



United States Department of the Interior  
FISH AND WILDLIFE SERVICE

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

December 8, 2006

In Reply Refer To

FWS/R6

ES/UT

F-0048

6-UT-06-F-022

Memorandum

To: Mike Stempel, Assistant Regional Director for Fisheries and Endangered Species,  
Region 6, Lakewood, Colorado

From: Larry Crist, Field Supervisor, Utah Fish and Wildlife Office, West Valley City,  
Utah

Subject: Intra-Service Consultation on the Issuance of a 10(a)(1)(B) Permit for the Cedar  
City Golf Course and Paiute tribal lands Habitat Conservation Plan

This biological opinion was prepared at the request of the Ecological Services Regional Office of the U.S. Fish and Wildlife Service (Service) as required by the Endangered Species Act of 1973, as amended, for proposed issuance of a section 10(a)(1)(B) incidental take permit for the Utah prairie dog (*Cynomys parvidens*) associated with the Cedar City Golf Course and the Paiute Tribal Lands Habitat Conservation Plan (HCP).

The threatened bald eagle (*Haliaeetus leucocephalus*) is the only other Federally-listed species that may occur in the project area. The Service has determined that the proposed action may affect, but is not likely to adversely affect, the bald eagle. Although bald eagles are known to winter in Iron County, given the proximity of the development of Cedar City, it is unlikely that they are foraging on the golf course or on tribal lands. Utah prairie dogs are not known to be a primary prey item for bald eagles. No further analysis of impacts to this species is included in this biological opinion.

The Utah prairie dog is federally listed as a threatened species and occurs in six counties in southwestern Utah. This biological opinion addresses impacts of the proposal to this species and was prepared using information contained in the HCP application package prepared by Cedar City Corporation and the Paiute Tribe. Additional information was obtained from existing Service files and communications among Service employees and representatives from the Division of Wildlife Resources (UDWR) and the Cedar City District of the Bureau of Land Management (BLM).

## **Consultation History**

Discussions between the Service and Cedar City (applicant) regarding Utah prairie dogs on the Cedar City Golf Course were initiated in late 2000. On July 8, 2003 Cedar City submitted the first draft of the HCP and the Service replied with comments on August 7, 2003. A revised HCP draft was submitted to the Service on October 13, 2003 and the Service replied on November 5, 2003. In January, 2004, the applicant decided to include the Paiute tribal lands into the coverage area of the HCP. Following this decision, the Service and the applicants conducted several meetings and correspondence via email to discuss and clarify details of the HCP. On May 15, 2006, the Service published a Notice of Availability for the Cedar City Golf Course and Paiute Tribal Land HCP in the Federal Register.

## **BIOLOGICAL OPINION**

### **Description of Proposed Action**

The Service proposes to issue 10(a)(1)(B) permits to Cedar City Corporation and to the Paiute Indian Tribe (Applicants) to incidentally take Utah prairie dogs during the course of normal management activities of a golf course and high use recreational areas. A thorough description of the action can be found in the HCP itself (Section 2, pages 7 and 8) and is incorporated herein by reference (Guymon, 2006). The HCP includes several avoidance and minimization measures as well as mitigation that also are considered to be part of the proposed action. The avoidance and minimization measures are contained in section 5 of the HCP and the mitigation measures are contained in section 6 of the HCP and are incorporated herein by reference.

The Applicants propose to manage the Cedar City Golf Course and the Paiute Tribal lands to be free of Utah prairie dogs. Their proposed management would involve live trapping and translocation of the animals from these areas to translocation sites approved by the Utah prairie dog Recovery Team. Translocation would be carried out for two consecutive years (during translocation season as defined in the Translocation Recommendation document). The applicants propose to mitigate this impact by protecting 303 acres of occupied and potential Utah prairie dog habitat in perpetuity under a conservation easement held by the Utah Division of Wildlife Resources (UDWR). The Applicants, in conjunction with the Bureau of Land Management (BLM) and the UDWR have restored habitat on 198 acres of the 303 acres in efforts to increase Utah prairie dogs. Once restoration actions have met specific criteria identified in the HCP, translocation of Utah prairie dogs will commence to approved translocation sites within the West Desert Recovery Area. All translocation efforts will occur under the guidance of UDWR as per the Translocation Recommendations approved by the Utah prairie dog Recovery Team.

The proposed mitigation is a 303 acre parcel of land surrounded by BLM lands. The parcel is currently occupied by a small colony of Utah prairie dogs. The parcel has the potential to support a much larger colony with habitat restoration. The parcel is within three miles of one of the largest colonies within the west desert and will provide connectivity with and between several colonies on adjacent BLM lands.

The action area for the proposed action includes the Cedar City Golf Course and the Paiute Tribal lands as well as Wild Pea Hollow. The golf course and the Tribal lands have been

developed for recreation purposes and are heavily utilized. Wild Pea Hollow is shrub step consisting of rolling hills that historically were covered with basin big sagebrush (*Artemisia tridentata ssp. tridentata*) with a scattering of Utah juniper (*Juniperus osteosperma*). It is surrounded by BLM lands with access via a 2-track on the west side of the parcel. In recent years, due to several range fires (both wild and controlled burns), much of the area has burned allowing native grasses and shrubs to become the dominant species.

## **Status of the Species**

The Utah prairie dog is the westernmost member of the genus *Cynomys*. The species' range, which is limited to the southwestern quarter of Utah, is the most restricted of all four prairie dog species in the United States. As ascertained by Collier (1975), the species distribution was much broader prior to control programs and in the past, extended across the desert almost to the Nevada-Utah state line. At one time, the species was known to occur in approximately 700 sections in 10 areas of southwestern Utah. The total species population was estimated to be 95,000 animals prior to control programs in the 1920's (Turner 1979).

By the 1960's, distribution of the Utah prairie dogs was greatly reduced due to a non-native disease (sylvatic plague), poisoning, drought, and human-related habitat alteration resulting from cultivation and poor grazing practices. Today, plague and loss of habitat from human-related activities continues to threaten the species as once small rural communities grow and expand into the agricultural areas. Studies by Collier and Spillett (1972) indicated that the Utah prairie dog had declined or been eliminated from major portions of its estimated historical range. By 1972, they estimated that there were 3,300 Utah prairie dogs in 37 separate colonies.

Pursuant to authority contained in the Endangered Species Conservation Act of 1969 80 Stat, 926 (16USC 668aa-668cc), as amended by 83 Stat, 275(16 U.S.C. 668cc-14 to 668cc-6), on June 4, 1974, the Secretary of Interior amended title 50, Part 17 Appendix D "U.S. List of Endangered Native Fish and Wildlife", to include the Utah prairie dog. 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. In 1984, a final rule was published which downlisted the species to threatened and issued a 4d rule to allow regulated take of the species. At that time the primary threat to the species was still considered to be loss of habitat to human residential and agricultural development.

Because of the improved status of the species and the population increases on private lands in the Cedar and Parowan Valleys, where Utah prairie dog numbers climbed from a count of 627 in 1976 to 3,699 animals in 1982, the UDWR petitioned the Service to remove the Utah prairie dog from the U.S. List of Endangered and Threatened Wildlife and develop a special rule under section 4(d) of the Endangered Species Act to allow "take" of 5,000 animals annually between June 1 and December 31 on agricultural lands in Cedar and Parowan Valleys in Iron County. Upon reviewing all pertinent biological data, the Service determined that the Utah prairie dog was not currently in danger of extinction and published the Final Rule reclassifying the species to threatened and establishing the special rule on May 29, 1984 (49 FR 22330). In June of 1991, the special rule was revised to include all agriculture land throughout the range of the species and to increase the take from 5000 to 6000 animals annually (USFWS 1991b).

Utah prairie dogs occur in principal concentrations in three areas: the Awapa Recovery area, the Paunsaugunt Recovery Area, and the West Desert Recovery Area. Each spring, before the young of the year have emerged, the UDWR surveys all known colonies to estimate the number of adults. These numbers do not represent a true census but indicate trends in population numbers. The decreasing trend in Utah prairie dog counts prior to 1972 appeared to have stabilized by the mid 1970s (Heggen and Hasenyager 1977); population numbers vacillated greatly over the next twenty years (McDonald 1993). Total counts have been as high as 7,400 in the 1989 spring census count (Coffeen 1989) with a low count had of 3,500 animals in 1992, largely due to climatic and disease factors (McDonald 1993). Annual monitoring most likely underestimated the total number of adult animals because only 40 to 60 percent of individual prairie dogs are above ground at any one time (Crocker-Bedford 1975). Recent population numbers continue to exhibit fluctuating trends. Rangewide spring survey counts conducted by the UDWR in the spring of 2005 reported 5381 adult Utah prairie dogs (Day 2006).

The primary objective of the Utah prairie dog Recovery Plan is to reestablish Utah prairie dog populations on public lands (U.S. Fish and Wildlife Service 1991) and ensure the continued existence of the species. To date, approximately thirteen new colonies have been established on public lands within the West Desert. In 1972, the UDWR initiated a transplant program to move animals from private agricultural lands to areas of historical occupancy on public lands. Over a 31-year period from 1972 to 2002, over 19,561 Utah prairie dogs were translocated to public land sites (Bonzo 2003). Although initial survival has been low, the number of Utah prairie dog colonies on public lands has increased. Increases in the known number of active colonies on public land can be attributed to a combination of factors including the translocation program, natural increases and distribution from existing sites, and discovery of previously unrecorded colonies. Despite the aforementioned public land efforts at establishing new Utah prairie dog colonies and supplementing existing ones, approximately 67% of Utah prairie dogs still occur on private and other non-federal lands (Day 2006).

In 1994, the Recovery Implementation Team (RIT) was formed, due in large part to the cooperative efforts of federal and state agencies. In 1997, the RIT developed an Interim Conservation Strategy to direct recovery activities including habitat improvement and translocation efforts, as well as direct research activities to further improve conservation and recovery measures. Federal agencies involved in management of the Utah prairie dogs have worked to recover and conserve the Utah prairie dog and its' habitat using the best available information and adaptive management practices.

### **Life History**

The Utah prairie dog is one of three species of prairie dogs that live in Utah, all of which are in the subgenera *Leucocrossuromys* or white-tailed prairie dogs. Utah prairie dogs range in color from cinnamon to clay, with dark markings above the eyes and white on the tip of the tail (Pizzimenti,1975). Adult Utah prairie dogs measure from 12 to 14 inches in length.

One half to two thirds of the adult population of the Utah prairie dog is female (Mackley et al. 1988); the skewed sex ratio is attributed to higher mortality rate in young males (USFWS 1991a). Generally, females give birth to one litter per year, with an average of four young which are born in April after a gestation period of 30 days (Pizzimenti and Collier 1975, Wright-Smith 1978, Mackley et al. 1988). However, Mackley et al. (1988) report that 3% of adult females do

not bring a litter above ground each year. 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.

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 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). Soils need to be well drained for burrow sites. Burrows must be deep enough to protect the prairie dogs from predators as well as environmental and temperature extremes. Utah prairie dogs are found in elevations from 5,400 feet on valley floors up to 9,500 feet in mountain habitats.

Predators on Utah prairie dogs include: badgers, coyotes, raptors, fox, and weasels. In an established prairie dog colony, predators do not make 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 highly susceptible to sylvatic plague (*Yersinia pestis*), a bacterium introduced to the North American continent in the late 1800's (Cully 1993). We have 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.

## **Environmental Baseline**

The environmental baseline is defined as the past and present effects of all Federal, State, or private actions and other human activities in the action area, the anticipated effects of all proposed Federal actions in the action area that have already undergone formal or early section 7 consultation, and the effects of State or private actions that are contemporaneous with the consultation in progress.

### Status of the Utah prairie dog Within the Action Area

The proposed action falls in the West Desert Recovery Area which supports approximately 75% of the prairie dog population (Day 2006). The West Desert Recovery Area encompasses essentially all of Iron County and a small portion of Beaver County. As of 2006, Iron County has approximately 8241 acres of occupied prairie dog habitat (Day 2006). After a prolonged drought, the West Desert population had a low count of 2,523 animals in 2003, just after a record high in 2000 of 4,521. The population estimates of 2005 show a strong increase (4,158) approaching the high of 2000.

On the golf course and Tribal lands, occupied habitat and prairie dog numbers fluctuate greatly. Due to the artificial conditions (unlimited food supply and lack of predators) on the golf course, prairie dog numbers can get quite high. These high numbers are vulnerable to plague outbreaks which result in colony crashes which could account for dramatic fluctuations. There is no native habitat on the golf course or the Tribal lands and no significant connectivity between these areas

and the remainder of the optimum habitat within the Recovery Area. Therefore the role of these animals to long term recovery of the species is minimal.

The land to be protected under the proposed action, Wild Pea Hollow, supports a small colony of Utah prairie dogs. Recent counts indicate that the colony is expanding. The colony is surrounded by BLM lands and adjacent to occupied habitat on BLM lands. Although the habitat is not completely native, it is more natural and through restoration will provide a better habitat than the golf course and Tribal lands.

#### Factors Affecting Species within the Action Area

Since 1995 seven permits have been issued under section 10(a)(1)(B) of ESA within the West Desert Recovery Area, the largest being the Iron County HCP. All of these permits have authorized take of up to 8,374 animals (with a concomitant loss of 9,608.65 acres of habitat) through 2018. Since 1990, twenty formal consultations under section 7 of ESA have been initiated resulting in the loss of approximately 183 acres of habitat and 298 animals.

In 1984, the Service issued a 4(d) rule for Utah prairie dogs which was amended in 1991. The current rule authorizes control of up to 6,000 animals annually on private agricultural lands between July 1 and December 31 throughout their range. Authorized take of Utah prairie dogs under the 4(d) is overseen and permitted by the UDWR and is based on spring counts and annual production of the colony. A 10 year review of Certificates of Registration from 1997 through 2004 for agricultural land owners indicated that an average of 976 animals was taken annually range wide. Although future take under the 4(d) can not be quantified, it is reasonable to assume that some amount would be authorized as needed to control animals causing damage on agricultural lands.

Wild Pea Hollow currently supports a small colony of Utah prairie dogs which is predicted to increase with restoration actions. It is surrounded by BLM land that supports additional Utah prairie dog colonies and will provide good dispersal habitat as well as the opportunity for genetic mixing between colonies.

#### **Effects of the Action**

The full description of the effects of the action is described in Section 4 of the HCP. A total of approximately 18 acres of occupied habitat, 13.5 acres on the golf course (phase I) and 4.5 acres on the tribal land (phase II), will be permanently lost. This constitutes less than 0.2% of occupied habitat within the West Desert Recovery Area. The West Desert Recovery Area, within which the project lies, contains over 12,000 acres of mapped habitat (habitat that has been occupied and mapped some time since 1973). The area within 0.3 mile of the covered lands is developed or is mountainous and not suitable for prairie dogs. The colonies located on the Cedar City Golf Course and the Paiute tribal lands are fragmented and becoming more isolated as development continues within Cedar City. The viability of this colony is questionable due to this isolation and the unnatural conditions existing on these lands. Utah prairie dogs could be directly affected if they enter the project area from adjacent lands but most of the colonies within 0.25 mile of the covered lands have been developed under the Iron County HCP, or are so fragmented that they are in danger of extinction (Day 2006). As they are developed under the Iron County HCP, they will no longer provide a source of dogs to the colonies at the golf course and tribal lands.

An estimated 604 Utah prairie dogs will be translocated within the first two years. Translocation of prairie dogs from this site to approved translocation sites supports the current Utah prairie dog Recovery Plan. However, survival of translocated Utah prairie dogs is low, less than 10%. Survival is based on retention of animals to the translocation site the following year. Some animals within the 90% considered lost may in fact have survived but dispersed to a site that is not monitored.

The proposed mitigation associated with the issuance of the permit consists of the protection in perpetuity of 303 acres of Utah prairie dog habitat in the West Desert. Of the 303 acres, 19 are occupied and 187 have been restored through burning and reseeded. All of the acres restored could be occupied and will provide foraging and dispersal habitat for the Wild Pea colony. This habitat is surrounded by BLM lands and adjacent to BLM lands supporting another colony. The location of Wild Pea Hollow will provide opportunities for genetic mixing between the two colonies as well as potential genetic mixing with the nearby Minersville 3 colony which is a large persistent colony on BLM lands approximately 3 miles away. Protection of this land will minimize fragmentation in the future of the West Desert Recovery Area and provide good habitat for expansion and dispersal of adjacent colonies.

### **Cumulative Effects**

Cumulative effects include the effects of future State, tribal 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 ESA.

### **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 the Service's opinion that the action as proposed is not likely to jeopardize the continued existence of the Utah prairie dog, and is not likely to destroy or adversely modify designated critical habitat as no critical habitat has been designated. The Service has reached this opinion based on the following reasons:

1. The proposed action will affect .2 % of occupied habitat within the West Desert Recovery Area.
2. The golf course and tribal land prairie dog colonies are considered isolated and not essential for the recovery of the species.
3. The identified goal of the HCP to protect 303 acres of habitat in perpetuity will offset the loss of habitat at the golf course and the tribal lands.
4. The identified goal to enhance 198 acres of that 303 acres will contribute to recovery of the species by improving habitat to meet vegetation guidelines proposed by the Utah prairie dog recovery team.
5. The identified goal to contribute to the establishment of Utah prairie dog colonies on public land through the translocation of animals from the golf course and tribal lands contributes to recovery goals identified in the 1991 Recovery Plan.

## **INCIDENTAL TAKE**

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

### **Amount or Extent of Take Anticipated**

Due to the fluctuating nature of Utah prairie dog numbers, it is difficult to quantify the amount of take anticipated under the proposed action. However, based on five year average annual counts, it is anticipated that 604 animals could be taken as a result of this proposed action in the form of live trapping. The proposed action included lethal control of Utah prairie dogs after two consecutive years of translocation. However, lethal control of Utah prairie dogs is not considered incidental to otherwise legal activities and will not be authorized. The Service and the Applicants have agreed to remove lethal trapping from the permit. Live trapping and translocation of Utah prairie dogs will be authorized for the life of the permits to allow all lands covered by the HCP to be managed free of Utah prairie dogs. Utah prairie dogs would also be harmed by the permanent loss of 18 acres of habitat.

### **Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of Utah prairie dogs.

The Service shall ensure that the permittees under the Cedar City Golf Course and Paiute Tribal Land HCP comply with the measures contained in the HCP, including the implementation of all the avoidance, minimization, and mitigation measures.

### **Terms and Conditions**

To be exempt from the prohibitions of section 9 of the ESA, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The Service must condition the section 10(a)(1)(B) incidental take permit to include all measures proposed in the HCP.
2. The Service must require the applicants to coordinate with the Utah Division of Wildlife Resources in all Utah prairie dog trapping efforts to ensure that approved translocation recommendations are followed and any impacts to Utah prairie dogs are minimized.
3. The Service must annually monitor compliance with the HCP through the review of annual reports submitted.
4. The Service, at the Permittees request, must provide technical assistance on the implementation of the HCP and the conservation of Utah prairie dogs.
5. The Service, as a last resort, must revoke the permit if changed or unforeseen circumstances occur that mean the continuation of permitted activities would likely result in jeopardy to covered species (50 CFR 17.22/32(d)(7)). The Service will revoke because of jeopardy concerns only after first implementing all practicable measures to remedy the situation.
6. In the event that a Utah prairie dog (dead, injured, or hibernating) is located during the life of the permit, the Utah Field Office of the Service (801) 975-3330 or the Service's Law Enforcement Office (435) 865-0861 will be contacted immediately.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Service must immediately provide an explanation of the causes of the taking and review the need for possible modification of the reasonable and prudent measures.

### **REPORTING REQUIREMENTS**

Upon locating a dead or injured Utah prairie dog, initial notification must be made within one business day to the Service's Division of Law Enforcement in Cedar City, Utah at telephone (435) 865-0861, the Service's Ecological Services Office at telephone (801) 975-3330, and the Cedar City office of the Utah Division of Wildlife Resources at telephone (435) 865-6120.

Instructions for proper handling and disposition of such specimens will be issued by the Service'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. Dead specimens should be handled carefully to preserve biological material in the best possible state.

### **RE-INITIATION STATEMENT**

This concludes formal consultation on the proposed Cedar City Golf Course and Paiute Tribal Lands HCP and associated permit in Iron County, Utah. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, or 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, any operations causing such take must cease pending re-initiation.

Thank you for your interest in conserving threatened and endangered species. If you have any questions please contact Elise Boeke at 801-975-3330 ext. 123.

cc: Keith Day, Utah Division of Wildlife Resources, Southern Regional Office, 1470 North Airport Road, Cedar City, UT 84720

Bonnie Bell, U.S. Fish and Wildlife Service, Law Enforcement, Cedar City, UT

Becky Bonebrake, Bureau of Land Management, Cedar City Office,

bcc: Project file  
Reading file

EAB/jm:12/7/06  
z:/Boeke/BO/Golfcourse/HCP BO Fin.doc

## LITERATURE CITED

- Bonzo, T., and K. Day, 2003. Utah prairie dog Recovery Efforts 2002 Annual Report. Utah Division of Wildlife Resources. Publication No. 03-47. 26 pp.
- Day, Keith,. 2006. 2005 Utah prairie dog survey results. Utah Division of Wildlife Resources. Unpublished data.
- Day, Keith, 2006. "Mapped Utah prairie dog acres in the West Desert". E-mail to Elise Boeke, September 14, 2006.
- Day, Keith, 2006. "Utah prairie dogs within the Action Area of the Cedar City Golf Course and Tribal HCP". E-mail to Elise Boeke, September 14, 2006.
- Day, Keith, 2006. "2005 4d permits". Utah Division of Wildlife Resources. Unpublished data. E-mail to Elise Boeke, August 9, 2006.
- Coffeen, M. P. 1989. Daft annual Utah prairie dog progress report to U.S. Fish and Wildlife Service by the Utah Division of Wildlife Resources. Unpubli. Rep. Project SE-1, Job U-06. Salt Lake City, Utah. 7 oo.
- Collier, G.D., and J.J. Spillett. 1972. Status of the Utah prairie dog (*Cynomys parvidens*). Utah Acad. Sci., Arts, Lett. 49:27-39.
- \_\_\_\_\_. 1975. The Utah prairie dog: abundance, distribution and habitat requirements. Pub. No. 75-10. Salt Lake City, Utah. 94 pp.
- Crocker-Bedford, D. 1975. Utah prairie dog habitat evaluation. Proc. Utah Wildl. Tech. Mtg. 7 pp.
- Crock-Bedford, D.C. and J.J. Spillett. 1981. Habitat relationships of the Utah prairie dog. Publication No. 1981-0-677-202/4. U.S. Dept. of Agric., Forest Service, Intermountain Region, Ogden, Utah. 29pp.
- Crocker-Bedford D. 1976. Food interactions between Utah prairie dogs and cattle. M. S. Thesis, Utah State University, Logan.
- 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.
- Guymon, J., 2006. Habitat Conservation Plan For the Cedar City Golf Course and the Paiute Tribal Lands.
- Heggen, A.W., and R.H. Hasenyager. 1977. Annual Utah prairie dog progress report to U.S. Fish and Wildlife Service by the Utah Division of Wildlife Resources. Unpubl. Rep. Salt Lake City, Utah. 4 pp.

- 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. Unpubl. Report, Dept. of Botany and Range Sci, Brigham Young Univ., Provo, Utah. 24pp.
- 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.
- Turner, B. 1979. An evaluation of the Utah prairie dog (*Cynomys parvidens*). Unpubl. Rep. Prepared for the Utah Division of Wildlife Resources. 53 pp.
- U.S. Fish and Wildlife Service. 1973. Endangered and Threatened Wildlife and Plants; Final Rule to List the Utah prairie dog. 38 Federal Register 14678 (June 4, 1973).
- \_\_\_\_\_. 1991. Utah prairie dog recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado. 41 pp.
- \_\_\_\_\_. 1984. Endangered and Threatened Wildlife and Plants; Final Rule to Reclassify the Utah prairie dog as Threatened, With Special Rule To Allow Regulated Taking. 49 Federal Register 22330 (May 29, 1984).
- Utah prairie dog Recovery Implementation Team. 1997. Utah prairie dog Interim Conservation Strategy. Members of team in collaboration with Dr. Mark Ritchie, Utah State University.
- Wright-Smith, M.A. 1978. The ecology and social organization of *Cynomys parvidens* (Utah prairie dog) in south central Utah. MA. Thesis, Indiana University, Bloomington. 44pp.