



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE  
2369 WEST ORTON CIRCLE, SUITE 50  
WEST VALLEY CITY, UTAH 84119

June 25, 2014

In Reply Refer To:

FWS/R6  
ES/UT  
6-UT-14-F-018  
2014-F-0051

Memorandum

To: Superintendent, Bryce Canyon National Park, National Park Service, Bryce Canyon, Utah

From: Utah Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, West Valley City, Utah

Re: Final Biological Opinion for the Multi-Modal Transportation Plan, Bryce Canyon National Park

In accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), this transmits the U.S. Fish and Wildlife Service's (USFWS or Service) final biological opinion (BO) for impacts to the Utah prairie dog (*Cynomys parvidens*) from the Multimodal Transportation Plan at Bryce Canyon National Park. We received a final biological assessment (BA) for the Project via email on January 16, 2014.

The Utah prairie dog is federally listed as a threatened species and occurs within the proposed Project area. This biological opinion is based on information provided in the January 16, 2014 BA, your supplemental letter of April 29, 2014, and email and phone communications between our offices. A complete administrative record of this consultation is on file at this office.

## **CONSULTATION HISTORY**

*Dec 18, 2012-May 21, 2013*

We attended several on-site meetings and participated in several telephone conference calls with the National Park Service (NPS) discussing this project.

*January 16, 2014-*

We received the BA for the project from the NPS.

*May 2, 2014-*

We received a supplemental letter (dated April 29, 2014) to the BA from your office, identifying the direct permanent impacts to Utah prairie dogs and your commitment to mitigation.

## **BIOLOGICAL OPINION**

### **1 DESCRIPTION OF THE PROPOSED ACTION**

#### **1.1 ACTION AREA**

Bryce Canyon National Park (Park) is located within Garfield and Kane counties, UT. The action area includes the north end of the Park (see Figure 9 in the BA) from Bryce and Inspiration points west to the main park road (SR-63), and all improved areas of the Park north to the park boundary. The action area includes a 350 foot buffer around all temporary disturbances and improvements described in the BA, and a 0.5 mile buffer around all permanent structures and improvements described in the BA; these buffers represent the zone of influence of project impacts to the Utah prairie dog.

#### **1.2 PROPOSED ACTION**

Bryce Canyon National Park is proposing a Multimodal Transportation Plan. The purpose of the proposed 20-year plan is to provide the park with short and long-term strategies to improve the overall transportation system by reducing congestion and safety concerns on roadways, in parking lots, on the shuttle, and at key visitor destinations. Under the maximum build out scenario, up to 19 acres of Utah prairie dog habitat will be permanently lost. A complete description of the proposed action is found within the January 2014 BA (Section 3.1)

#### **1.3 APPLICANT COMMITTED CONSERVATION MEASURES**

The following conservation measures will be implemented by the project proponent for all construction, operation and maintenance activities:

- General conservation measures included in the Park's Utah Prairie Dog Stewardship Plan (in process, the Finding of No Significant Impact expected July 2014) will be incorporated into best management practices to reduce and mitigate any associated impacts to colonies during and following construction related to transportation management planning. These measures will be implemented in a proactive manner to address road mortality, habitat fragmentation, impacts from noise disturbance, and human habituation. Management actions could include, but are not limited to, installation of vegetative and physical barriers, enhanced movement

corridors via clearing, addition, expansion of underground culverts, temporary road closures, interpretive material such as wayside exhibits, and speed-calming measures.

- During construction in areas adjacent to active Utah prairie dog colonies (including the new multimodal hub across from the Historic Service Station and / or the tour bus holding area along the Lodge Loop Road and improvements near the Visitor Center), the park will install a visual barrier surrounding the Utah prairie dog colony to deter road crossings and reduce the impacts of construction traffic and activity on the colony. Movement between colonies that are bisected by roads will be enhanced via clearing out underground drainage culverts prior to installation of visual barriers. Visual barriers may be removed following construction, or a more permanent barrier (e.g., metal fence or rock wall with an underground barrier) may be constructed depending on monitoring results.
- The park will monitor Utah prairie dog behavior during and following construction activities in areas within 350 feet of active colonies, including the following areas: Dave's Hollow West, Dave's Hollow East, Historic Housing, and Sunset Point (if active). If roadkill mortalities increase from baseline conditions (at a level >10% or other increase percentage as determined in consultation with the USFWS), the park would implement conservation measures to further protect colonies. Mitigation measures will be determined through consultation with the USFWS and follow recommendations as outlined in the Park's Utah Prairie Dog Stewardship Plan.
- Construction activities within 350 feet of an active Utah prairie dog colony will be monitored by the Park's biologist or qualified staff. Monitoring would occur no less than eight hours per colony in 2-hour (or greater) observation increments. A monitoring plan will be developed by the park and submitted for approval by the USFWS prior to implementation of any proposed improvements under the Proposed Action. Activities that have an observably detrimental impact on Utah prairie dog colonies and which extend beyond acceptable impacts as outlined in the Biological Opinion for this project would cause cessation of construction and result in re-consultation with the USFWS on the Proposed Action.
- Construction workers and supervisors would be informed about the status of the Utah prairie dog and appropriate activities around active colonies. Contract provisions would require the cessation of construction activities that have a detectably detrimental effect on Utah prairie dogs in the project area, until the park's biologist re-evaluates the project and its impact on the prairie dog. This may include modification of the contract for any determined protection measures, which may include timing or equipment restrictions.
- No construction equipment will be stored within 500 feet of an active colony or within mapped Utah prairie dog habitat in the park.
- All conservation measures from the Biological Opinion will be incorporated into project implementation, which may include timing restrictions near Utah prairie dog habitat, as well as other conservation measures.

### **1.3.1 Mitigation**

Bryce Canyon National Park is working on a Utah Prairie Dog Stewardship Plan (FONSI to be signed in 2014). The Park commits to managing at least 500 acres of habitat for Utah prairie dogs in perpetuity. This commitment will offset the permanent loss (19 acres) of Utah prairie dog habitat under the maximum build out scenario in the Multimodal Transportation Plan.

## **2 STATUS OF THE SPECIES/ CRITICAL HABITAT**

The range wide status of the Utah prairie dog is provided in Appendix A; including information on the species' listing history, life history, population dynamics, status and distribution, and recovery efforts. There is no designated critical habitat for this species.

## **3 ENVIRONMENTAL BASELINE**

The Project will occur within the Paunsaugunt Recovery Unit (RU). The Paunsugunt RU occurs primarily in Garfield County, but extends into southern Piute County and northern Kane County. The Paunsugunt RU supports approximately 26% all surveyed adult Utah prairie dogs (1,895 of 7,269) (UDWR 2014), with 42% on public and protected lands. The total mapped habitat across the range of the species is 69,860 acres with 15,620 acres (23% of total) in the Paunsaugunt RU (UDWR 2014).

### **3.1 STATUS OF THE SPECIES WITHIN THE ACTION AREA**

Staff at Bryce Canyon National Park census the entire Utah Prairie Dog population within the Park's boundaries annually. There are 135.9 acres of Utah prairie dog habitat (occupied and unoccupied) within a 0.5 mile buffer surrounding the proposed development areas, and 19 acres of Utah prairie dog habitat (occupied and unoccupied) within a 350 foot buffer surrounding the proposed development areas.

To estimate the number of Utah prairie dogs that may be located within the Action Area, we used the NPS 2013 spring count data (total adults counted in the spring) (Table 3 in the BA). There were 38 adults counted in the spring of 2013 in occupied habitat with the Action Area (including 0.5 mile and 350 foot buffers).

Adult population estimates are made based on the number of individual adult Utah prairie dogs observed during survey efforts. The adult population estimate is derived by multiplying the count by two, as only 40 to 60 percent of individual prairie dogs are above ground at any one time (Crocker-Bedford 1976).

$$\text{Adult Population Estimate} = 2 \times (\text{Adult Spring Count})$$

$$76 = 2 \times 38 \text{ (2013 Adult Spring Count)}$$

Using the above equation and the spring adult counts from the 2013 surveys, the adult population estimate is 76 Utah prairie dogs. In the summer, pup production can increase this number to approximately 274 Utah prairie dogs (see equation below and more detailed biological information in the Utah Prairie Dog Recovery Plan, USFWS 2012).

Population Estimate (with productivity) =

$$[(2 \times \text{Adult Spring Count}) \times 0.67 \text{ (proportion of adult females)} \times 0.97 \\ (\text{proportion of breeding females}) \times 4 \text{ (average number of young per} \\ \text{breeding female)}] + (2 \times \text{Adult Spring Count})$$

$$\begin{aligned}\text{Population Estimate (with productivity)} &= [(2 \times 38) \times 0.67 \times 0.97 \times 4] + (2 \times 38) \\ &= 274 \text{ Utah prairie dogs}\end{aligned}$$

### **3.2 FACTORS AFFECTING THE SPECIES ENVIRONMENT WITHIN THE ACTION AREA**

From 2008-2013 the Park has kept observational records on Utah prairie dog mortalities. Seventy-eight mortalities were observed during that period, 97% of which were a result of vehicle strikes. There is a high proximity of prairie dog meadow habitat alongside roadways. Subsequently these Utah prairie dogs are exposed to human activity, vehicle traffic and accompanying noise, and noise associated with routine park operations.

Utah prairie dogs in the Action Area and across the species' range are also susceptible to plague. Plague is caused by a bacterium (*Yersinia pestis*) not native to North America. Fleas are the most common vectors (Biggins and Kosoy 2001). Plague results in local extirpations, reduced colony sizes, increased variation in local population sizes, and increased distances between colonies (Cully and Williams 2001). Plague occurs within all three Utah prairie dog RUs, including the Paunsaugunt RU. The Park has been treating all of their colonies with insecticides (i.e., dusting) since 2008 to help control plague outbreaks.

### **4 EFFECTS OF THE PROPOSED ACTION**

For a detailed description of the effects of the proposed action see Section 9.1-9.2 in the January 2014 BA. Nineteen acres of Utah prairie dog habitat and an estimated 274 prairie dogs occur within a 350 foot buffer of the proposed development areas. The 350 foot buffer represents the distance in which prairie dogs can be disturbed by human activity (Ashdown 1996), and therefore we can expect that these development areas will result in some disturbance (e.g., alert responses, lowered feeding activity) to individual prairie dogs. Disturbance may occur due to the indirect effects of project noise levels, ground vibration, and increased human and vehicle activity. However, much of the Utah prairie dog habitat in the Action area occurs close to existing human activity, so there is likely a level of habituation that would lessen the effects of increased disturbances. There is the potential for construction activities to result in the accidental mortality or injury of individual Utah prairie dogs. About 5.2 acres of occupied prairie dog habitat fall within the actual footprint of the proposed development areas and will be lost permanently.

## **5 CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The entire action area is within the boundaries of Bryce Canyon National Park (under federal ownership) and subject to consultation pursuant to section 7 of the Act. Use of the Park will continue to increase over time, thus indirect and direct effects to Utah prairie dogs via recreation, motorized activities, human disturbance will continue into the foreseeable future.

## **6 CONCLUSION**

After reviewing the current Status of the Utah prairie dog, the Environmental Baseline for the Action Area, the Effects of the Proposed Action, and the Cumulative Effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Utah prairie dog. No critical habitat is designated for this species.

We have reached this conclusion based on the following reasons:

- The project could cause the permanent loss of up to 19 acres of Utah prairie dog habitat including 5.2 acres of occupied habitat. This equates to a relatively small amount (0.0012%) of mapped habitat within the Paunsaugunt RU. Furthermore, the majority of the impacted acreage will result in temporary and indirect impacts and will therefore allow for continued use by Utah prairie dogs.
- There are 19 acres of Utah prairie dog habitat that fall within a 350 foot buffer of the proposed development areas (see above), with only 5.2 acres of occupied prairie dog habitat falling within the actual footprint of the proposed development areas.
- The Project minimizes the potential for take of Utah prairies dogs and occupied habitat by incorporating conservation measures included in the Applicant Committed Conservation Measures of the NPS's BA and this BO.
- The Project will also help to offset the estimated impacts by committing to manage a minimum of 500 acres of Utah prairie dog habitat in the forthcoming Utah Prairie Dog Stewardship Plan (see supplemental letter to USFWS from NPS dated April 29, 2014- attached)

## **7 INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by us to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by us as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but

are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Project Proponent so that they become binding conditions of any grant or permit issued to the Project Proponent, as appropriate, for the exemption in Section 7(o)(2) to apply. We have a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Project Proponent (1) fails to assume and implement the terms and conditions or (2) fails to require any contractor to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to any grant document, the protective coverage of Section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Project Proponent or contractor must report the progress of the action and its impact on the species to us as specified in the Incidental Take Statement [50 CFR §402.14(i)(3)]

#### **AMOUNT OR EXTENT OF TAKE ANTICIPATED**

The proposed Project includes up to 19 acres of permanent impacts. Incidental take is expected to be in the form of harm (injury or mortality related to project activities, habitat degradation or loss, loss of forage) and harassment (resulting from disturbance of individuals during foraging or encouraging animals to move out of harm's way). We also believe that the level of harassment is likely to be small because many of these prairie dogs already exist with some level of human disturbance caused by traffic and noise from current human use in the Park.

As explained in Section 3.1, the adult Utah prairie dog adult spring count within the Action Area is 38 dogs and the adult population estimate is 76 Utah prairie dogs. The proposed Project will result in up to 19 acres of permanent impacts, although any Utah prairie dog within 350 feet of the proposed Project has the potential to be harassed by disturbance from increased human activities during the life of the project; and noise from construction and operational equipment. We have estimated that up to 274 (estimated summertime population) Utah prairie dogs may be harassed.

There is also the small potential for the Project to result in the mortality of individual Utah prairie dogs. We anticipate that no more than 14 prairie dogs will be incidentally killed. We believe this is an appropriate estimate because it accounts for approximately 5% of the estimated summertime Utah prairie dog population within 350 feet of the Action Area.

$$5\% \times 274 \text{ prairie dogs} = 14 \text{ prairie dogs estimated mortality}$$

If the take exceeds 274 prairie dogs (harassment) or 14 prairie dogs (mortality), all construction activities must be halted and the section 7 consultation reinitiated (refer to Section 10 of this BO).

## **EFFECTS OF TAKE**

In the accompanying biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the species. This biological opinion does not authorize any form of take that is not incidental to NPS's Project.

## **REASONABLE AND PRUDENT MEASURES**

1. Minimize effects to the listed species impacted by this project throughout the life of this project.

## **TERMS AND CONDITIONS**

To implement Reasonable and Prudent Measure #1:

- a) All applicant-committed conservation and minimization measures will be implemented as stated in the Project Description (see section 1.3) of this biological opinion.
- b) During the life of this plan (multimodal transportation plan), all applicable and/or additional conservation measures that are described in the forthcoming Bryce Canyon National Park Utah Prairie Dog Stewardship plan will be implemented.

## **8 REPORTING REQUIREMENTS**

Upon locating a dead or injured Utah prairie dog, initial notification must be made within one business day to our Division of Law Enforcement in St. George, Utah, at telephone (435) 673-3420, our Ecological Services Offices at telephone (801) 975-3330 and (435)-865-3763, and the Cedar City office of the Utah Division of Wildlife Resources at telephone (435) 865-6120. This reporting requirement will allow our Division of Law Enforcement or the UDWR to collect and process dead prairie dogs, if necessary, to determine cause of death. Instructions for proper handling and disposition of such specimens will be issued by the USFWS's Division of Law Enforcement consistent with the provisions of the Incidental Take Statement. Care must be taken in handling sick or injured animals to ensure effective treatment and care in handling dead specimens to preserve biological material in the best possible state.

## **8 CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that Bryce Canyon National Park continues to develop and finalize the Bryce Canyon National Park Utah prairie dog stewardship plan. A successful plan will fulfill the commitment from the Park to prioritize management of over 500 acres of Utah prairie dog habitat in perpetuity.

## **10 REINITIATION NOTICE – CLOSING STATEMENT**

This concludes formal consultation on the Bryce Canyon National Park Multimodal Transportation Plan. As provided in 50 CFR sec. 402.16, reinitiation of formal consultation is required for projects where discretionary Federal Agency involvement or control over the action has been retained (or is authorized by law) and under the following conditions:

1. The amount or extent of take specified in the Incidental Take Statement for this opinion is exceeded.
2. New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion.
3. The action is subsequently modified in a manner that causes an effect to listed species or critical habitat that were not considered in the biological opinion.
4. A new species is listed or critical habitat designated that may be affected by the action.

In instances where the amount or extent of incidental take is exceeded or if the terms and conditions of this biological opinion are not fully implemented, any operations causing such take must cease immediately pending re-initiation. To re-initiate section 7 consultation, NPS should immediately notify our office by phone or email if the anticipated incidental take is exceeded or if your agency needs to change the proposed action.

Thank you for your interest in conserving threatened and endangered species. If we can be of further assistance, please contact Nathan Brown at (435) 865-3763.

## **11 LITERATURE CITED**

- Ashdown, J. 1995. Visitor impact on avoidance responses in Utah prairie dogs (*Cynomys parvidens*) in Bryce Canyon National Park. Unpublished report, Weber State University, Ogden, Utah. 19pp
- Crocker-Bedford, D.C. 1976. Food Interactions between Utah Prairie Dogs and Cattle. M.S. Thesis, Utah State University, Logan.
- Biggins, D.E., and M.Y. Kosoy. 2001. Influences of Introduced Plague on North American Mammals: Implications from Ecology of Plague in Asia. *Journal of Mammalogy*, Vol. 82, No. 4:906-916
- Cully, J.F., and E.S. Williams. 2001. Interspecific Comparisons of Sylvatic Plague in Prairie Dogs. *Journal of Mammalogy* 82(4):894-905.
- U.S. Fish and Wildlife Service. 2012. Utah Prairie Dog (*Cynomys parvidens*) Revised Recovery Plan. U.S. Fish and Wildlife Service, Denver, CO. 169pp. March 2012.
- Utah Division of Wildlife Resources. 2014. Unpublished data from 1976 to 2013. Prairie dog count data. Transmitted to the Service February 2014.

## **APPENDIX A**

# **Utah Prairie Dog**

*(Cynomys parvidens)*

Status of the Species: May 2014

---

**U.S. Fish and Wildlife Service**

**Utah Field Office**



**2369 West Orton Circle, Suite 50**

**West Valley City, Utah 84119**

## **Table of Contents**

<b><u>Executive Summary</u></b> .....	14
<b><u>Literature Citations</u></b> .....	14
<b><u>Status of the Species / Critical Habitat</u></b> .....	15
<i>Species/Critical Habitat Description</i> .....	15
<i>Life History and Population Dynamics</i> .....	15
<i>Status and Distribution</i> .....	17
<i>Recovery Efforts</i> .....	23
<b><u>Literature Cited</u></b> .....	25

## **Executive Summary**

The purpose of this report is to summarize the status of the Utah prairie dog, a federally threatened species. For more information regarding the species, please contact the Utah Field Office by mail at 2369 West Orton Circle, Suite 50, West Valley City, Utah 84119, or by telephone at (801) 975-3330.

## **Literature Citations**

Literature Citations should read:

U.S. Fish and Wildlife Service. 2014. Utah Prairie Dog (*Cynomys parvidens*) Status of the Species: May 2014. U.S. Fish and Wildlife Service, West Valley City, Utah. 14 pp.

## **Status of the Species / Critical Habitat**

### *Species/Critical Habitat Description*

The Utah prairie dog (*Cynomys parvidens*) is the smallest species of prairie dog. Individuals are typically 12 to 14 inches (in) long (Hollister 1916) and weigh 1.4 to 3.1 pounds (Wright-Smith 1978). Utah prairie dogs range in color from cinnamon to clay. The Utah prairie dog is distinguished from other prairie dog species by a relatively short (1.2 to 2.8 in) white- or gray-tipped tail and a black “eyebrow” above each eye (Pizzimenti and Collier 1975; Hoogland 2003).

The Utah prairie dog was listed as an endangered species on June 4, 1973 (38 FR 14678), pursuant to the Endangered Species Conservation Act of 1969. At the time of listing, the species was threatened with extinction due to habitat destruction, modification or severe curtailment of habitat, over exploitation, disease, and predation. The species was reclassified as threatened on May 29, 1984 (49 FR 22330), with a special rule to allow take of prairie dogs on agricultural lands. The rule was amended in 1991 to increase the amount of regulated take and it was revised again in 2012. The revised 4(d) rule August 2, 2012, expanded the rule to include lethal take where prairie dogs “create serious human safety hazards or disturb the sanctity of significant human cultural or human burial sites”. The revised 4(d) rule August 2, 2012 expanded the rule to allow lethal “take on agricultural lands and properties within .5 mi of conservation lands”, and it set the annual take limit under the revised rule to 10 % of the annual range-wide population estimate instead of a “fixed” annual limit.

### *Life History and Population Dynamics*

Utah prairie dogs spend four to six months underground each year during harsh winter months (Hoogland 2001). Some observations suggest that Utah prairie dogs hibernate. However, other evidence suggests that at lower elevations Utah prairie dogs may enter torpor more intermittently at the beginning and end of the hibernation season and may be seen above ground in mild weather (Collier and Spillet 1975; Hoogland 1995, 2001; Lehmer and Biggins 2005). Torpor patterns of Utah prairie dogs might be influenced by environmental conditions, and may differ across the species’ range (Lehmer and Biggins 2005).

Adult males usually cease surface activity during August and September, followed by adult females several weeks later (lactating females enter hibernation later than non-lactating females) (Hoogland 2003). Juvenile prairie dogs remain active as late as November. Temperature is thought to trigger emergence from hibernation beginning in mid-March to mid-April. Mating occurs soon after emergence.

One half to two thirds of Utah prairie dog’s adult population is female (Mackley *et al.* 1988). Approximately 67 percent of females wean a litter each year (Hoogland 2001). Each female produces an average of 3.88 pups which are born in April after a 30 day gestation period

(Pizzimenti and Collier 1975; Wright-Smith 1978; Mackley *et al.* 1988; Hoogland 2001). Young appear above ground at five to seven weeks of age, are full grown by October of their first year, and reach sexual maturity at one year. Less than 50 percent of both males and females survive the first year (Hoogland 2001). Only about 20 percent of females and less than 10 percent of males survive to age 4 (Hoogland 2001). Due to their limited reproductive rates, short life span and high mortality rates, numbers of individuals counted within a colony can fluctuate greatly throughout the year with low points in the spring and peaks in the late summer when adults and pups are above ground.

Traditionally, it was thought that natal dispersal (movement of first year animals away from their area of birth) and breeding dispersal (emigration of sexually mature individuals from the area where they copulated) were male-biased, leading to higher mortality rates to young males from predation (Hoogland 2003). However, recent genetic work in a range wide study showed that of the Utah prairie dogs that dispersed, 25 percent were adult females (Brown 2009).

Young male Utah prairie dogs disperse in the late summer with average dispersal events of 0.35 mile (mi), long-distance dispersal events of up to 0.75 mi, and unusually long-distance dispersals of 4 mi (Mackley *et al.* 1988; Brown *et al.* 2011).

Utah prairie dogs are organized in social groups, or clans, consisting of an adult male, several females, and their young (Wright-Smith 1978). Clans are loosely organized with no observable dominance hierarchy. Geographic boundaries of clans remain fairly constant within a colony, and young prairie dogs are the only ones to regularly cross boundaries. Utah prairie dogs will use common feeding grounds, but still maintain elements of territoriality in those areas (Wright-Smith 1978). The typical home range of the Utah prairie dog is 750 feet (ft) (Crocker-Bedford 1975; Wright-Smith 1978) and the distance at which disturbance affects a prairie dog's normal behavior is estimated to be 350 ft (Ashdown 1995). Social behaviors, especially socially facilitated vigilance and warning vocalizations, are important to survival of individuals in colonies and to the overall well-being of the colony. The adult females play the major role in caring for young, they are also the primary ones that provide warning of danger (Wright-Smith 1978).

Utah prairie dogs forage primarily on grasses and forbs, and tend to select those with higher moisture content (Crocker-Bedford 1976). They often select colony sites in swales where the vegetation can remain moist even in drought conditions (Collier 1975; Crocker-Bedford and Spillet 1981). Vegetation must be of short stature to allow the prairie dogs to see approaching predators as well as have visual contact with other prairie dogs in the colony (Collier 1975; Crocker-Bedford and Spillet 1981). Prairie dogs will avoid areas where brushy species dominate, and will eventually decline or disappear in areas invaded by brush (Collier 1975; Player and Urness 1983). Well-drained soils are a habitat requirement for Utah

prairie dogs to excavate burrow sites. Burrows must be deep enough to protect the prairie dogs from predators and environmental and temperature extremes.

Predators of Utah prairie dogs include: badgers (*Taxidea taxus*), coyotes (*Canis latrans*), raptors, fox, and weasels. In an established prairie dog colony, predators do not have a significant impact; conversely, they have a huge impact on translocation sites where an established social system or burrow system is not present.

Utah prairie dog populations are susceptible to sylvatic plague (*Yersinia pestis*), a bacterium introduced to the North American continent in the late 1800's (Cully *et al.* 1993). There is a limited understanding of the variables that determine when sylvatic plague will impact prairie dog populations. Fleas are the vectors that spread the disease and can be brought into the vicinity of a prairie dog colony by a suite of mammals. Plague outbreaks generally occur when populations increase to high densities causing increased stress among individuals and easier transmission of disease between individuals.

#### *Status and Distribution*

There are five species of prairie dogs native to North America (Hoogland 2003). Taxonomically, prairie dogs (*Cynomys spp.*) are divided into two subgenera: the white-tail and black-tail. The Utah prairie dog (*C. parvidens*) is a member of the white-tail group, subgenus *Leucocrossuromys*. Other members of this group, which also occur in Utah, are the white-tailed prairie dog (*C. leucurus*) and the Gunnison prairie dog (*C. gunnisoni*).

The Utah prairie dog is recognized as a distinct species (Zeveloff 1988; Hoogland 1995), but is most closely related to the white-tailed prairie dog. These two species may have once belonged to a single interbreeding species (Pizzimenti 1975). They are now separated by ecological and physiographic barriers and exhibit genetic differences. The type locality for the Utah prairie dog is Buckskin Valley in Iron County, Utah (Pizzimenti and Collier 1975).

The Utah prairie dog is the westernmost member of the genus *Cynomys*. Historically, Utah prairie dog colonies were found as far west as Pine and Buckskin Valleys in Beaver and Iron Counties, and may have occurred as far north as Nephi, southeast to Bryce Canyon National Park, east to the foothills of the Aquarius Plateau, and south to the northern borders of Kane and Washington Counties (Figure 1) (Pizzimenti and Collier 1975). Factors that resulted in the historical decline of Utah prairie dogs were poisoning; drought; ecosystem conversion (agriculture, overgrazing, urbanization); shooting; and disease (Collier and Spillet 1972).

The Utah prairie dog currently occurs in three areas within southwestern Utah, which are designated as recovery units (RU; figure 2):

- 1) the Awapa Plateau;
- 2) the Paunsaugunt region, along the east fork and main stem of the Sevier River; and,
- 3) the West Desert region of Iron County, with a few isolated colonies existing in mountain and desert valleys in Iron and Beaver Counties (Pizzimenti and Collier 1975).

Utah prairie dogs are found in elevations from 5,400 ft on valley floors up to 9,500 ft in mountain habitats. For more information on these recovery units, refer to our revised recovery plan for the species (USFWS 2012).

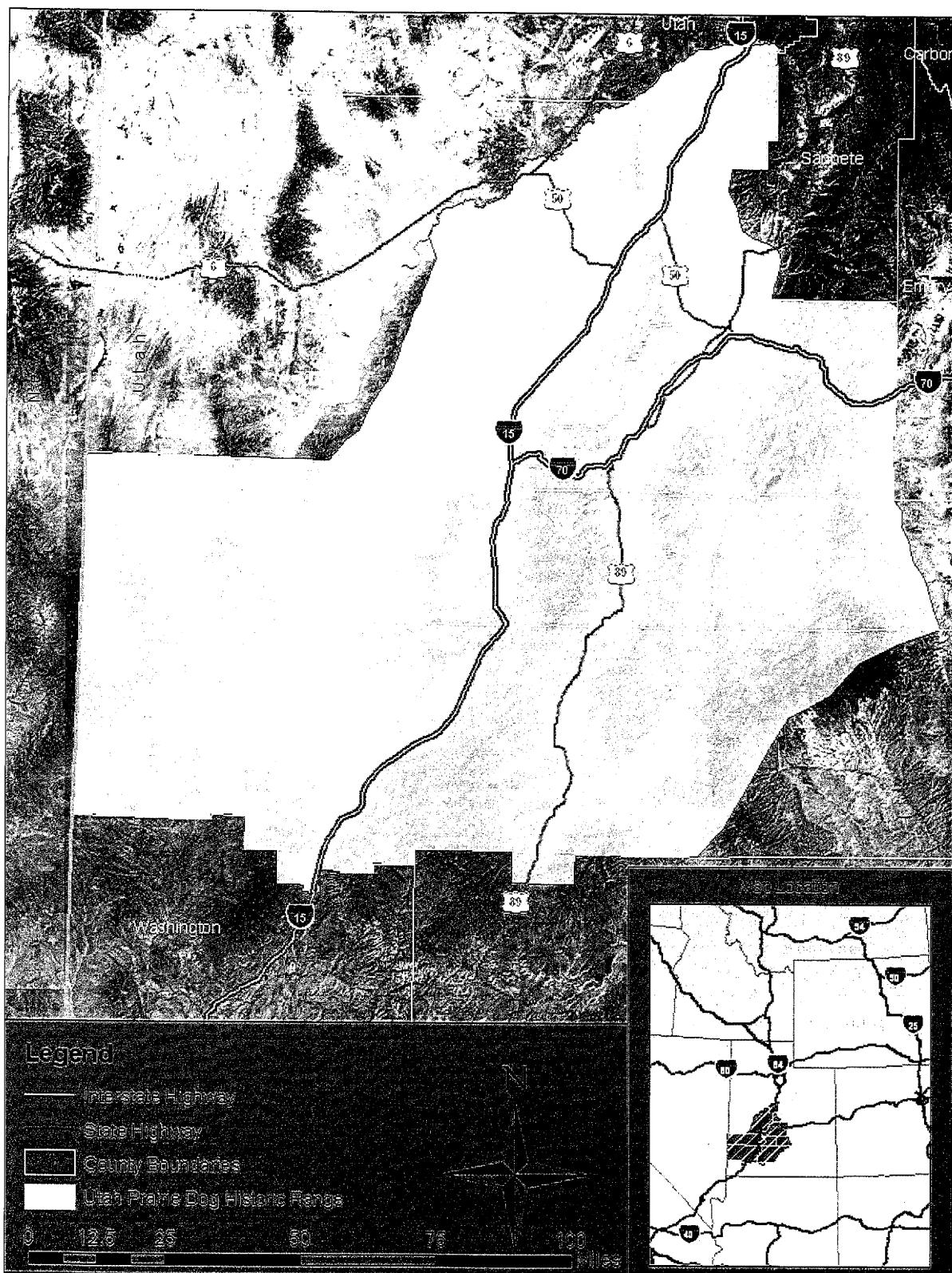


Figure 1. Utah prairie dog historic range.

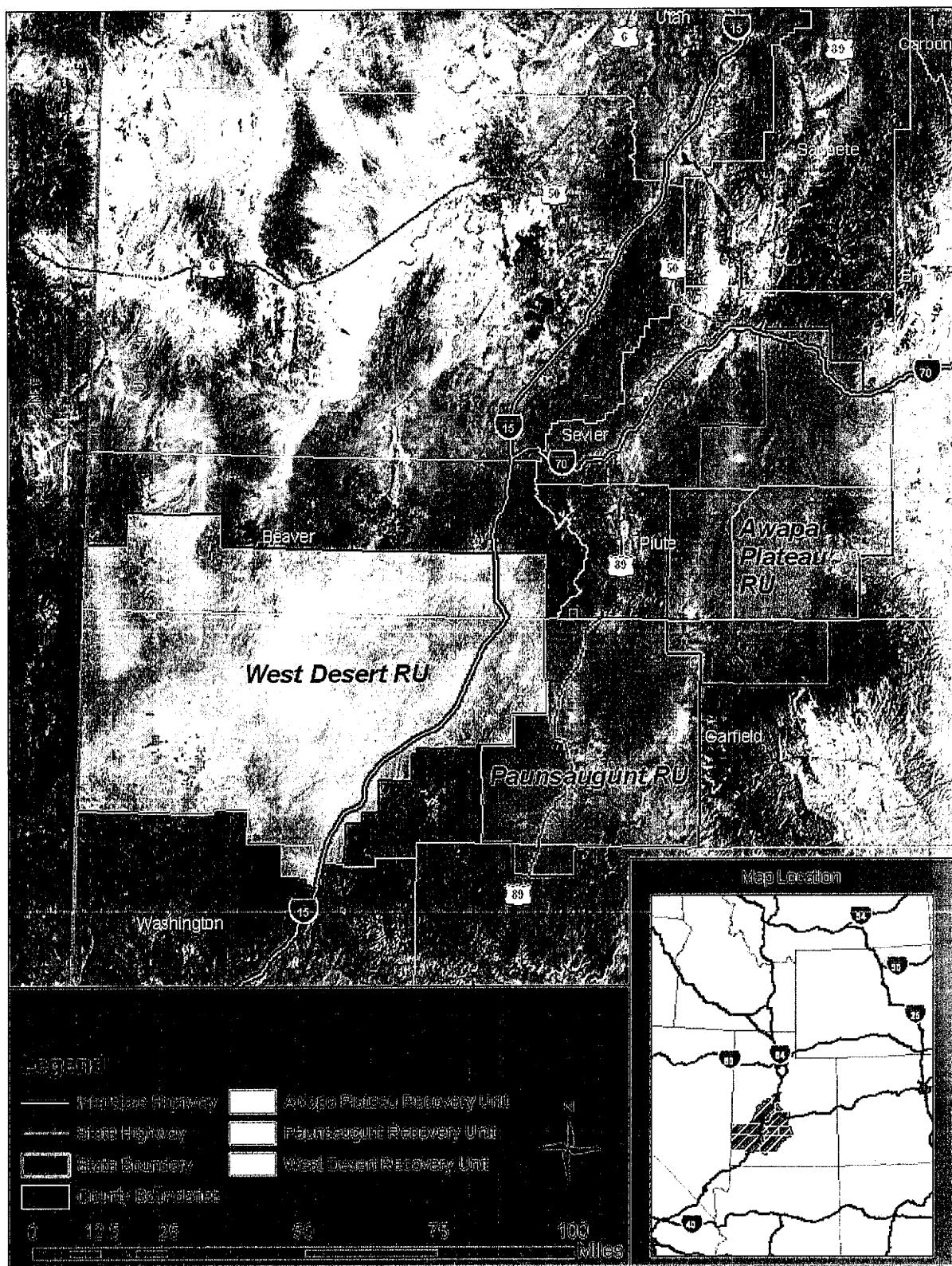
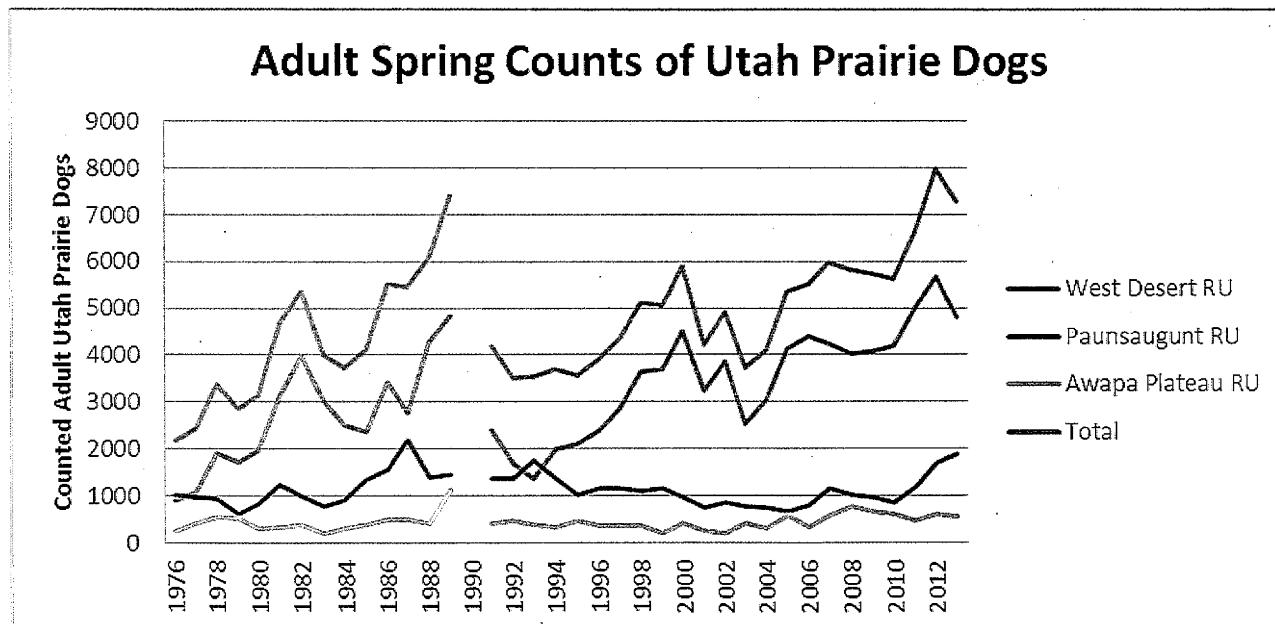


Figure 2. Utah prairie dog recovery unit boundaries.

Rangewide adult counts were as high as 7,979 in the 2012 spring census count (Utah Division of Wildlife Resources (UDWR 2010a) with a low count of 1,866 in 1976 (Figure 3). We use established survey protocols for counting Utah prairie dogs and determining population trends. Counts are made in the spring before juveniles emerge and we estimate that only 50 percent of all adults within the colony are seen at any one time (Crocker-Bedford 1975). Counts of adult Utah prairie dogs from 2009 to 2013 are 5,742; 5,631; 6,640; 7,979; and 7,269 respectively (Figure 3) (UDWR 2010a, UDWR 2012, UDWR 2014). Total population estimates are calculated using a formula that accounts for the adult population estimate derived from spring counts and the estimated reproduction:

$$\text{Population estimate} = [(2 \times \text{Spring Adult Count}) \times 0.67 \text{ (proportion of adult females)} \times 0.97 \text{ (proportion of breeding females)} \times 4 \text{ (average number of young per breeding female)}] + (2 \times \text{Spring Adult Count})$$

Overall, spring counts from the past 30 years show considerable annual fluctuations, but stable to increasing long-term trends in adult Utah prairie dog numbers.



**Figure 3. Graph of Adult Utah Prairie Dog Counts (1976-2013)<sup>1</sup>.**

<sup>1</sup> The 1990 count has been removed because none of the private lands colonies were counted due to staffing and budget limitations.

In 1972, the UDWR began mapping occupied Utah prairie dog habitat throughout their range (USFWS 2012). The UDWR has mapped 59,656 acres as Utah prairie dog habitat (UDWR 2010b). Mapped Utah prairie dog habitat includes any and all areas within the species' range that were mapped since 1972 as currently or historically occupied by Utah prairie dogs. Official maps of mapped Utah prairie dog habitat are maintained by the UDWR and Utah prairie dogated annually. Occupied habitats are areas of known Utah prairie dog habitat that, at the time in question, support Utah prairie dogs. There are 16,841 acres of mapped habitat in the West Desert Recovery Area; 15,620 acres of mapped habitat in the Paunsaugunt Recovery Area; and 27,195 acres of mapped habitat in the Awapa Recovery Area (Table 1) (UDWR 2010b).

**Table 1. Mapped Utah Prairie Dog Habitat by Land Ownership (acres).**

LAND OWNERSHIP <sup>2</sup>	RECOVERY UNITS		
	West Desert	Paunsaugunt	Awapa
<b>U.S. Forest Service</b>	140	3,776	8,591
<b>Bureau Land Management</b>	6,372	602	9,367
<b>National Park Service</b>	0	301	60
<b>Protected Habitat</b>	266	0	566
<b>Utah School and Institutional Trust Lands Administration Lands</b>	428	4,778	6,850
<b>Private</b>	9,969	6,163	1,761
<b>Total</b>	17,175	15,620	27,195
<b>Habitat Removed (Developed)</b>	400 (est)	0	0
<b>Total Habitat Remaining</b>	16,775	15,620	27,195

#### *Recovery Efforts*

The 2012 Utah Prairie Dog Revised Recovery Plan (USFWS 2012) calls for the three recovery units (RU) to each contain 2,000 adult animals for 5 consecutive years (based on annual spring counts), and to maintain these population goals by protecting populations from habitat loss (i.e., development) and managing the threat of plague. Our recovery strategy for the Utah prairie dog focuses on the need to address colony loss and disease through a program that encompasses threats abatement, population management, research, and monitoring. We emphasize: conserving existing colonies; establishing additional colonies on federal and protected non-federal lands via

---

2 The definitions used in these tables for public, protected, and State Institutional Trust Lands Administration lands are found in the glossary.

habitat improvement or translocations; controlling the transmission of plague; and monitoring habitat conditions. Recent successes include the protection of over 1,200 acres of nonfederal lands through habitat acquisitions and conservation easements with willing landowners; increased translocation successes on United States Forest Service (USFS) lands near Bryce Canyon National Park, due in part to increased plague management efforts; and the encouraging field trials and early success an oral plague vaccine.

A rangewide public-private partnership called the Utah Prairie Dog Recovery Implementation Program (UPDRIP) was initiated in 2010 (<http://suu.edu/ad/regional/updrip/about.html>). There is currently limited funding available to pursue landscape-level conservation efforts for recovery of the species. However, the Program has already become a valuable tool for increasing coordination efforts and is preparing action plans for Utah prairie dog conservation. In addition, the support of UPDRIP partners has already proven important in obtaining some funding from various grant programs.

All Recovery Team and Recovery Program members are involved in efforts to conserve and recover the Utah prairie dog using the best available information and adaptive management practices. We believe that the Utah prairie dog is a very recoverable species, particularly if we can successfully garner resources, cooperation, and dedication from all involved.

## Literature Cited

- Ashdown, J. 1995. Visitor impact on avoidance responses in Utah prairie dogs (*Cynomys parvidens*) in Bryce Canyon National Park. Unpublished report, Weber State University, Ogden, Utah. 19pp.
- Bonzo, T. and K. Day, 2003. Utah Prairie Dog Recovery Efforts 2002 Annual Report. Publication No. 03-47. Utah Division of Wildlife Resources. 26 pp.
- Brown, Nathanael L. 2009. Genetic Variation, Gene Flow, and Structure in a Highly Disturbed And Threatened Species, The Utah Prairie Dog. M.S. Thesis. Syracuse University. Syracuse, NY. 41pp.
- Brown, N.L., N.D. Perry, K.Day, and T.Griffin. 2011. Utah Prairie Dog Recovery Efforts, 2003-2008 Progress Report. Pulication no. 11-18 Utah Division of Wildlife Resources, Salt Lake City, UT. 51pp.
- Collier, G.D. 1975. The Utah Prairie Dog: Abundance, Distribution and Habitat Requirements. Publication No. 75-10. Salt Lake City, Utah. 94 pp.
- Collier, G.D. and J.J. Spillet. 1972. Status of the Utah Prairie Dog (*Cynomys parvidens*). Utah Academy of Sciences, Arts, and Letters 49:27-39.
- Crocker-Bedford, D.C. 1975. Utah Prairie Dog Habitat Evaluation. Proceedings of the Utah Wildlife Technical Meeting. 7 pp.
- Crocker-Bedford, D.C. 1976. Food Interactions between Utah Prairie Dogs and Cattle. M.S. Thesis, Utah State University, Logan.
- Crocker-Bedford, D.C. and J.J. Spillet. 1981. Habitat Relationships of the Utah Prairie Dog. Publication No. 1981-0-677-202/4. U.S. Department of Agriculture, Forest Service, Intermountain Region, Ogdern, Utah. 29 pp.
- Cully, J.F., Jr., A.M. Barnes, T.J. Quan, and G. Maupin. 1993. Dynamics of Plague in a Gunnison's Prairie Dog Colony Complex from New Mexico. Journal of Wildlife Diseases 33:706-719.
- Hollister, N. 1916. A Systematic Account of the Prairie Dogs. North American Fauna 40:1-37.
- Hoogland, J.L. 1995. The black-tailed prairie dog: Social life of a burrowing mammal. University of Chicago Press. Chicago, IL. 557 pp.

Hoogland, J.L. 2001. Black-tailed, Gunnison's, and Utah Prairie Dogs All Reproduce Slowly. *Journal of Mammalogy* 82:917-927.

Hoogland, J.L. 2003. Black-tailed Prairie Dog *In* Wild Mammals of North America, Biology, Management and Conservation. Second Edition. Edited by Feldhamer, G., B. Thompson, and J. Chapman.

Jacobs Engineering Group. 2010. Utah Public Airport Operations on the Utah Prairie Dog Biological Assessment. 46pp.

Lehmer, E.M, and D.E. Biggins. 2005. Variation in Torpor Patterns of Free-ranging Black-tailed and Utah Prairie Dogs Across Gradients of Elevation. *Journal of Mammalogy* 86:15-21.

Mackley, J.W., S.G. Whisenant, and J.T. Flinders. 1988. Dispersal and Life History of the Utah Prairie Dog (*Cynomys parvidens*) following Habitat Modifications. Unpublished Report, Department of Botany and Range Science, Brigham Young University, Provo, Utah. 24 pp.

McDonald, K.P. 1993. Analysis of the Utah Prairie Dog Recovery Program, 1972-1992. Publication No. 93-16. Utah Division of Wildlife Resources, Cedar City, Utah. 81 pp.

Pizzimenti, J.J. and G.D. Collier. 1975. *Cynomys parvidens*. *Mammal. Species* 56:1-2.

Player, R.L. and P.J. Urness. 1983. Habitat Manipulation for Reestablishment of Utah Prairie Dogs in Capitol Reef National Park. *Great Basin Naturalist* 42(4):517-523.

U.S. Fish and Wildlife Service. 1991. Utah Prairie Dog Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 41 pp.

U.S. Fish and Wildlife Service. 2012. Utah Prairie Dog (*Cynomys parvidens*) Revised Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 169 pp.

Utah Division of Wildlife Resources. 1998. Habitat Conservation Plan for Utah Prairie Dogs in Iron County, Utah. Utah Division of Wildlife Resources and Iron County Commission, Iron County, Utah. 72pp. June 26, 1998.

Utah Division of Wildlife Resources. 2010a. Unpublished data from 1976 to 2009. Prairie dog count data. Transmitted to the Service on March 22, 2010.

Utah Division of Wildlife Resources. 2010b. Unpublished data from 1976 to 2009. Prairie dog counts by landownership data. Transmitted to the Service on March 22, 2010.

Utah Division of Wildlife Resources. 2012. Unpublished data from 1976 to 2011. Prairie dog counts by landownership data. Transmitted to the Service on April 19, 2012.

Utah Division of Wildlife Resources. 2014. Unpublished data from 1976 to 2013. Prairie dog count data. Transmitted to the Service February 2014.

Wright-Smith, M.A. 1978. The Ecology and Social Organization of *Cynomys parvidens* (Utah prairie dog) in South Central Utah. M.A. Thesis, Indiana University, Bloomington. 44pp.

Zeveloff, S.I. 1988. Mammals of the Intermountain West. University of Utah Press, Salt Lake City, UT. pp. 147-148.