Diversion, Utah, but is most abundant above this withdrawal structure. All attempts to re-establish this fish in other parts of its native range have failed (Arizona Game and Fish, unpublished data). The Virgin River Fishes Recovery Plan (USFWS 1995) identifies limiting factors for the woundfin, Virgin River chub, and other native fish species as the loss of habitat and the introduction and establishment of nonnative fish, particularly the red shiner. Loss and degradation of habitat has occurred through the building of dams and associated reservoirs, water diversion structures, canals, laterals, aqueducts, and the dewatering of streams. The decline in both species' range and population numbers is due to the physical reduction in available habitats within the various river systems caused by these water projects. This loss of habitat has been exacerbated due to the introduction and establishment of exotic species, further reducing the suitability of remaining habitats for woundfin and Virgin River chub.

The Virgin River chub is currently listed as an endangered species by the USFWS. Within its habitat, this species is most common in deeper areas where water is swift but not turbulent, and is generally associated with boulders or other cover (Hardy et al.1989). Individuals generally are found over sand or gravel substrates in water with temperatures less than 90 degrees fahrenheit (32 degrees celsius), and is very tolerant to high salinity and turbidity. Present distribution of the Virgin River chub includes the mainstream of the Virgin River from Lake Mead upstream to La Verkin Springs, near the town of Hurricane, Utah.

The Virgin River chub historically inhabited the entire Virgin River upstream to La Verkin Springs near Hurricane, Utah (Cope and Yarrow 1875). The species now inhabits less than half of its original range in areas of perennial flow and usually composes less than five

percent of the fish community. Not more than a few individuals have been collected below the Mesquite Diversion, in Arizona, since the late 1970s (USFWS, unpublished data).

7.6.2 Potential Impacts to Woundfin and Virgin River Chub

It is anticipated there will be no adverse impacts to the population of woundfin and Virgin River chub in Washington County, thus producing no additional threats to the survival of these species. Several development areas exist near or adjacent to these rivers, but development activities are not expected to have a negative impact on waterborne insects, the primary food base of these fishes. Growth and development of Washington County will put additional demands on the water supply of the area, thus potentially affecting the flow of the Virgin River. Although there are conflicting opinions on the effect groundwater pumping has on the flow of the Virgin River, these potential impacts are not considered a result of implementation because the HCP is primarily concerned with where growth could occur. not whether growth can occur. This is further analyzed in the accompanying NEPA document. Further, development of additional water supplies is subject to its own environmental analyses and consultations with the USFWS.

7.6.3 Woundfin and Virgin River Chub Habitat Maintenance, Enhancement, and Protection

The Virgin River Fishes Recovery Plan (USFWS 1992) has numerous recommendations for recovery of these species. Monies could be made available from the other species budget for these projects. The proposed Virgin River Basin Integrated Resource Management and Recovery Plan will also address actions to help protect these and other riparian species. It is outlined in greater detail in Chapter 9.

7.7 DWARF BEAR-CLAW POPPY (*ARCTOMECON HUMILIS*)

7.7.1 Description

The dwarf bear-claw poppy is listed as an endangered species by the USFWS. It is restricted to the Shinarump Formation and the upper members of the Moenkopi Formation. It has also been described as being found on rolling low hills and bluffs in warm, open desert scrub communities (Utah TES plant guide 1991). This plant seems to be restricted to an elevation range of 2,700 feet to 3,300 feet, with most plants occurring from 2,800 to 3000 feet (USFWS 1985, Utah TES plant guide 1991).

This poppy is known only from Washington County, Utah (Welsh and Chatterley 1985). Bands of Moenkopi Formation around St. George correspond to the preferred elevational range for this plant. Dwarf bear-claw poppy distribution is apparently limited to an area north of the Arizona State line, west of Warner Valley, east of the Beaver Dam Mountains, and south of the Santa Clara River and the portion of the Virgin River running east of St. George (USFWS 1985). Legal locations given for this plant in Washington County are Township 43 South, Range 17 West; Township 42 South, Range 15 West; Township 43

South, Range 15 West; and Township 43 South, Range 16 West (Welsh and Chatterley 1985).

7.7.2 Potential Impacts to Dwarf Bear-Claw Poppy

The dwarf bear-claw poppy does not occur in areas designated for incidental take. However, continuing adverse impacts are occurring to this species primarily due to off-highway vehicle activity. Commercial and residential development and associated road construction could potentially impact this species due to fragmentation and loss of habitat.

7.7.3 Dwarf Bear-Claw Poppy Habitat Maintenance, Enhancement, and Protection

The current population of dwarf bear-claw poppy in Washington County will be substantially improved when fencing and law enforcement assistance is provided by the HCP. Further, implementation by the BLM of the proposed management prescriptions contained within this document would further stabilize and enhance this endangered species.

7.8 SILER PINCUSHION CACTUS (*PEDIOCACTUS SILERI*)

7.8.1 Description

The Siler pincushion cactus, recently downlisted from endangered to threatened by the USFWS, is found on the various members of the Moenkopi Formation. It is sometimes found on the Shinarump, Chinle, and Kaibab Formations, above and below the Moenkopi. The known elevational range of this plant is from 2,800 to 5,400 feet (USFWS 1986, Utah TES plant guide 1991).

The known geographic distribution of the Siler pincushion cactus extends approximately three miles north into Utah in Washington and Kane Counties and about 22 miles south into Arizona in Mojave County (Gierisch 1980). An exposure of Moenkopi on the east end of Warner Valley contains this cactus (USFWS 1986). Legal locations given for this plant in Washington County are Township 43 South, Range 15 West; Township 43 South, Range 11 West; and Township 43 South, Range 14 West (Welsh and Chatterley 1985).

7.8.2 Potential Impacts to Siler Pincushion Cactus

Although this species has currently been downlisted to threatened, adverse impacts continue to occur to its habitat. As in the case of the bear-claw poppy, however, incidental take is not being requested for areas in which the species occurs.

7.8.3 Siler Pincushion Cactus Habitat Maintenance, Enhancement, and Protection

Same as for dwarf bear-claw poppy.

CHAPTER 8.0
CANDIDATE AND STATE SENSITIVE SPECIES

8.1 INTRODUCTION

Washington County supports 38 candidates currently under consideration by the USFWS for listing as threatened or endangered species, as well as an additional 19 species which are only State-listed. Six of these species are considered quite likely to be Federally listed during the permit period. The purpose of this chapter is to provide an overview of these Federal candidate and State sensitive species. For each species, information is presented regarding the species status on State and Federal lists, habitat requirements, known or suspected locations in Washington County, and potential impacts to the species related to implementation of the HCP. Lastly, proposed management recommendations (PMR) for each species are provided. The proposed recommendations are tentative and will be updated based on the availability of additional biological information. Priorities and recommendations for candidate species funding will be formulated by the TC in the first year following permit issuance. This report will be reviewed by the HCAC and ultimately approved by the Commission. Programs identified within the report will be included in annual work plans as expenditures of the other species budget. Efforts will concentrate on broad-based activities benefitting communities and ecosystems and proactive actions alleviating the need for listing or resulting in a lower priority listing of candidate species.

8.2 SPECIES OVERVIEW

8.2.1 Species which may be Listed as Threatened or Endangered within the Foreseeable Future

Virgin Spinedace (*Lepidomeda mollispinis mollispinis*)

Status: Federal: Proposed Threatened, likely to be downlisted to Category 3c
State: Endangered

Range: Virgin River, Santa Clara River, Beaver Dam Wash

Habitat: Preferred feeding areas are in slower pools or riffles. Not found on sandy bottoms, but usually on a more solid substrate. It is hypothesized the spinedace use clear water tributaries when the mainstream is turbulent and clouded. Feeds primarily on aquatic insects.

Locations: Found in the upper reaches of the Virgin River below Zion Canyon Narrows and nine of its tributaries, including Santa Clara River, Beaver Dam Wash, Ash Creek, La Verkin Creek, North Creek, North Fork Virgin River, and East Fork Virgin River (and Shunes Creek). Valdez et al. (1991) reported that the original range had decreased by 40 percent, and that existing and impending water developments, water degradation, and non-native species threaten to further reduce the abundance and distribution of the fish. Of thirteen known populations, none are considered secure, three are considered strong with existing threats, six are declining with persistent threats, and one (Santa Clara River) is rapidly declining and in

danger of extirpation. Populations in Magotsu Creek, Quail Creek, and Leeds Creek are extirpated (Valdez et al. 1991).

HCP Impacts: Similar to woundfin and Virgin River chub

PMR: Follow guidance provided by Valdez et al. (1991), and by the Washington County Water Conservancy District and the UDWR in their draft report on the status and distribution of the Virgin spinedace. The recently signed Conservation Agreement and Strategy on the Virgin spinedace calls for seven actions: establish existing conditions as a baseline; re-establish population maintenance flows; enhance and maintain habitat; selectively control non-indigenous fish; maintain genetic viability; monitor populations and habitat; and develop a mitigation plan and protocol for future activities.

Spotted Bat (*Euderma maculatum*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Southwestern United States

Habitat: Preferred habitat for this species remains somewhat unclear, but is thought to include uneven rocky cliffs within a mile of riparian areas (Findley et al. 1975) and related to water availability (pers. comm., R. Fridell [UDWR], 1992).

Locations: Seven spotted bats were netted in 1974 and 1975 along Fort Pierce Wash, approximately 13 kilometers southeast of St. George (Ruffner et al. 1979). Spotted bats were again netted in August 1992 (pers. comm., R. Fridell [UDWR], 1992). Bats were found in a riparian area with creosote bush, mesquite, tamarisk, and desert willow (Ruffner et al. 1979).

HCP Impacts: The Fort Pierce Wash area is primarily owned by BLM with some isolated parcels of State trust lands not considered developable during the timeframe of the HCP. No development is anticipated in this area within the permit period due to its isolation, lack of water, and apparently undevelopable mineral resources. It is anticipated that the population of spotted bats along Fort Pierce Wash will be unaffected by the HCP.

PMR: Due to the elusive nature of this species, not much information has been gathered. Additional surveys should be conducted to determine such things as what limiting factors have affected its success, what can be done to ensure its survivability, to determine whether previous surveys were done appropriately, and how far away from water can roosts be located.

Shem Milk-vetch (*Astragalus eremiticus* var. *ampullarioides*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Washington County, Utah

Habitat: Endemic to the Chinle formation in scattered juniper and desertscrub communities at 3,450 feet (Utah TES plant guide 1991). This very rare species is highly restricted and only found in locations where human

impacts are already present (pers. comm, K. Harper, [BYU Dept. of Botany], 1992).

Locations: Endemic to the shem area in the southwest corner of Washington County, Utah (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: A plant reserve should be set aside for this species.

Holmgren Milk-vetch (*Astragalus holmgrenorium*)

Status: Federal: Category 1
State: Sensitive (S1)

Range: Washington County, Utah; Mojave County, Arizona

Habitat: Warm Desert Scrub communities at approximately 2,690 to 2,780 feet elevation. (Utah TES plant guide 1991).

Locations: Habitat area is approximately six miles southwest of St. George, in all or parts of Township 43 South; Range 16 West; Sections 22, 27, 26, 33, and 34 (BLM, St. George Office). A Virgin-Mojave endemic (Utah TES plant guide 1991).

HCP Impacts: This species is highly restricted and only found in locations where human impacts are already present (i.e., along 1-15, near a water well that pumps water for cattle grazing, as well as along the proposed alignment for a transmission line). It is possible this species is a young endemic and therefore highly restricted to a geologic formation because it has not been around long enough to broaden its range. However, it is not extremely reproductive. Dr. Harper (a botanist at BYU) noted that recent studies show only 10 percent of potential ovules were fertilized and also their very hard seed coat needs to be scarified before germination can occur. Dr. Harper feels that any proposed project that would alter water flow patterns within this species range would have a detrimental impact on the survival of this species. However, Dr. Stanley Welsh Stated that he cannot see any threat because he foresees no development occurring in this area and any conservation measures would only be an exercise in futility. Areas in which the species is found are primarily owned by the BLM and not planned for development. Current grazing and other multiple use management activities will continue on these lands, with an undetermined effect on populations of Holmgren milk-vetch.

PMR: The primary population of Holmgren milk-vetch lies in several sections at Township 43 South, Range 16 West (Red Bluff), within similar habitat areas as other endangered plants. The development of a plant reserve would benefit this species, as well as restricting and/or eliminating OHV and grazing use on these habitats. A listing package for this species has been prepared by the USFWS.

Wet Rock Physa (Zion Canyon Snail) (*Physella zionis*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Virgin River in Zion National Park

Habitat: This snail is found along seeplines, canyons, and hanging gardens. As an algal feeder, it relies upon permanent though often very small water sources.

Locations: Found from the North Fork of the Virgin River south to the Gateway to the Narrows Trail, in Orderville Canyon, and in isolated hanging gardens, south through Zion National Park.

HCP Impacts: The Zion Canyon snail is known to occur only in Zion National Park. Protected not only by its affinity for hanging gardens on sheer cliff walls but also by the regulations of the National Park Service, the current population of these snails is not expected to be affected by this HCP.

PMR: None at this time.

Bonneville Cutthroat Trout (*Oncorhynchus clarki utah*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Rivers and watersheds of southwest Utah

Habitat: The Bonneville cutthroat trout prefers clear, cold streams and lakes; generally found near the headwaters of river systems where they find the best quality food insects.

Locations: Found in the headwaters of the Virgin River (Deacon et al. 1987).

HCP Impacts: None expected.

PMR: None at this time.

8.2.2 Other Species

8.2.2.1 Mammals

Merriam's Kangaroo Rat (*Dipodomys merriami frenatus*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Southwestern Utah, southern Nevada, southern California, and the southern and western parts of Arizona.

Habitat: Preferred habitat for this species includes sagebrush and saltbush/creosote rangeland as well as transitional areas and sandy areas other than beaches. This species feeds mostly on seeds but on green vegetation as well (Burt and Grossenheider 1976).

Locations: Merriam's kangaroo rats have been recorded on the Beaver Dam Slope and in areas just north of St. George (pers. comm., R. Fridell [UDWR], 1992).

HCP Impacts: Habitat exists within the proposed reserve boundaries for this species.

PMR: Surveys are needed to determine status in Washington County.

Pygmy Rabbit (*Brachylagus idahoensis*)

Status: Federal: Category 2
State: None

Range: Utah, Nevada, Idaho, Oregon

Habitat: The pygmy rabbit is nocturnal and crepuscular, living in simple burrows and seldom traveling more than 30 yards of burrow or other home site. Lives in tall sagebrush growing in clumps (Burt and Grossenheider 1976). They live in burrows, with trenchlike trails radiating out from the burrow.

Locations: The pygmy rabbit has been reported from 10 miles SW of Cedar City, Iron County, Utah. In 1993, pygmy rabbits were recorded at three sites within Washington County (pers. comm., R. Fridell [UDWR], 1992).

HCP Impacts: Habitat may exist within the proposed reserve for this species.

PMR: Surveys are needed to determine status in Washington County.

Virgin River Montane Vole (*Microtus montanus rivularis*)

Status: Federal: Category 2
State: Sensitive (S1S2)

Range: Southwestern Utah and northwestern Arizona

Habitat: This species is generally found in riparian habitats, from low elevations with ponderosa pine to high forests of spruce and aspen (Jensen 1991). Montane voles captured in Arizona and Nevada were found in damp to wet places, living in thick grass with conspicuous runways (Hoffmeister 1986).

Locations: Unknown.

HCP Impacts: Unknown.

PMR: Surveys are needed to determine status in Washington County.

8.2.2.2 Birds

Northern Goshawk (*Accipiter gentilis*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Rocky Mountains south to Mexico, west to northern California; Alaska and Canada

Habitat: Goshawk nests are usually found within dense stands in mature forests. Marginal areas between forested and open areas are thought to provide the best forage for these birds. The goshawk is seldom found in logged areas.

Locations: Over 50 individuals in North Kaibab Ranger District, Kaibab National Forest; over 10 individuals located in Cedar City and Pine Valley Ranger Districts, Dixie National Forest (Crocker-Bedford and Chaney 1986; pers. comm., R. Rodriguez [Dixie National Forest], 1992; pers. comm., Reynolds [NAU], 1992).

HCP Impacts: None expected.

PMR: Habitat for this species in Washington County would likely exist on the Dixie National Forest and Zion National Park, and other forested areas. The Dixie National Forest has a goshawk survey program, and has implemented the Forest Service goshawk guidelines. Goshawks may use lower valleys during winter and migration.

White-faced Ibis (*Plegadis chihi*)

Status:	Federal: Category 2 State: None
Range:	Western United States to Argentina
Habitat:	The white-faced ibis resides in large marshes, with nesting colonies hidden in inaccessible reed-bed or willow-covered areas (Peterson 1990). Prefers mostly freshwater habitats, including marshes, swamps, ponds and rivers. It feeds upon aquatic invertebrates (esp. crayfish), insects, earthworms, fish, small vertebrates. Migratory; winters in South America.
Locations:	White-faced ibis have been observed in the Washington Fields area during spring and summer.
HCP Impacts:	None expected.
PMR:	Identify potential habitats within Washington County and conduct surveys during the appropriate time of year.

Mountain Plover (*Charadrius montanus*)

Status:	Federal: Category 1 State: Sensitive (S2)
Range:	Rocky Mountains area
Habitat:	The mountain plover inhabits drier grasslands, prairies, and plateaus (Peterson 1990). Plovers may selectively inhabit prairie dog towns in some regions. Diet can include grasshoppers, crickets, beetles and flies Winters south to Mexico.
Locations:	Unknown.
HCP Impacts:	None expected.
PMR:	May want to identify potential habitats within Washington County and conduct surveys during the appropriate time of year.

Ferruginous Hawk (*Buteo regalis*)

Status:	Federal: Category 2 State: Threatened
Range:	Western United States
Habitat:	Arid, semi-arid, and grassland regions of western North America. Level and rolling terrain and foothills. Avoids high elevations, forest interiors, narrow canyons, and cliff areas (Palmer 1988). Feeds almost exclusively on small mammals, especially ground squirrels and jackrabbits. Winters in south to central Mexico (Ehrlich et al. 1988).
Locations:	Ferruginous hawks have been documented throughout Washington County.
HCP Impacts:	May benefit from reserve establishment.
PMR:	Conduct surveys during the appropriate time of year to determine status and distribution in Washington County.

Black Tern (*Chlidonias niger*)

Status:	Federal: Category 2 State: Sensitive (S1)

Range: Temperate North America

Habitat: Inhabits freshwater marshes, sloughs, and wet meadows. Largely insectivorous, but eats crayfish and fish plucked from the water's surface. Winters from Panama south to Peru (Ehrlich et al. 1988).

Locations: Unknown.

HCP Impacts: None expected.

PMR: Identify potential habitats within Washington County and conduct surveys during the appropriate time of year.

Western Least Bittern (*Ixobrychus exilis hesperis*)

Status: Federal: Category 2
State: None

Range: Occasional in Utah, Nevada, Arizona

Habitat: Feeds and nests in freshwater marshes and reedy ponds, feeding on small fish, aquatic invertebrates, insects, amphibians and small mammals (Peterson 1990). Winters south to Costa Rica (Ehrlich et al. 1988).

Locations: Unknown.

HCP Impacts: None

PMR: Identify potential habitats within Washington County and conduct surveys during the appropriate time of year.

Yellow-billed Cuckoo (*Coccyzus americanus*)

Status: Federal: None
State: Threatened

Range: Scattered through central and southern United States, and winters in South America.

Habitat: Nests in localized riparian valleys in cottonwood-willow thickets.

Locations: There is a single breeding record from Beaver Dam Wash; however, other suitable habitat probably occurs near streams, rivers, and springs in Washington County.

HCP Impacts: Projected impacts are similar to southwestern willow flycatchers.

PMR: No concerted survey efforts have been conducted for this species. An inventory of species and habitat distributions for this species is needed. Preservation and enhancement of riparian areas is strongly suggested. Grazing can eliminate understory vegetation and inhibit cottonwood regeneration. Purchasing of grazing permits and fencing in riparian zones could reduce grazing pressure. In urban areas and areas impacted by heavy human usage, large blocks of riparian can be protected by signing or fencing and encouraging recreational activities in areas away from riparian zones. Major recreational developments such as golf courses should be designed to maintain or enhance existing riparian and wetland values. Water development projects inundate riparian areas above dams and would require mitigation. Natural water regimes should be mimicked to prevent depletion of water from riparian areas downstream of control structures and provide periodic flooding which rejuvenates riparian

understories. Road developments should be avoided in riparian areas. Riparian areas should be reestablished by planting and protecting willows and other native shrubs and ground cover. Water regimes should be manipulated to enhance re-establishment of riparian plantings.

Common Yellowthroat (*Geothlypis trichas*)

Status:	Federal: None State: Sensitive (S1)
Range:	From Canada to southern Mexico and winters in southern United States to West Indies.
Habitat:	The species depends heavily on marsh vegetation and riparian understories.
Locations:	Nests in riparian and wetland habitats in Washington County and Statewide. Suitable habitat is likely to exist along the Virgin River and its tributaries as well as at perennial springs in Washington County.
HCP Impacts:	Impacts are likely similar to those of the southwestern willow flycatcher.
PMR:	Survey efforts have been limited to the Santa Clara River near Gunlock Reservoir. An inventory of species and habitat distributions for this species is needed. Preservation and enhancement of riparian and wetland areas is suggested (see above discussion for yellow-billed cuckoo).

Yellow-breasted Chat (*Icteria virens*)

Status:	Federal: None State: Sensitive (S1)
Range:	From Canada to southern Mexico and winters in southern United States to Panama.
Habitat:	Nests in dense, mature riparian thickets of lower valleys and canyons.
Locations:	Breeding records from Washington County include Beaver Dam Wash, Santa Clara and Virgin Rivers.
HCP Impacts:	Unknown
PMR:	Same as yellow-billed cuckoo and common yellowthroat.

Bell's Vireo (*Vireo bellii*)

Status:	Federal: None State: Sensitive (S1S2)
Range:	Central to southwest United States and northern Mexico, and winters in Mexico to Nicaragua.
Habitat:	Riparian areas with willows and along streamsides.
Locations:	Nests in streamside willows of the Virgin River and Beaver Dam Wash in southwestern Utah. Breeding records from Washington County are the only known in the State.
HCP Impacts:	Unknown
PMR:	Same as yellow-billed cuckoo.

8.2.2.3 Fish

Flannelmouth Sucker (*Catostomous latipinnis*)

Status: Federal: Category 2
State: None

Range: Virgin River, Colorado River, and Gila River drainages

Habitat: The flannelmouth sucker is found in a wide variety of habitats, from riffles to backwater areas, in larger rivers and streams. Preferred temperature of these fish in the Virgin River is 80 degrees Fahrenheit, though they tolerate a range of 50 to 85 degrees (Deacon et al. 1987).

Locations: Virgin River and tributaries.

HCP Impacts: Similar to woundfin and Virgin River chub

PMR: Same as other native fish species.

8.2.2.4 Amphibians

Arizona Toad (*Bufo microscaphus microscaphus*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Arizona, southern Utah

Habitat: This species is found in or near wetlands in several different types of areas, including shrub steppes, pinyon-juniper woodlands, and pine-oak forests. This toad inhabits shallow permanent or intermittently flowing water over sand or rocky substrates. The Arizona toad is probably the most common toad in the riparian zone within the Mohave Desert ecosystem in Utah (pers. comm., J. Legler [Univ. of Utah], 1993). Anthropogenic alterations to habitat formerly occupied solely by *B. microscaphus* has allowed Woodhouse's toad (*B. woodhousii*) to use such habitat. Hybridization with *B. woodhousii* is a threat to the long-term viability of this species (Sullivan 1991) in Washington County. Where lotic habitats adjoin lentic (i.e., reservoir) habitats, hybridization of the two species can occur (pers. comm. B. Sullivan [ASU],1991,1992).

Locations: Records of this species have come from St. George, Bellevue, and Zion National Park. Museum specimens exist from Hwy. 15/17 at La Verkin (ASU); Beaver Dam Slope Terry's Ranch (MPM); 2 miles south of St. George (Tulane Univ.); Springdale (Cornell Univ.); 3 miles south of Leeds (MSU); Lytle Ranch 30 miles west of St. George (Univ. of Utah; 100 meters west of Santa Clara River bridge on Santa Clara Littlefield Road, 4.5 kilometers north of the Virgin River junction of Route 91 and Gunlock Road (Univ. Kansas); 3 miles northeast of Virgin (AMNH).

HCP Impacts: Concern should be given to construction of reservoirs which eliminate lotic conditions, required breeding habitat for *B. microscaphus*. Elimination of herbaceous and shrub growth along the Virgin River and its tributaries is of equal concern. Alterations to water quality should be monitored as development pressures increase.

PMR: Surveys documenting the population status, distribution, and status of hybridization with Woodhouse's toad should be conducted on an annual basis as dictated by governmental listings, human development pressures, and knowledge of the status of the species changes.

Lowland Leopard Frog (*Rana yavapaiensis*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Arizona south to Mexico, southern California, southwest Utah

Habitat: This leopard frog prefers foothill streams, overflows and stock tanks in areas of desert grass, oak or oak-pine habitat types. Generally found at an altitude of about 3,500 feet, although found at elevations below 2,000 feet (pers. comm., J. Wynes, 1992). Most populations occupy ponds and stream and river pools below 3,280.8 feet in elevation.

Locations: This species was described in 1984 (Platz and Frost 1984), and the only published record from Utah is from near St. George. This species was observed along the Virgin River downstream from St. George in 1992, and several ranid frogs were observed on the Virgin River near the Utah/Arizona border (pers. comm., R. Fridell [UDWR],1992). Presently, Randy Jennings (Univ. Nevada, Las Vegas) is determining the status of leopard frogs (*Rana pipiens* complex) along the Virgin River.

HCP Impacts: Nothing is known of the distribution and status of this amphibian in Utah.

PMR: Surveys supplementing those conducted by Randy Jennings are necessary prior to suggesting any detailed management schemes. Protection of water quality, springs, riverine pools, and riparian shrub and herbaceous communities along the Virgin River corridor would likely benefit potential habitat for this species.

Relict Leopard Frog (*Rana onca*)

Status: Federal: Category 3a
State: Extinct

Range: Dr. Jennings at UNLV may have rediscovered the relict leopard frog in Nevada; however, range and status in Utah is unknown (pers. comm., R. Jennings [Barrick Museum of Natural History, Univ. of Las Vegas], 1993).

Habitat: In Utah, this ranid frog is restricted in habitat to creeks, springs, and seeps in the Virgin River Valley (pers. comm., R. Jennings [Barrick Museum of Natural History, Univ. of Las Vegas], 1993).

Locations: This species (described by Cope 1875), whose type-locality was judged by to be along the Virgin River in Washington County, Utah, was believed extinct by the USFWS (56 *FR* 58814). The relict frog occurred in "Berry Springs" and "6 miles east of St. George." Specimens from these localities are represented in Brigham Young University and University of Michigan museum collections, respectively. Berry Springs was drained in 1973, and the original spring is now a swimming area. Field surveys in 1983 and 1984 revealed no relict frog populations in Utah. However, surveys in

1984 were conducted after severe flooding in the St. George area. In 1992, *onca-yavapaiensis*-like specimens were discovered in springs within Lake Mead National Recreation Area in Nevada. Recent evidence suggests that this species may be synonymous with *R. yavapaiensis* (R. Jennings, Barrick Museum of Natural History, Univ. of Las Vegas, pers. comm. 1993). Conclusive analyses of speciation within this ranid frog complex have not been completed. Also see lowland leopard frog account.

HCP Impacts: None expected, as the species is not known to occur within Washington County.

PMR: Same as for the lowland leopard frog.

Boreal Toad (*Bufo boreas boreas*)

Status: Federal: Proposed to be listed
State: Sensitive (S1)

Range: Southern Alaska to northern Baja California; Rocky Mountains to the Pacific Coast.

Habitat: This toad frequents a great variety of habitats: desert streams and springs, as well as grassland, woodland, and mountain meadows with nearby ponds, lakes, reservoirs, rivers, and streams. In low-lying areas, the toad is active at night, and at higher elevations it is diurnal (Stebbins 1985).

Locations: This toad occurred in the canyons and mountains of Utah (Tanner 1931), and one record exists from Washington County (Pine Valley Reservoir) (BYU Museum). Although there are no recent records from the County, individuals may occur in areas of higher elevation (above 1800 m). In 1993, several adults were observed at one site south of Tropic Reservoir in northwestern Kane County (pers. comm., R. Fridell [UDWR], 1992). There are no other occupied sites known in southern Utah in recent years. Populations of this species have been disappearing in Colorado (Carey 1993).

HCP Impacts: None known at this time. Concern should occur if development pressure occurs in habitats greater than 6,000 feet in elevation

PMR: Surveys are necessary to document the distribution and status of this toad in Washington County.

8.2.2.5 Reptiles

Western Chuckwalla (*Sauromalus obesus obesus*)

Status: Federal: Category 2
State: Threatened

Range: Sonoran and Mojave Deserts

Habitat: Rocks and rocky crevices are used for night and day shelter, sunning stations, and hibernation; scattered rocks are used for temporary shelter during diurnal foraging away from home crevices (Lowe 1964). *Sauromalus obesus* is a herbivorous, large lizard, slow to mature, single-

brooded, with repeated reproductions. Most of the members of populations are adults, with few or often no juveniles added each year (Berry 1974).

Locations: The western chuckwalla is known to occur in rocky outcrops and boulder fields of lower hills in Washington County (Woodbury 1931). Recent records exist from Quail Lake, Red Cliffs, Ft. Pierce Wash, Sandstone Mountain, Padre Canyon, Paradise Canyon, the Hurricane Cliffs east of Hurricane (pers. comm., R. Fridell [UDWR], 1992), the Gunlock area, Cottonwood Wash north of Washington, east side of Interstate 15 in the Leeds area, Guttner property north of Red Cliff (pers. comm. S. Belfit, [BLM]), and Bloomington Hills (pers. comm., D. Kay [UDWR], 1992). Historic records include Rockville, Leeds, St. George, and Santa Clara. Museum collections include specimens from St. George Black Ridge, St. George, south of St. George near Virgin River, Red Hill north of St. George, Chuckwalla Canyon north of Shivwits Indian Tribal Lands (Dixie College), Santa Clara Canyon (National Museum of Natural History), Zion National Park, 21 miles northeast of St. George, 4.6 miles south southwest of St. Gorge (Univ. Calif., Berkeley), 1 mile west of St. George, Snow Canyon State Park, 1 mile north of St. George, and the Beaver Dam Desert tortoise Area (Univ. Utah). Little is known regarding the status of this large lizard in the County.

HCP Impacts: There are numerous locations where chuckwallas probably occur along with Gila monsters and desert tortoises. Protection of boulder fields along the base of cliffs and slopes should be a priority.

PMR: Implementation of annual surveys would help determine the population status and distribution of this species in the County. Navajo Sandstone and cinder fields are occupied by desert tortoises, Gila monsters, and chuckwallas. Species associations should be mapped out, and those areas valuable to many species should receive priority for preservation.

Gila Monster (*Heloderma suspectum*)

Status: Federal: Category 2
State: Endangered

Range: South of San Bernardino, California, to southwestern Utah to southwestern New Mexico into Mexico.

Habitat: This poisonous lizard occurs in basaltic lava slopes or flows, and loose Navajo Sandstone boulder fields (Beck 1990) that have an abundance of vegetation.

Locations: Bureau of Land Management Red Cliffs Recreation Area, Lava Hills Golf Course, Snow Canyon, Paradise Canyon, Padre Canyon, Beaver Dam Slope, Cedar Pockets Wash, Santa Clara Bench, Shivwitz, Bloomington, Black Hill west of St. George, Dixie Red Hill, Millcreek, Buckskin Hollow, Black Gulch, Cottonwood Creek, Quail Creek, Ft. Pearce Wash in Warner Valley (Beck 1985), and Webb and Schmutz Hills (pers. comm., R. Fridell [UDWR], 1992). Gila monsters are inactive for long periods,

and populations are spottily distributed even in areas of excellent habitat (Beck 1985).

HCP Impacts: Elimination of several population pockets of this unique lizard is expected to occur as a result of the HCP implementation. However, the species is expected to benefit from reserve establishment in areas such as Paradise Canyon.

PMR: Beck (1985) predicted the extirpation of Gila monsters from Utah by the year 2000 if habitat preservation measures are not implemented. All of the populations as identified by Beck (1985) should be mapped out, and those areas of dense populations or suitable habitat should be protected. Again, in concert with changing development needs, species listings, and species population needs, these management recommendations should be updated on an annual basis.

Desert Night Lizard (*Xantusia vigilis*)

Status: Federal: None
State: Sensitive (S2)

Range: The Mojave Desert and inner Coast Ranges of California, southern Nevada and Utah, and central Arizona.

Habitat: This diurnal and crepuscular lizard of arid land lives chiefly beneath fallen branches of Joshua trees, and under dead clumps of various other species of yucca, nolina, agava, and cardons (Stebbin 1985).

Locations: In Washington County, this species is limited to Mojave Desert habitat where yucca and joshua tree plants occur (Bezy 1984). This lizard has been known to occur at the following locations: the Beaver Dam Slope, St. George, Terry's Ranch 10 miles west of Castle Cliff, Washington 2.9 miles west of Castle Cliff (Univ. Utah), 5 miles west of Castle Cliff (AMNH), 6 miles east of Castle Cliff Beaver Dam Slope (MPM), on US Hwy. 91 near AZ line, 11.9 road miles southwest of Shivwits (vic. Castle Cliff)(LACM), 9.5 miles from Santa Clara Littlefield road turnoff on Snow's Ranch Road (MVZ).

HCP Impacts: The reserve design and location should incorporate some key areas to secure populations and quality habitat for this lizard. These needs may need to be updated annually as new knowledge of the species habitat is gained.

PMR: Surveys documenting the distribution and status of this secretive lizard should be coordinated on an annual basis. The distribution and density of those plants comprising its essential cover (i.e., Joshua trees, yucca, agave) should be mapped.

Glossy Snake (*Arizona elegans*)

Status: Federal: None
State: Sensitive (S2)

Range: From southern California, Arizona, New Mexico, and from Kansas south into Mexico.

Habitat: This snake occurs in a variety of habitats; chaparral-covered slopes, grassland, light brushy to barren desert, sagebrush flats, and woodlands (Stebbins 1985). In general it prefers open areas.

Locations: This species is restricted to extreme southwestern Washington County in the Mojave Desert. Museum records exist from Watercress Springs, St. George near Watercress Springs, near Bloomington (LACM), 3–4 miles SE St. George, Beaver Dam Slope, St. George, Terry's Ranch 10 miles W. Castle Cliff, 2.9 miles West Castle Cliff (Univ. Utah), and on road between Santa Clara and St. George (Dixie College). Little is known regarding the habitat requirements and distribution of this species in the County.

HCP Impacts: Elimination of open habitats will reduce populations of this snake. As more life history, distribution, and habitat information is acquired regarding this species, more its habitat needs should be integrated into the HCP.

PMR: Annual surveys documenting the distribution and status of this poorly known reptile would help identify important habitat areas.

Utah Mountain Kingsnake (*Lampropeltis pyromelana infralabialis*)

Status: Federal: None
State: Sensitive (S1)

Range: In central Utah with isolated population in eastern Nevada and northern Arizona.

Habitat: This snake is a mountain dweller, ranging from pinyon-juniper woodland and chaparral to the pine-fir belt. It frequents both brushland and coniferous forest, often near water (Stebbins 1985).

Locations: This snake occurs in mountains and forests from 5,400 to 7,000 feet in elevation (Woodbury 1931) in northern Washington County. Museum specimens exist from New Harmony, Oak Grove, Pine Valley, and Santa Clara (BYU). Field observations exist from right fork Beaver Dam Wash, Browse Canyon, near Central, Enterprise Reservoir, Kolob Canyon (Zion National Park), Leeds Creek, Oak Grove Campground, Pine Grove campground, Wildcat Mountain, and Ash Creek Reservoir (pers. comm., B. Bartholomew, 1992). Field observations indicate that this montane snake frequently uses riparian habitats with an abundance of boulders (pers. comm., B. Bartholomew, 1992). There are two records from pinyon-juniper areas distant from riparian habitats.

HCP Impacts: If development commences above 5400 feet in elevation, then consideration should be given to protecting brushland and forested areas in areas in and near riparian habitats having an abundance of boulders. As more life

history and distribution information is acquired regarding this species, integration of its habitat needs

PMR: Surveys documenting denning areas and population status of this secretive snake would be beneficial.

Utah Milk Snake (*Lampropeltis triangulum taylori*)

Status: Federal: None
State: Sensitive (S1)

Range: Central and southern Utah and into western Colorado.

Habitat: Field observations indicate that it uses a variety of habitats from riparian, agricultural, meadows, sagebrush, pinyon-juniper, and coniferous forests in Utah (pers. comm., B. Bartholomew, 1992). Little is known regarding the status and habitat requirements of this species.

Locations: This species is only known from Pine Valley (BYU) in Washington County.

HCP Impacts: As more knowledge is acquired regarding its distribution, status, and habitat needs, these requirements should be integrated into the HCP.

PMR: Surveys documenting the den sites and population status of this snake would be beneficial.

Utah Banded Gecko (*Coleonyx variegatus utahensis*)

Status: Federal: None
State: Sensitive (S2)

Range: Southern Nevada, northwestern corner of Arizona and southwestern Utah.

Habitat: This lizard is limited to the Mojave Desert habitat and is most often found in slabs of red sandstone rock. South-facing slopes usually hold the highest densities.

Locations: Records exist from St. George, Gunlock, Zion National Park (Woodbury 1931), Beaver Dam Mountains, near Watercross Springs, Indian Farm, near St. George (UMMZ), Beaver Dam Wash at Terry's Ranch, Ivin's Sands above Santa Clara, Beaver Dam Slope, St. George Black Ridge, Chuckwalla Canyon near Gunlock, Warner Valley, Veyo, 5 miles north of St. George, Ft. Pierce, 0.5 mile north of St. George (Dixie College), Snow Canyon State Park, 3 miles SE of St. George, Bloomington, near West Spring St. George, Terry's Ranch 10 miles West Castle Cliff (Univ. Utah), Shivwitz Indian Farm, Watercress Springs, Diamond Valley (LACM), and 6 miles west of Castle Cliff Beaver Dam Slope (MPM).

HCP Impacts: Integration of key habitat needs for this poorly known lizard should be planned. Those areas containing south-facing Navajo Sandstone rock within the species range should be protected within the HCP. As new populations of this species are discovered, they should be prioritized for management needs.

PMR: Surveys documenting the distribution and status of this secretive lizard on an annual basis would be beneficial.

Desert Iguana (*Dipsosaurus dorsalis*)

Status: Federal: None
State: Sensitive (S2)

Range: From southern Nevada to tip of Baja California, and from the desert side of mountains in southern California to central Arizona.

Habitat: Typical habitat for this lizard consists of creosote bush desert with hummocks of loose sand and patches of firm ground with scattered rocks (Stebbins 1985).

Locations: This species is limited to a few square miles of the sandy Mojave Desert where scattered shrubs occur. In Washington County, this lizard is only known from immediately north of the Arizona border. Specimens exist in museums from Beaver Dam Wash (LACM). This lizard is probably not common in the County.

HCP Impacts: None expected

PMR: Surveys documenting the distribution and status of this large lizard in Washington County would be beneficial.

Zebra-tailed Lizard (*Callisaurus draconoides*)

Status: Federal: None
State: Sensitive (S2)

Range: Central Nevada down into southern California, southwestern corner of Utah and central and southern Arizona.

Habitat: This lizard is most common in desert washes, although it does occur on open plains.

Locations: It occurs from the Beaver Dam Slope north to Zion National Park. This lizard is quite common in washes on the Beaver Dam Slope. Published records include Leeds, Virgin,. and Santa Clara (Woodbury 1931). Museum records exist from Terry's Ranch on Beaver Dam Wash, Warner Valley, 0.5 mile east of St. George, Red Hill North of St. George, St. George 700 East 100 North, St. George North 500 West, and Bulldog Wash at desert tortoise den area (Dixie College). This lizard is common in suitable habitats in Washington County.

HCP Impacts: Protection of sandy washes will be a key component to retain viable populations of this Mojave-associate for the future.

PMR: Surveys would help document the distribution and status of this lizard in the County. These surveys should be updated as development pressures change and more knowledge of this species status and distribution is acquired.

Lyre Snake (*Trimorphodon biscutatus lambda*)

Status: Federal: None
State: Sensitive (S2)

Range: From southern California, southern Nevada, southwestern Utah, and central and southern Arizona.

Habitat: Rocks and rock crevices in the Mojave Desert system comprise the habitat for this snake (Klauber 1940).

Locations: This snake has been collected from Zion Canyon (Woodbury 1931), 1 mile East of Springdale (Univ. Mich.), Red Hill north of St. George, Red Hill Sugarloaf, 3 miles southeast of St. George (Dixie College), Zion National Park 1 mile north of Springdale, and St. George. Little is known regarding the distribution and status of this species in the County.

HCP Impacts: Rocky areas, such as those proposed to be included in the reserve area, would be better protected under implementation of this HCP. Some areas identified for incidental take may contain potential habitat for this species.

PMR: Annual surveys would help ascertain the status and distribution of this snake.

Western Blind Snake (*Leptotyphlops humilis*)

Status: Federal: None
State: Sensitive (S2)

Range: Southern California, southern Nevada, southwestern Utah, southern New Mexico, and western and southern Arizona.

Habitat: This burrowing species occurs in rocky areas with sandy soils where the sub-soil is moist (Stebbins 1985).

Locations: Museum collections exist from St. George (LACM), Washington Red Hill, St. George (Univ. Utah), and Snow Canyon area of Sand Dunes (Dixie College). Very little is known regarding the distribution and status of this species in the County.

HCP Impacts: The proposed reserve likely contains potential habitat for this species. Some of the areas designated for incidental take may also contain potential habitat for this species.

PMR: As new knowledge regarding the distribution and status of this burrowing snake become available, this information should be integrated into the HCP.

Mojave Patchnose Snake (*Salvadora hexalepis mojavensis*)

Status: Federal: None
State: Sensitive (S2)

Range: Southern California, southern Nevada, southern Utah, and northwestern Arizona

Habitat: This snake is an active diurnal resident of grasslands, chaparral, sagebrush plains, and desert scrub. Also found in both sandy and rocky areas on the lower slopes of mountains and on low, dry creosote bush plains in the most extreme parts of the desert (Stebbins 1985).

Locations: Little is known of the distribution or status of this snake in the County. Museum records of this snake exist from Beaver Dam Slope 22 miles SW St. George, Oak Grove Recreation area north of Leeds 3 miles south of campground, Beaver Dam Mountains on US Hwy. 91,and about 10 miles

N. St. George on Cottonwood Road. This species has been reported from the dry, sandy foothills west of St. George.

HCP Impacts: Unknown at this time; however, potential habitat may exist in the reserve. Integration of management considerations for this species should occur as new ecological information becomes available.

PMR: Surveys to determine the population status and distribution of this species would be beneficial.

Speckled Rattlesnake (*Crotalus mitchellii*)

Status: Federal: None
State: Sensitive (S2)

Range: Southern California, southeastern corner of Nevada, southwestern corner of Utah, and western Arizona

Habitat: This species occupies the driest, hottest rocky areas such as canyons and foothills (Ernst 1992).

Locations: In Utah, this rattlesnake is limited to the Beaver Dam Slope. Little ecological data exist for this species in Utah.

HCP Impacts: The HCP does not identify any areas for incidental take on the Beaver Dam Slope, nor does it change the current management practices. This is because the Beaver Dam Slope is in a different Recovery Unit. Therefore the HCP will have no impact on this species.

PMR: Surveys documenting the distribution, status, and den sites would be beneficial to an understanding of this species.

Mojave Rattlesnake (*Crotalus scutulatus*)

Status: Federal: None
State: Sensitive (S2)

Range: South Nevada to southern edge of Mexican plateau, from western edge of Mohave Desert to extreme western Texas

Habitat: A desert brushy grassland species. This snake spends a large portion of time in animal burrows or under rocks (Ernst 1992).

Locations: Restricted in Utah to the Beaver Dam Slope. Little is known of the status of this species in Utah (Woodbury and Hardy 1948).

HCP Impacts: Same as for the speckled rattlesnake.

PMR: Same as for the speckled rattlesnake.

Sidewinder (*Crotalus cerastes*)

Status: Federal: None
State: Sensitive (S2)

Range: Southeastern California, southern Nevada, southwestern corner of Utah, and extreme western Arizona

Habitat: Occurs in sandy areas in low-lying areas and infrequently occurs in rocky or gravelly sites in desert habitat (Ernst 1992).

Locations: In Utah, restricted to the Mojave Desert association from the St. George area south to the Arizona border. This snake has been recorded from St. George and Hurricane (Woodbury 1931), and Paradise Canyon.

HCP Impacts: The proposed reserve likely contains habitat for this species, and some incidental take areas may contain potential habitat.

PMR: Surveys need to be implemented to determine population status, distribution, and den sites of this Mojave Desert dweller. As new information becomes available regarding this snakes distribution, density, status, and habitat requirements, it should be integrated into the HCP.

8.2.2.6 Plants

Virgin River Thistle (*Cirsium virginensis*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Washington County, Utah; Mojave County, Arizona; and Clark County, Nevada.

Habitat: The Virgin River thistle occurs in saline seeps and stream terraces in shadscale, creosote bush, mesquite, and hanging garden communities. Elevation ranges from approximately 2,800 to 3,100 feet (Welsh 1982; Utah TES plant guide 1991).

Locations: Known to occur near St. George, Utah, and Mojave County, Arizona. Legal locations given in Washington County are Township 42 South, Range 15 West and Township 43 South, Range 17 West (Welsh 1982; Welsh and Chatterley 1985).

HCP Impacts: None expected.

PMR: Additional surveys need to be completed for this species.

Pink Egg Milk-vetch (*Astragalus oophorus* var. *lonchocalyx*)

Status: Federal: Category 2
State: Sensitive (S1S2)

Range: Western Iron and Beaver Counties, Utah

Habitat: This milk-vetch is found in pinyon-juniper, sagebrush, and mixed desert shrub communities at 5,800 to 7,545 feet elevation (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: Additional surveys need to be conducted for this species.

Zion Tansy (*Sphaeromeria ruthiae*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Zion National Park, Utah

Habitat: This plant inhabits the crevices and canyon walls of the Navajo Sandstone formation, and its preferred elevation is approximately 4,800 feet (Welsh

and Chatterley 1985; Welsh and Thorne 1979; Utah TES plant guide 1991).

Locations: The Zion tansy is known only from Zion National Park where it is located on vertical sandstone cliffs. It blooms very late in the season, therefore escaping the attention of most people visiting the park. Legal locations given in Washington County are Township 41 South, Range 10 West and Township 40 South, Range 10 West (Welsh and Chatterley 1985).

HCP Impacts: Due to it location with Zion National Park and its biological cycle, no impacts are expected.

PMR: None

Pinyon Penstemon (*Penstemon pinorum*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Iron County, Utah

Habitat: Pinyon-juniper community between 5,600 and 5,800 feet (Utah TES plant guide 1991).

Locations: Endemic to the Pine Valley Mountains, Iron County, Utah (Utah TES plant guide 1991)

HCP Impacts: None expected.

PMR: Additional surveys need to be completed, as very little survey work has been conducted on this species.

Canaan Mountain Beardtongue (*Penstemon ammophilus*)

Status: Federal: Category 2
State: Sensitive (S2?)

Range: Washington, Kane, Garfield Counties, Utah

Habitat: Found in blowsand derived from Navajo Sandstone, in ponderosa pine, and in mixed shrub communities at 5,400 to 6,600 feet (Utah TES plant guide 1991).

Locations: Species individuals are located in the extreme southeastern corner of Washington County. Known only from Garfield, Kane, and Washington Counties, Utah (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: Additional surveys need to be completed for this species. Mr. Stan Welsh is currently conducting surveys on this species near the White Cliffs area. He sees no threats from development to this species.

Nevada Willowherb (*Epilobium nevadense*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Washington, Millard Counties, Utah; Clark County, Nevada

Habitat: This plant inhabits rocky limestone outcrops and talus slopes in pine duff of the ponderosa-aspen community. Elevation ranges from 7,500 to 9,200 feet (Welsh and Thorne 1979; Welsh and Chatterley 1985). Also described

as being found in creosote bush and pinyon-juniper communities between 2,985 and 8,800 feet elevation (Utah TES plant guide 1991).

Locations: Clark County, Nevada, and Washington and Millard Counties, Utah. Legal locations given for Washington County are Township 42 South, Range 18 West and Township 38 South, Range 19 West (Welsh and Chatterley 1985).

HCP Impacts: None expected.

PMR: Additional surveys need to be completed for this species. Dr. Cromquist has been working with this species. Dr. Welsh does not see any threats to this species as development is not likely to occur where this species exists.

Canaan Daisy (*Erigeron canaani*)

Status: Federal: Category 2
State: Sensitive (S1)

Range: Washington County, Utah

Habitat: Ponderosa pine community at 5,200 to 6,800 feet (Utah TES plant guide 1991).

Locations: Endemic to eastern Washington County, Utah (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: Primarily located within the boundaries of Zion National Park and receives protection within those boundaries.

Pine Valley Goldenbush (*Haplopappus crispus*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Washington and Millard Counties, Utah

Habitat: Ponderosa pine, fir, manzanita, and aspen communities between 5,970 to 9,200 feet (Utah TES plant guide 1991).

Locations: Endemic in Washington and Millard Counties, Utah (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: Additional surveys need to be completed, as very little survey work has been conducted on this species. Mr. Franklin feels surveys for this species should be of high priority. However, Dr. Welsh feels that this species occurs all over Pine Mountain and development would have to cover the entire mountain to endanger this species.

Cedar Breaks Goldenbush (*Haplopappus zionis*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Garfield, Iron, Kane Counties, Utah

Habitat: Spruce-fir and ponderosa pine communities mostly on the Cedar Breaks limestone formation (Wasatch) between 8,000 and 10,000 feet (Utah TES plant guide 1991).

Locations: Endemic to Garfield, Iron, and Kane Counties, Utah (Utah TES plant guide 1991).

HCP Impacts: None expected.

PMR: Additional surveys need to be completed, as very little survey work has been conducted on this species. Mr. Franklin also feels surveys for this species should be of high priority.

Gumbo Milk-vetch (*Astragalus ampullarius*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Southern Utah, Northern Arizona

Habitat: This plant grows on the Chinle and Tropic Shale formations in a mixed desert shrub and scattered juniper community type. Elevational range extends from 3,200 to 5,400 feet (Welsh and Chatterley 1985, Welsh and Thorne 1979, Utah TES plant guide 1991).

Locations: Gumbo milk-vetch is known only from southern Utah and adjacent Arizona, where it occurs near the Cockscomb to the west of Kanab in Kane County and southeast of Motoqua in Washington County. Legal locations given for Washington County are Township 43 South, Range 15 West; Township 42 South, Range 11 West; and Township 41 South, Range 17 West (Welsh and Chatterley 1985).

HCP Impacts: Areas in which the gumbo milk-vetch are found are generally on BLM and State lands. These lands are not likely to be developed in the foreseeable future, but current grazing and other multiple use management activities will continue, with an undetermined effect on populations of gumbo milk-vetch.

PMR: None, as surveys have revealed that this species is more abundant than originally thought, and the species could be proposed for delisting to Federal Category 3-C in the near future (pers. comm., B. Franklin [UNHP], 1993).

Zion Daisy (*Erigeron zionis*)

Status: Federal: Category 2
State: Sensitive (S2)

Range: Washington, Kane counties, Utah

Habitat: This species inhabits rock crevices of the Navajo Sandstone formation in the ponderosa pine community. Ranges in elevation from 4,400 to 7,500 feet (Welsh and Chatterley 1985). Also described as inhabiting seeps and hanging gardens in ponderosa pine and riparian communities in Navajo and Wingate Sandstones at 4,420 to 5,250 feet (Utah TES plant guide 1991).

Locations: Washington and Kane Counties, Utah. Legal locations given for Washington County are Township 40 South, Range 10 West; Township 42 South, Range 9 West; and Township 41South, Range 10 West.

HCP Impacts: None expected.

PMR: None.

8.2.2.7 Insects

Utah Chaetarthrian Water Scavenger Beetle (*Chaetarthria utahensis*)

Status:	Federal: Category 2
	State: Sensitive (S2?)
Range:	Washington County, Utah
Habitat:	Unknown
Location:	This beetle is limited to Santa Clara Creek in Washington County (Miller 1974).
HCP Impacts:	None expected.
PMR:	Unknown.

Spotted Warner Valley Dunes June Beetle (*Polyphylla avittata*)

Status:	Federal: Category 2
	State: Sensitive (S2?)
Range:	Warner Valley Dunes, Washington County.
Habitat:	Vegetation on the dunes is primarily *Artemesia filiformis*.
Location:	This species was collected at blacklights placed upon the Warner Valley Dunes.
HCP Impacts:	None expected.
PMR:	Unknown.

MacNeill Sooty Wing Skipper (*Hesperopsis gracielae*)

Status:	Federal: Category 2
	State: Sensitive (S1)
Range:	Lower Colorado River as far north as Washington County, Utah.
Habitat:	This butterfly lives in clumps of quailbrush (*Atriplex lentiformis*) along the Lower Colorado River. Larvae eat the quailbrush and adults fly from April to October in several broods.
Locations:	Unknown.
HCP Impacts:	None expected.
PMR:	Unknown.

Table 8.1 presents a summary of information for all candidate species discussed in this chapter.

Table 8.1. Summary of Candidate Species Information

Common Name	Scientific Name	Status		Surveyed	Acquire/Reserve	Need Other Protection
		Fed	State			
Virgin Spinedace	*Lepidomeda mollispinis mollispinis*	C2	Endangered	Y	N	Y
Spotted Bat	*Euderma Maculatum*	C2	S1	Y	Y	Y
Shem Milk-vetch	*Astragalus eremiticus* var. *ampullariodies*	C2	S1	N	Y	Y
Holmgren Milk-vetch	*Astragalus homgreniarium*	C1	S1	N	N	Y
Wet Rock Physa	*Physelia zionis*	C2	S2	N	N	N
Bonneville Cutthroat Trout	*Oncorhynchus clarki utah*	C2	S1	N	N	N
Merriam's Kangaroo Rat	*Dipodomys merriami frenatus*	C2	S2	Y	N	N
Pygmy Rabbit	*Brachylagus idohoensis*	C2	-	Y	Y	N
Virgin River Montane Vole	*Microtus montanus rivularis*	C2	S1S2	Y	Y	N
Northern Goshawk	*Accipiter gentilis*	C2	S1	N	N	N
White-faced Ibis	*Plegadis chihi*	C2	-	Y	Y	N
Mountain Plover	*Charadrius montanus*	C1	S2	Y	N	N
Ferruginous Hawk	*Buteo regalis*	C2	Threatened	Y	N	Y
Black Tern	*Chlidonias niger*	C2	S1	Y	Y	N
Western Least Bittern	*Ixobrychus exilis hesperis*	C2	-	Y	Y	N
Yellow-billed Cuckoo	*Coccyzus americanus*	-	Threatened	Y	Y	Y
Common Yellowthroat	*Geothlypis trichas*	-	S1	Y	Y	Y
Yellow-breasted Chat	*Icteria virens*	-	S1	Y	Y	Y
Bell's Vireo	*Vireo bellii*	-	S1S2	Y	Y	Y
Flannelmouth Sucker	*Catostomous latipinnis*	C2	-	N	N	N
Arizona Southwestern Toad	*Bufo microscaphus microscaphus*	C2	S1	Y	Y	N
Lowland Leopard Frog	*Rana yavapaiensis*	C2	S1	Y	Y	N
Relic Leopard Frog	*Rana onca*	C3a	Extinct	Y	Y	N
Boreal toad	*Bufo boreas boreas*	Proposed	S1	Y	Y	N
Chuckwalla	*Sauromalus obesus obesus*	C2	Threatened	Y	N	Y
Gila Monster	*Heloderma suspectum*	C2	Endangered	N	N	Y
Desert Night Lizard	*Xantusia vigilis*	-	S2	Y	N	N
Glossy Snake	*Arizona elegans*	-	S2	Y	N	N
Utah Mountain Kingsnake	*Lampropeltis pyromelana infralabialis*	-	S1	Y	N	N
Utah Milk Snake	*Lampropeltis triangulum taylori*	-	S1	Y	N	Y
Utah Banded Gecko	*Coleonyx variegatus utahensis*	-	S2	Y	N	Y
Desert Iguana	*Dipsosaurus dorsalis*	-	S2	Y	N	N
Zebra-tailed Lizard	*Callisaurus draconoides*	-	S2	Y	N	N
Lyre Snake	*Trimorphodon biscutatus lambda*	-	S2	Y	N	Y
Western blind Snake	*Leptotyphlops humilis*	-	S2	Y	N	Y
Mojave Patchnose Snake	*Salvadora hexalepis mojavensis*	-	S2	Y	N	N
Speckled Rattlesnake	*Cotalus mitchellii*	-	S2	Y	N	N
Mojave Rattlesnake	*Crotalus scutalatus*	-	S2	Y	N	N
Sidewinder	*Crotalus cerastes*	-	S2	Y	N	Y
Virgin River Thistle	*Cirsium virginensis*	C2	S1	Y	Y	N
Pink Egg Milk-vetch	*Astragalus oophorus* var. *lonchocalyx*	C2	S1S2	Y	N	N
Zion Tansy	*Sphaeromeria ruthiae*	C2	S2	N	Y	N
Pinyon Penstemon	*Penstemon pinorum*	C2	S1	Y	N	N
Canaan Mountain Beardtongue	*Penstemon ommophilus*	C2	S2?	Y	N	N
Nevada Willowherb	*Epilobium nevadense*	C2	S1	Y	N	N
Canaan Daisy	*Erigeron Canaani*	C2	S1	N	N	N
Pine Valley Goldenbush	*Haplopappus crispus*	C2	S2	N	N	N
Cedar Breaks Goldenbush	*Haplopappus zionis*	C2	S2	Y	N	N

Table 8.1. (Continued)

Common Name	Scientific Name	Status		Surveyed	Acquire/Reserve	Need Other Protection
		Fed	State			
Gumbo Milk-vetch	*Astragalus ampullarius*	C2	S2	N	N	N
Zion Daisy	*Erigeron sionis*	C2	S2	N	N	N
Utah Chaetarthrian Water Scavenger Beetle	*Chaetarthria utahensis*	C2	S2?	?	Y	?
Spotted Warner Valley Dunes June Beetle	*Polyphylla avinata*	C2	S2?	?	N	N
MacNeill Sooty Wing Skipper	*Hesperopsis gracielae*	C2	S1	?	Y	N

KEY:

Category 1: Taxa for which the USFWS has sufficient (but not necessarily complete) information on vulnerability and threats to support a proposal to list them as threatened or endangered.

Category 2: Taxa for which the USFWS has insufficient information to support a proposed rule to add the species to the threatened or endangered species list. Further biological research and field study will usually be needed to change the status of taxa in category 2.

Category 3a: Taxa for which the USFWS has persuasive evidence of extinction.

Category 3c: Taxa that are more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat. Should further research or changes in land use indicate decline in any of these taxa, they may be re-evaluated for possible inclusion in category 1 or 2 or listed as threatened or endangered.

Sensitive: Any wildlife species which, although still occurring in numbers adequate for survival, whose population has been greatly depleted, is declining in numbers, distribution, and/or habitat (S1);occurs in limited areas and/or numbers due to a restricted or specialized habitat (S2); or both (S1S2).

Extinct: Any wildlife species that has disappeared in the world.

Endangered: Any wildlife species, subspecies, or population which is threatened with extirpation from Utah or extinction.

Threatened: Any wildlife species, subspecies, or population which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range in Utah or the world.

CHAPTER 9.0
DISCUSSION OF WATER IMPACTS ON ENDANGERED FISH

Washington County owns no water rights and provides no utilities (including water) to its residents. The Washington County Water Conservancy District (WCWCD) was created as a separate and distinct body to develop and protect the County's water supplies. The WCWCD owns substantial water rights and is charged with the responsibility of developing water and preserving water rights for the benefit of Washington County. To this end, the WCWCD is developing the Virgin River Basin Integrated Resource Management and Recovery Program (VRBIRM&RP).

On October 19, 1995 a memorandum was signed between BLM, USFWS, Washington County Water District and the State of Utah to establish the VRBIRM&RP. This program would be consistent with the HCP in duration, although commitments for instream flows and take, once identified, would be in perpetuity. The issuance of the incidental take permit for desert tortoise would not be withheld if the VRBIRM&RP is not finalized by the time a desert tortoise permit is ready for approval.

Washington County itself does not possess regulatory authority with respect to the issuance or management of water rights for instream flows or discharge permits with respect to water quality which may impact threatened or endangered fish or other species in the Virgin River. The desert tortoise, which is the primary focus of this HCP, is a terrestrial species, and its habitat needs lack any nexus to those of aquatic species which require instream flows or pools of water to survive.

Washington County is aware, however, that there are substantial issues surrounding habitat for endangered, threatened, and candidate fish species. Therefore, the County endorses the VRBIRM&RP as proposed by the Washington County Water Conservancy District and anticipates that Washington County will endorse and cooperate, as appropriate, in the final program.

The proposed VRBIRM&RP would protect and provide beneficially compatible uses for a large portion of the real property located along the river system within the 100-year floodplain. This floodplain is the habitat for many of the TE&S animal species located within Washington County. There are six native fish present: the woundfin minnow (endangered), the Virgin spinedace (Category 1), Virgin River chub (endangered), the speckled dace, flannelmouth sucker (Category 2), and the desert sucker. In addition, most of the riparian and wetland areas in Washington County occur within the Virgin River 100-year floodplain.

This program would be the focus of a cooperative effort to set aside the river habitat as an ecologically compatible parkway and provide for identification and protection of instream flows for native fish. Water conservation practices will be implemented to provide additional habitat in areas which have been previously dewatered. These goals are consistent with the Virgin River Fishes Recovery Plan (USFWS 1992) and supported by

seven years of biological studies paid for by the WCWCD, the State of Utah, and the USFWS.

The program would establish the mechanism needed to provide funds for compensating private property owners within the floodplain; enhancing wetlands; removing non-native fish that cause problems to native fish from the river system; and through water conservation, provide instream flows.

The VRBIRM&RP would also provide certainty in the development of the water resources to meet the needs of a growing Washington County, while providing for recovery of listed fish, and would allow incidental take that may occur as a result of the operation of existing diversion dams.

CHAPTER 10.0
ALTERNATIVES CONSIDERED

The proposed HCP described in this document includes a proposed reserve design which was developed through a process of (1) biological evaluation of original and literature data, as the plan must meet the needs of the species and present a reasonable prospect for conservation accomplishments; (2) acceptance of political reality, as the plan must have the support of the principal affected parties in order to succeed; and (3) determination of financial feasibility, as the plan must be affordable. These are three essential elements of any HCP, without which a plan cannot succeed. Each specific issue in this plan, including the proposed reserve design, was thoroughly debated by the Steering Committee, and the proposed plan contained within this document represents a compromise that reflects the above three elements. The process of compromise requires that the best reserve design from a biological standpoint must be politically acceptable and affordable, and that the most politically acceptable plan must also result in a biologically viable reserve. This process of compromise is unlikely to maximize any one of the essential elements. In the case of the proposed Washington County HCP, this process of compromise has resulted in a biologically viable reserve that is politically acceptable. This is the best that could be accomplished through this Steering Committee process and undoubtedly was the intent of Congress in providing for Section 10(a) permits.

Several viable alternatives were considered by the Steering Committee in development of this HCP; these are considered in detail in the accompanying Environmental Impact Statement (EIS). This chapter presents an overview of each of the five alternatives to the proposed action (the HCP described in the preceding chapters) that are considered within the EIS and the rationale for selecting the Proposed Alternative.

10.1 NO ACTION

The No Action Alternative would be a continuation of the current situation in Washington County without an HCP and Section 10(a)(1)(B) permit for incidental take of desert tortoises and without any effective conservation program implemented by local, State, or Federal agencies. Currently, several land development projects are underway and several projects are pending the outcome of this HCP process. Others do not directly impact desert tortoise habitat, but the cumulative impact will reduce the viability of this Recovery Unit. Under the No Action Alternative, loss of habitat is likely to continue, a regional HCP would not be developed, opportunities for habitat conservation on a county-wide or Recovery Unit scale would be lost, and adverse, indirect impacts to desert tortoises would continue without mitigation or compensation. Therefore this alternative was considered unacceptable by the Steering Committee.

10.2 NO DEVELOPMENT IN TORTOISE HABITAT

Less than 10 percent of Washington County is desert tortoise habitat. There is adequate land in the County, much of which is currently agricultural, that is not habitat and

developable without benefit of this HCP. However, growth in the County has been concentrated in desert tortoise habitat because of favorable soils and scenic resources. Significant financial, planning, and infrastructure resources have been invested by the County and cities to accommodate growth in these areas. This alternative is considered unacceptable due to previous infrastructure commitments, the growth in habitat areas, and the fact that many of these areas are not particularly important to the long-term survival of the Mojave desert tortoise in this Recovery Unit. Again, this alternative would not result in any effective conservation measures in this Recovery Unit, thereby not increasing the likelihood of recovery of the Mojave desert tortoise in southwesterrn Utah.

10.3 NO DEVELOPMENT IN TORTOISE HABITAT, BUT LANDOWNERS COMPENSATED

This alternative is similar to the one described above, but all landowners would be compensated for the loss of use of their land. There are approximately 39,750 acres of tortoise habitat currently in the North St. George DWMA which are not Federally owned or part of Snow Canyon State Park. To compensate these landowners at an estimated value of $5.000 per acre would require approximately $200 million. This is not considered feasible given current Federal budgetary constraints. Further, the proposed HCP includes compensation for landowners with important desert tortoise habitat through land exchange. Because the financial requirements of this alternative are unfeasible, it is unlikely to ever be implemented. Habitat would continue to be developed or degraded, and no conservation measures would be implemented in this Recovery Unit.

10.4 RESERVE CONSISTING ONLY OF ZONES 3, 4, AND 5

This reserve design would be similar to that proposed in the HCP for all areas east of Highway 18. West of Highway 18 would all be identified for incidental take. The rationale for this alternative is that tortoise habitat west of Highway 18 is fragmented by a number of roads and other existing developments which may already threaten its long-term biological viability for desert tortoises. As stated in Chapter 7, Zone 3 represents the portion of the reserve which best meets the reserve design criteria. Zones 1 and 2 present substantial barriers to tortoise movement which will require significant management actions to enhance viability. This alternative was not selected because it proposed a large amount of incidental take in comparison to the reserve size. Although Zones 1 and 2 partially compromise the reserve design criteria, it was the opinion of the TAC that Zones 1 and 2, with appropriate rehabilitation and management, should be included in the overall reserve design in order to enhance the prospects of reserve viability and ultimate recovery of the species.

10.5 A LARGER RESERVE (61,769 ACRES)

The TAC had recommended several changes in the proposed reserve design which they believed would create a more viable reserve. These changes would include the following:

Zone 2:	Including a 30-acre parcel east of the National Institute of Fitness.
Zone 3:	Making the northeast boundary the Red Cliffs Road rather than the western private property boundary.
Zone 4:	Including all the private property within the outer boundary.
Zone 5:	Including all the private land west of the western edge of the reserve to Gould's Wash.

These changes would increase the size of the reserve by an estimated 800 acres, increasing the amount of habitat within the reserve approximately 2 percent. None of the above changes in reserve design would significantly improve the viability of the reserve. All of the above changes would, however, involve significant political impediments to the plan since the landowners involved were unwilling to participate. The Steering Committee did not choose to adopt this alternative since it did not improve the viability of the reserve and would have incorporated unresolvable political conflicts.

The Proposed Alternative contained in this document represents the best efforts of the Steering Committee to develop a compromise plan that meets the essential needs of the affected parties and is biologically sound, politically acceptable, and financially feasible. It is the opinion of the Steering Committee that the proposed HCP represents the only realistic prospect for conservation and recovery of the Mojave desert tortoise in the Upper Virgin River Recovery Unit.

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INDEX

APPENDIX A

UTILITY DEVELOPMENT PROTOCOLS

The following protocols have been developed to minimize potential adverse impacts to the Mojave desert tortoise in preserve areas from utility and road right-of-way projects, such as the installation and maintenance of water, sewer, and electric lines and roadway maintenance, while still enabling utilities to be placed within the preserve. These protocols apply only to the site preparation and construction phases of projects. Utility design and alignment will be developed through Section 7 consultations (public lands or federal nexus projects) and appropriate environmental review for projects on private lands. The reserve will be considered an avoidance area for the location of new utilities. This means new utilities will be encouraged to co-locate along existing infrastructure when practical. The HCAC will review other new utilities routes to assure minimum habitat disturbance.

I. WATER EXPLORATION, CONSTRUCTION, OPERATION, AND MAINTENANCE

New water development is critical to the continued economic growth of the communities in Washington County. New water development includes exploration, construction, operation, and maintenance for water tanks, wells, pumps, water pipelines, electric lines to serve pumps, and access roads. Access roads must be maintained in primitive condition. The following terms are established to protect the desert tortoise during groundwater development in non-take areas:

1. A contact person from the entity performing the construction shall act as the contact representative to the Service (under a Section 7 consultation) or the HCP Administrator (under a non-federal action). He/she will be responsible for overseeing compliance with the protective stipulations as stated in this protocol.

2. Prior to any construction activity within the preserve, the contact person will meet with the HCP Biologist to review the plans for the project. The HCP Biologist, in consultation with the TC, will review alignment, pole spacing, clearing limits, burrow locations, and other project specific details which have the potential to affect the desert tortoise. The HCP Biologist may recommend modifications to the contact person in order to further avoid or minimize potential impacts to Mojave desert tortoise and to better meet this protocol. If there are unresolvable conflicts between the HCP Biologist and the contact person, then the matter will be arbitrated by the HCAC and, if necessary, by the Washington County Commission.

3. All pre-construction activities which could take tortoises in any manner (e.g., driving off an established road, clearing vegetation, etc.) shall occur under the overall supervision of a qualified biologist. Any hazards to tortoises that may be created by this activity, such as drill holes or any steep-sided depressions, shall be checked three times a day for desert tortoises. These hazards shall be eliminated each day prior to the work crew leaving the site, which may include installing a barrier that will preclude entry by tortoises.

    A. A qualified biologist shall conduct pre-construction clearance surveys of all areas potentially disturbed by the proposed project. Any winter dens discovered during

the pre-construction survey shall be avoided or mitigated. The survey shall be submitted to the HCP Biologist as part of plan review.

B. All site mitigation criteria shall be determined in the pre-construction phase, including but not limited to seeding, barrier fences, leveling, laydown/staging areas, and will be reviewed by the HCP Biologist, in consultation with the TC, prior to implementation.

4. The entity shall ensure that during construction their contractors comply with the mitigation measures contained within this protocol. These measures are:

A. A qualified biologist shall oversee construction activities to ensure compliance with the protective stipulations for the desert tortoise, and a biological monitor will be assigned to each group of construction equipment.

B. Any desert tortoises found within the project area during construction shall be moved by a qualified biologist out of harm's-way (at a distance no greater than 250 feet).

C. Open trenches will be backfilled within 72 hours, whenever possible. All open trenches shall be checked three times a day for trapped desert tortoises. If a desert tortoise is found in the trench, the biological monitor shall notify the qualified biologist who will remove the animal as soon as possible. A 3:1 slope shall be left at the end of every open trench to allow trapped desert tortoises to escape. Trenches not backfilled within 72 hours shall have a barrier installed around them to preclude entry by desert tortoises.

D. Desert tortoise burrows shall be avoided to the maximum extent feasible. A qualified biologist shall excavate any burrows which cannot be avoided and will be disturbed by construction. Burrow excavation shall be conducted with the use of hand tools only, unless a fibre-optic scope is used which reveals that the burrow is unoccupied immediately prior to burrow destruction.

E. All water pipes stored within desert tortoise habitat shall have both ends capped to prevent entry by desert tortoises. During construction, all open ended pipeline segments that are welded in place shall be capped during periods of construction inactivity to prevent entry by desert tortoises.

F. A worker education program shall be implemented prior to the onset of construction. All construction employees and visitors shall be required to read an educational brochure prepared by the HCP Administrator and attend a tortoise education class prior to the onset of construction or site entry. The class will describe the sensitive species which may be found in the area, the purpose of the preserve, and the appropriate measures to take upon discovery of a sensitive

species. It will also cover construction techniques to minimize potential adverse impacts. All project personnel shall sign an affidavit that they have read and understand the material presented in the brochure and class.

G. Topsoil removed during trenching shall be re-spread on the pipeline construction area following compaction of the backfill. The area shall be restored as determined during the environmental review.

H. All test pump water will be routed to the nearest wash or natural drainage. The route will be surveyed by the biological monitor. If tortoises are found in the drainage area the qualified biologist will remove the tortoises.

I. Equipment maintenance and staging areas, and storage areas for pipes, wires, etc. will be located outside of preserve areas.

5. The construction area shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of construction activities. The construction right-of-way shall normally not exceed 50 feet in width for standard pipeline corridors, and should be minimized to the maximum extent practicable. Other construction areas including well sites, storage tank sites, turnarounds, and laydown/staging sites which require larger areas will be determined in the pre-construction phase. All construction workers shall be instructed that their activities shall be confined to locations within the fenced, flagged, or marked areas.

6. Work areas shall be inspected for desert tortoises within 24 hours of the onset of construction. To facilitate implementation of this condition, burrow inspection and excavation may begin no more than seven (7) days in advance of construction activities, as long as a final check for desert tortoises is conducted at the time of construction.

7. Any burrows in the path of construction shall be checked for desert tortoise. Unoccupied burrows which can not be avoided shall be destroyed at that time. If the burrow is occupied and can not be avoided during construction, the burrow shall be excavated by hand and the desert tortoise moved up to 250 feet from where it was found and placed in a natural burrow of similar shape and size. If a natural burrow is unavailable, the desert tortoise shall be placed in a hand excavated burrow of the same size, shape, depth and orientation as the one in which it was found.

8. Only burrows within the limits of clearing and surface disturbance shall be excavated. Burrows outside these limits, but at risk from accidental crushing, shall be protected by the placement of deterrent fencing between the burrow and the construction area. The fencing shall be at least 20 feet long and shall be installed to direct the tortoise leaving the burrow away from the construction area. Installation and removal of such fencing shall be under the direction and supervision of the biological monitor.

9. Any tortoise found above ground and not near the mouth of its burrow shall be moved up to 250 feet from where it was found and placed in the shade of a shrub.

10. All trenches, pits, or other excavations shall be inspected for tortoises by the biological monitor prior to filling. These areas shall be inspected at least three times a day while they remain open. If any desert tortoises are found, they shall be carefully moved by the qualified biologists.

11. All trash and food items shall be promptly contained and regularly removed from the project site to reduce the attractiveness of the area to common ravens and other desert tortoise predators.

12. Construction activities which occur between dusk and dawn shall be limited to areas which have already been cleared of desert tortoises by the qualified biologist and graded. Construction activities shall not be permitted between dusk and dawn in areas not previously graded.

13. No handling of tortoises will occur when the air temperature at 15 centimeters above ground exceeds 90 degrees Fahrenheit.

14. Tortoises are not to be removed from burrows from November 1 through March 15 until appropriate action is determined by the Service with respect to the tortoises. The Service response shall be carried out within 72 hours.

15. If blasting is necessary for construction, all tortoises shall be removed from burrows within 100 feet of the blast area.

16. Powerlines associated with water development, such as to provide power for pumps, should be buried underground adjacent to the pipe. All above ground structures deemed to be necessary shall be equipped with functional anti-perching devices that would prevent their use by ravens and other predatory birds, and shall adhere to the electrical distribution protocol which follows.

17. In order to perform routine operation and maintenance of the water systems such as wells, pumps, water lines and storage tanks, etc., employees are to be trained in the area of desert tortoise education. This training will be performed on a regular basis by a qualified biologist for those personnel not previously trained. The training will include at a minimum the following: identification of tortoises, burrows, and other sign; and instructions on installing tortoise fencing. During the course of basic operation and maintenance desert tortoise will be avoided if at all possible. Non-trained employees shall not perform maintenance operations within the preserve areas.

II. ELECTRIC DISTRIBUTION LINES CONSTRUCTION AND MAINTENANCE

The following protocol are for the maintenance and construction of electric distribution lines. These protocol apply only to site preparation and construction phases of projects. Facilities covered as part of these protocols include above ground poles, transmission lines, substations, and access roads. Access roads must be maintained in primitive condition. The following terms are established to protect the desert tortoise during electrical distribution development in preserve areas:

1. A contact person from the entity performing the construction shall act as the contact representative to the Service (under a Section 7 consultation) or the HCP Administrator (under a non-federal action). He/she will be responsible for overseeing compliance with the protective stipulations as stated in this protocol.

2. Prior to any construction activity within the preserve, the contact person will meet with the HCP Biologist to review the plans for the project. The HCP Biologist, in consultation with the TC, will review alignment, pole spacing, clearing limits, burrow locations, and other project specific plans which have the potential to affect the desert tortoise. The HCP Biologist may recommend modifications to the contact person in order to further avoid or minimize potential impacts to Mojave desert tortoise and to better meet this protocol. If there are unresolvable conflicts between the HCP Biologist and the contact person, then the matter will be arbitrated by the HCAC and, if necessary, by the Washington County Commission.

3. All pre-construction activities which could take tortoises in any manner (e.g., driving off an established road, clearing vegetation, etc.) shall occur in the presence of a qualified biologist. Any hazards to tortoises created by this activity, such as drill holes or any steep-sided depressions, shall be checked three times a day for desert tortoises. These hazards shall be eliminated each day prior to the work crew leaving the site, which may include installing a barrier that will preclude entry by desert tortoises.

   A. A qualified biologist shall conduct pre-construction clearance surveys of all areas potentially disturbed by the proposed project. Any winter dens discovered during the pre-construction survey shall be avoided or mitigated. The survey shall be submitted to the HCP Biologist as part of plan review.

   B. All site mitigation criteria shall be determined in the pre-construction phase, including but not limited to seeding, barrier fences, leveling, laydown/staging areas, and will be reviewed by the HCP Biologist, in consultation with the TC, prior to implementation.

4. The entity shall ensure that during construction their contractors comply with the mitigation measures contained within this protocol. These measures are:

A. A qualified biologist shall oversee construction activities to ensure compliance with the protective stipulations for the desert tortoise, and a biological monitor will be assigned to each group of construction equipment.

B. Any desert tortoises which are found within the project area during construction shall be moved by a qualified biologist out of harm's-way (at a distance no greater than 250 feet).

C. Open pits for transmission poles will be backfilled within 72 hours, whenever possible. All open pits shall be checked three times a day for trapped desert tortoises. If a desert tortoise is found in the pit, the biological monitor shall notify the qualified biologist to have the animal removed. Pits that are not backfilled within 72 hours shall have a barrier installed around them that will preclude entry by desert tortoises.

D. Where an area will be cleared for installation of a larger pole or for a concrete pad, the disturbance area will be minimized to the maximum extent practicable, and temporary tortoise-proof fencing will be erected around the work area.

E. Desert tortoise burrows shall be avoided to the maximum extent feasible. A qualified biologist shall excavate any burrows which cannot be avoided and will be disturbed by construction. Burrow excavation shall be conducted with the use of hand tools only, unless a fibre-optic scope is used which reveals that the burrow is unoccupied immediately prior to burrow destruction.

F. Equipment maintenance and staging areas, and storage areas for poles, wire, etc., will be located outside of preserve areas.

G. A worker education program shall be implemented prior to the onset of construction. All construction employees and visitors shall be required to read an educational brochure prepared by the HCP Administrator and attend a tortoise education class prior to the onset of construction or site entry. The class will describe the sensitive species which may be found in the area, the purpose of the preserve, and the appropriate measures to take upon discovery of a sensitive species. It will also cover construction techniques to minimize potential adverse impacts. All project personnel shall sign an affidavit that they have read and understand the material presented in the brochure and class.

H. Areas impacted during the drilling of pole holes or construction of pads will be restored as determined during the pre-construction process.

5. The construction area shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of construction activities. The construction right-of-way shall normally not exceed 50 feet in width for standard access road and transmission corridors,

and should be further minimized to the maximum extent practicable. Existing access roads should be used to the maximum extent possible, and rights-of-way for new and existing access roads should normally not exceed 20 feet. Other construction areas including substation sites, storage/staging sites, and turnarounds which require larger areas will be determined in the pre-construction phase. All construction workers shall be instructed that their activities shall be confined to locations within the fenced, flagged, or marked areas.

6. Work areas shall be inspected for desert tortoises within 24 hours of the onset of construction. To facilitate implementation of this condition, burrow inspection and excavation may begin no more than seven (7) days in advance of construction activities, as long as a final check for desert tortoises is conducted at the time of construction.

7. Any burrows in the path of construction shall be checked for desert tortoise. Unoccupied burrows which can not be avoided shall be destroyed at that time. If the burrow is occupied and can not be avoided during construction, the burrow shall be excavated by hand and the desert tortoise moved up to 250 feet from where it was found and placed in a natural burrow of similar shape and size. If a natural burrow is unavailable, the desert tortoise shall be placed in a hand excavated burrow of the same size, shape, depth and orientation as the one in which it was found.

8. Only burrows within the right-of-way shall be excavated. Burrows outside the right-of-way, but which could be at risk from accidental crushing, shall be protected by the placement of deterrent fencing between the burrow and the right-of-way. The fencing shall be at least 20 feet long and shall be installed to direct the tortoise leaving the burrow away from the right-of-way. Installation and removal of such fencing shall be under the direction and supervision of the biological monitor.

9. Any tortoise found above ground, not near the mouth of its burrow, and in harm's-way, shall be moved up to 250 feet from where it was found and placed in the shade of a shrub.

10. All pits or other excavations shall be inspected for desert tortoises by the biological monitor prior to filling. These areas shall be inspected at least three times a day while they remain open. If any desert tortoises are found, they shall be carefully moved by the qualified biologists.

11. All trash and food items shall be promptly contained and regularly removed from the project site to reduce the attractiveness of the area to common ravens and other desert tortoise predators.

12. Construction activities which occur between dusk and dawn shall be limited to areas which have already been cleared of desert tortoises by the qualified biologist and graded.

Construction activities shall not be permitted between dusk and dawn in areas not previously graded.

13. No handling of tortoises will occur when the air temperature at 15 centimeters above ground exceeds 90 degrees Fahrenheit.

14. Tortoises are not to be removed from burrows from November 1 through March 15 until appropriate action is determined by the Service with respect to the tortoises. The Service response shall be carried out within 72 hours.

15. If blasting is necessary for construction, all tortoises shall be removed from burrows within 100 feet of the blast area.

16. Poles or other above ground structures necessary for electrical distribution development shall be minimized as much as possible. All above ground structures shall be equipped with functional anti-perching devices that would prevent their use by ravens and other predatory birds.

17. In order to perform routine operation and maintenance of the electrical distribution systems such as transmission lines and poles, substations, etc., employees are to be trained in the area of desert tortoise education. This training will be performed on a regular basis by a qualified biologist for those personnel not previously trained. The training will include at a minimum the following: identification of tortoises, burrows, and other sign; and instructions on installing tortoise fencing. During the course of basic operation and maintenance desert tortoise will be avoided if at all possible. Non trained employees shall not perform maintenance operations within the non-take areas.

III. ROADWAY MAINTENANCE AND IMPROVEMENTS

Roadway maintenance and improvements are allowed in preserve areas for the purposes of repairing and upgrading roadways within defined rights-of-way. Public access roadways within the proposed preserve include Highway 18, Snow Canyon Road, Tuacahn Road, and Skyline Drive. Highway 18 has a 200-foot right-of-way which will be fenced. Skyline Drive will also be fenced, while Snow Canyon Road and Tuacahn Road are not proposed for fencing.

The protocols contained in this section apply to these four roadways within their existing rights-of-way. However it is recognized that Skyline Drive may be re-aligned in the future, thus altering the location of its right-of-way from its current position. These protocol apply only to site preparation and construction phases of projects.

The following terms are established to protect the desert tortoise during road maintenance in non-take areas:

1. A contact person from the entity performing the construction shall act as the contact representative to the Service (under a Section 7 consultation) or the HCP Administrator (under a non-federal action). He/she will be responsible for overseeing compliance with the protective stipulations as stated in this protocol.

2. Prior to any construction activity within the preserve, the contact person will meet with the HCP Biologist to review the plans for the project. The HCP Biologist, in consultation with the TC, will review alignment, pole spacing, clearing limits, burrow locations, and other project specific plans which have the potential to affect the desert tortoise. The HCP Biologist may recommend modifications to the contact person in order to further avoid or minimize potential impacts to Mojave desert tortoise and to better meet this protocol. If there are unresolvable conflicts between the HCP Biologist and the contact person, then the matter will be arbitrated by the HCAC and, if necessary, by the Washington County Commission.

3. All pre-construction activities which could take tortoises in any manner (e.g., driving off an established road, clearing vegetation, etc.) shall occur under the overall supervision of a qualified biologist. Any hazards to tortoises that may be created by this activity, such as drill holes or any steep-sided depressions, shall be checked three times a day for desert tortoises. These hazards shall be eliminated each day prior to the work crew leaving the site, which may include installing a barrier that will preclude entry by tortoises.

   A. A qualified biologist shall conduct pre-construction clearance surveys of all areas potentially disturbed by the proposed project. Any winter dens discovered during the pre-construction survey shall be avoided or mitigated. The survey shall be submitted to the HCP Biologist as part of plan review.

   B. All site mitigation criteria shall be determined in the pre-construction phase, including but not limited to seeding, barrier fences, leveling, laydown/staging areas, and will be reviewed by the HCP Biologist, in consultation with the TC, prior to implementation.

4. The entity shall ensure that during construction their contractors comply with the mitigation measures contained within this protocol. These measures are:

   A. A qualified biologist shall oversee construction activities to ensure compliance with the protective stipulations for the desert tortoise, and a biological monitor will be assigned to each group of construction equipment if the project is not within a fenced right-of-way.

   B. Any desert tortoises which are found within the project area during construction shall be moved by a qualified biologist out of harm's-way.

C. If not within a fenced right-of-way, all open pits and trenches will be backfilled within 72 hours, whenever possible. All open pits and trenches shall be checked three times a day for trapped desert tortoises. If a desert tortoise is found in a pit or trench, the biological monitor shall notify the qualified biologist to have the animal removed. A 3:1 slope shall be left at the end of every open trench to allow trapped desert tortoises to escape. Pits or trenches not backfilled within 72 hours shall have a barrier installed around them to preclude entry by desert tortoises.

D. Desert tortoise burrows shall be avoided to the maximum extent feasible. A qualified biologist shall excavate any burrows which cannot be avoided and will be disturbed by construction. Burrow excavation shall be conducted with the use of hand tools only, unless a fibre-optic scope is used which reveals that the burrow is unoccupied immediately prior to burrow destruction.

E. All culvert or open pipes stored within desert tortoise habitat (and not within a fenced right-of-way) shall have both ends capped to prevent entry by desert tortoises. During construction, all open ended culvert or pipe segments that are welded in place shall be capped during periods of construction inactivity to prevent entry by desert tortoises.

F. A worker education program shall be implemented prior to the onset of construction. All construction employees and visitors shall be required to read an educational brochure prepared by the HCP Administrator and attend a tortoise education class prior to the onset of construction or site entry. The class will describe the sensitive species which may be found in the area, the purpose of the preserve, and the appropriate measures to take upon discovery of a sensitive species. It will also cover construction techniques to minimize potential adverse impacts. All project personnel shall sign an affidavit that they have read and understand the material presented in the brochure and class.

G. The area shall be restored as determined during the pre-construction process.

5. The construction area shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of construction activities. The construction right-of-way shall normally not exceed that specified above. In some cases, storage areas for materials and equipment, turnarounds, and staging sites which require larger areas will be determined in the pre-construction phase. All construction workers shall be instructed that their activities shall be confined to locations within the fences, flagged, or marked areas.

6. Work areas shall be inspected for desert tortoises within 24 hours of the onset of construction. To facilitate implementation of this condition, burrow inspection and excavation may begin no more than seven (7) days in advance of construction activities, as long as a final check for desert tortoises is conducted at the time of construction.

7. Any burrows in the within the construction area shall be checked for desert tortoise. Unoccupied burrows which can not be avoided shall be destroyed at that time. If the burrow is occupied and can not be avoided during construction, the burrow shall be excavated by hand and the desert tortoise moved up to 250 feet from where it was found and placed in a natural burrow of similar shape and size. If a natural burrow is unavailable, the desert tortoise shall be placed in a hand excavated burrow of the same size, shape, depth and orientation as the one in which it was found.

8. Only burrows within the right-of-way shall be excavated. Burrows outside the right-of-way, but which could be at risk from accidental crushing, shall be protected by the placement of deterrent fencing between the burrow and the right-of-way. The fencing shall be at least 20 feet long and shall be installed to direct the tortoise leaving the burrow away from the right-of-way. Installation and removal of such fencing shall be under the direction and supervision of the biological monitor.

9. Any tortoise found above ground, not near the mouth of its burrow, and in harm's-way, shall be moved up to 250 feet from where it was found and placed in the shade of a shrub.

10. All trenches, pits, or other excavations shall be inspected for desert tortoises by the biological monitor prior to filling. These areas shall be inspected at least three times a day while they remain open, if they are not within a fenced right-of-way. If any desert tortoises are found, they shall be carefully moved by the qualified biologists.

11. All trash and food items shall be promptly contained and regularly removed from the project site to reduce the attractiveness of the area to common ravens and other desert tortoise predators.

12. Construction activities which occur between dusk and dawn shall be limited to areas which have already been cleared of desert tortoises by the qualified biologist and graded, or are located within a fenced right-of-way. Construction activities shall not be permitted between dusk and dawn in areas not previously graded or fenced.

13. No handling of tortoises will occur when the air temperature at 15 centimeters above ground exceeds 90 degrees Fahrenheit.

14. Tortoises are not to be removed from burrows from November 1 through March 15 until appropriate action is determined by the Service with respect to the tortoises. The Service response shall be carried out within 72 hours.

15. If blasting is necessary for repairs, all tortoises shall be removed from burrows within 100 feet of the blast area.

IV. DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

Upon locating dead, injured, or sick desert tortoises under any utility or road project, initial notification by the entity or its agent must be made to the USFWS and The Utah Division of Wildlife Resources within three working days of its finding. Written notification must be made within 5 calendar days with the following information: date; time; location of the carcass; photograph of the carcass; and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care. Injured animals shall be taken care of by the qualified biologist. Should any treated tortoises survive, the USFWS and the Utah Division of Wildlife Resources should be contacted regarding the final disposition of the animals.

V. DEFINITIONS

A. Qualified biologist - As a general rule, a qualified desert tortoise biologist is defined as a person with a bachelors degree or graduate degree in biology, ecology, wildlife biology, herpetology, or related fields. He/she must have demonstrated prior field experience using accepted resource agency techniques to survey for desert tortoises. Field experience may mean a minimum of 60 days field experience searching for tortoises and tortoise sign. The qualified biologist is they only person that can handle the tortoises.

B. Biological monitor - The biological monitor has a specific training on the biology and habits of the desert tortoise. This person is not permitted to handle the tortoises. When a tortoise is identified for removal by the biological monitor he/she will call upon the qualified biologist to remove the tortoise. It is preferable that the biological monitor has some background in biology.

C. Barrier fence - A fence designed to protect the desert tortoise from harm.

D. Educational brochure - A brochure intended to explain to construction crews as well a visitors the desert tortoise and their habitat which are found within the area. The brochure will also explain the appropriate measures to take if a desert tortoise or burrow is located or accidently harmed.

E. Burrow - A temporary cover site in soil that the desert tortoise excavates.

F. Winter den - A permanent structure that is inhabited by desert tortoise during hibernation. The winter den is usually in solid rock or sometimes in soil. The winter dens are to be avoided or mitigated during the pre-construction phase.

G. Acceptance criteria - Prior to construction of surface disturbances in non-take areas the Service will be notified of the new project. After the Service reviews the project an acceptance criteria will be issued. The acceptance criteria will be issued in accordance with the terms of the water development protocol.