



Cherry Creek State Park



Prairie Dog Management Plan January 2015

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INTRODUCTION

Black-tailed prairie dogs (*Cynomys ludovicianus*) are a mammal species native to the eastern plains of Colorado. They are considered a keystone species in maintaining healthy and diverse shortgrass prairie ecosystems. Prairie dogs excavate extensive systems of burrows that are collectively called colonies or towns. They graze vegetation to a relatively low stature and cover, preferentially grazing on grasses relative to forbs. Prairie dog colonies sustain many other wildlife species that use their burrows for shelter, prey on them, or use the resultant mosaic of vegetation structure (different heights of vegetation) and vegetation cover. Species often found in close association with prairie dogs include burrowing owls, ferruginous hawks, bald eagles, several suites of prairie birds, plains rattlesnakes, swift foxes, coyotes, badgers, and various amphibians and reptiles. Historically, bison once targeted prairie dog towns for wallowing activities. In addition to providing habitat for many other species, their behavior has beneficial effects on soils; it decreases soil compaction, increases water absorption, and promotes soil aeration.

Black-tailed prairie dogs have a high level of social structure. Within the colonies, prairie dogs live in small groups, called coterie, which are generally composed of one or more adult males, variable numbers of adult females and juvenile offspring. Individuals within a coterie exhibit territorial behavior with adjacent groups in the colony. Prairie dogs have one litter of three to eight young per year, usually in March or April. Year-old juveniles and sometimes adults leave or disperse from the colony in late spring, and may colonize new areas as far as six miles away.

Dynamics of prairie dog colonies formerly occurred across large swaths of the landscape, with colonies expanding and contracting based on resource availability. Landscape fragmentation from roads, urbanization, and/or agricultural development has confined colonies into more limited and distant patches. This habitat fragmentation limits emigration of juveniles and can increase densities within colonies, which can have a consequent increase in local pressure on vegetation resources. When colonies lose the ability to function on a landscape-scale, they have a modified role. Isolated colonies in fragmented landscapes are less able to support quantities of associated species. Localized, severe disturbance creates vulnerabilities to noxious weed establishment and soil erosion from water or wind, which can create air and water quality concerns.

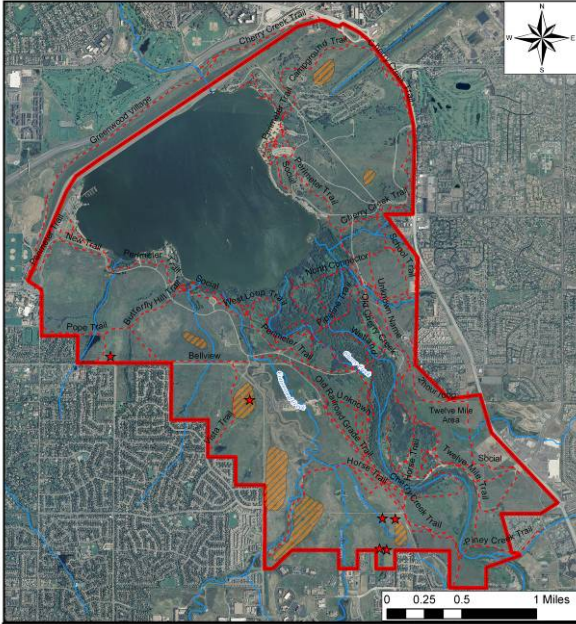
Further, like other rodents, prairie dogs can carry plague, a disease caused by bacterium transmitted by fleas. The bacterium can be fatal to humans if not treated. There have been several colonies affected by plague and there have been human deaths in Colorado from plague carried by prairie dogs transmitted via family pets. Plague in prairie dog colonies is monitored by the Colorado Department of Public Health and the Environment. Other concerns with regard to prairie dog colonies on Colorado State Parks include that some associated species, such as rattlesnakes preying upon the prairie dogs and other associated residents, are not desirable neighbors for humans in adjacent campgrounds.

Historical estimates suggest approximately twenty percent of the short- and mid-grass prairie across eleven states may have been occupied by black-tailed prairie dogs. However, their range has been greatly reduced in the past century by encroaching development and agricultural practices. Because of this decline and because other endangered species like the black-footed ferret rely solely on black-tailed prairie dogs for their survival, they are a species of conservation concern.

The conservation status of black-tailed prairie dog is complex. This species was identified as a Candidate Species under the Endangered Species Act (ESA) in 1999 and was removed from this designation in 2004. The U.S. Fish and Wildlife Service has recently (December 2, 2009) released its 12 month findings and determined that the black-tailed prairie dog is not warranted for listing under the Endangered Species Act and is no longer a candidate to be listed as a threatened or endangered species. However, black-tailed prairie dogs are also classified as pest species by the Colorado Department of Agriculture and may be controlled in response to damage to crops, real or personal property, or livestock. Black-tailed prairie dogs are currently the focus of a multi-state conservation effort to manage the species cooperatively in an effort to preclude listing under ESA. The Colorado Division of Wildlife currently lists the Black-tailed prairie dog as a state species of special concern.

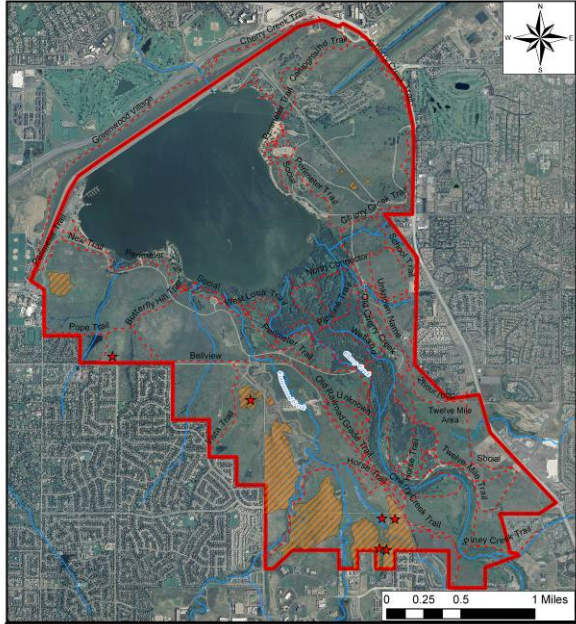
POPULATION OF PRAIRIE DOGS AT CHERRY CREEK

Prairie dogs are among the most commonly seen wildlife at Cherry Creek State Park. There are currently many active colonies located throughout the park. The colonies expansion is limited only by natural barriers such as riparian vegetation or our park borders. Below are maps showing historic prairie dog activity and current colonies in 2015.



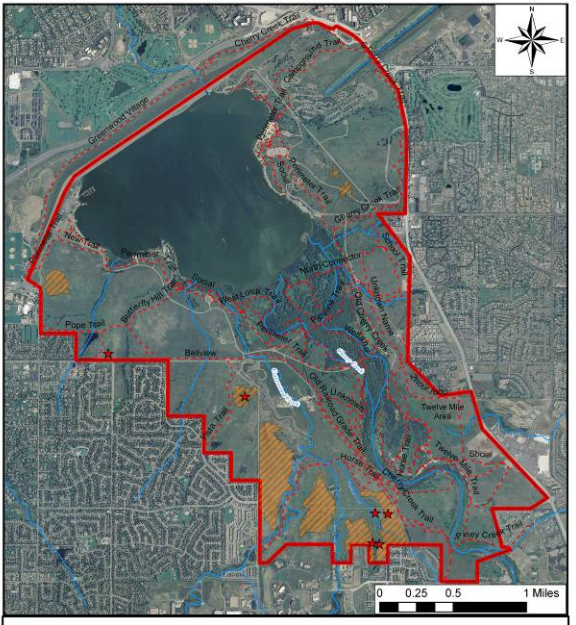
Map Legend

- Park Boundary
- Prairie Dog Range 1999
- Trails
- Streams
- ★ Burrowing Owls (approx. locations)



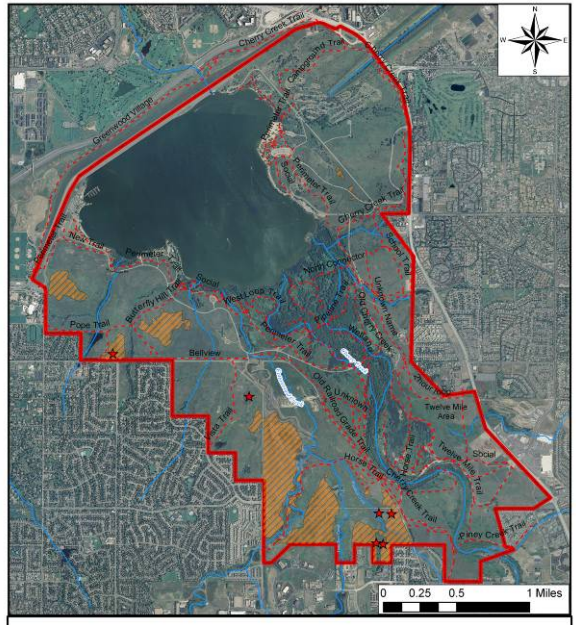
Map Legend

- Park Boundary
- Prairie Dog Range 2003
- Trails
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- ★ Burrowing Owls (approx. locations)



Map Legend

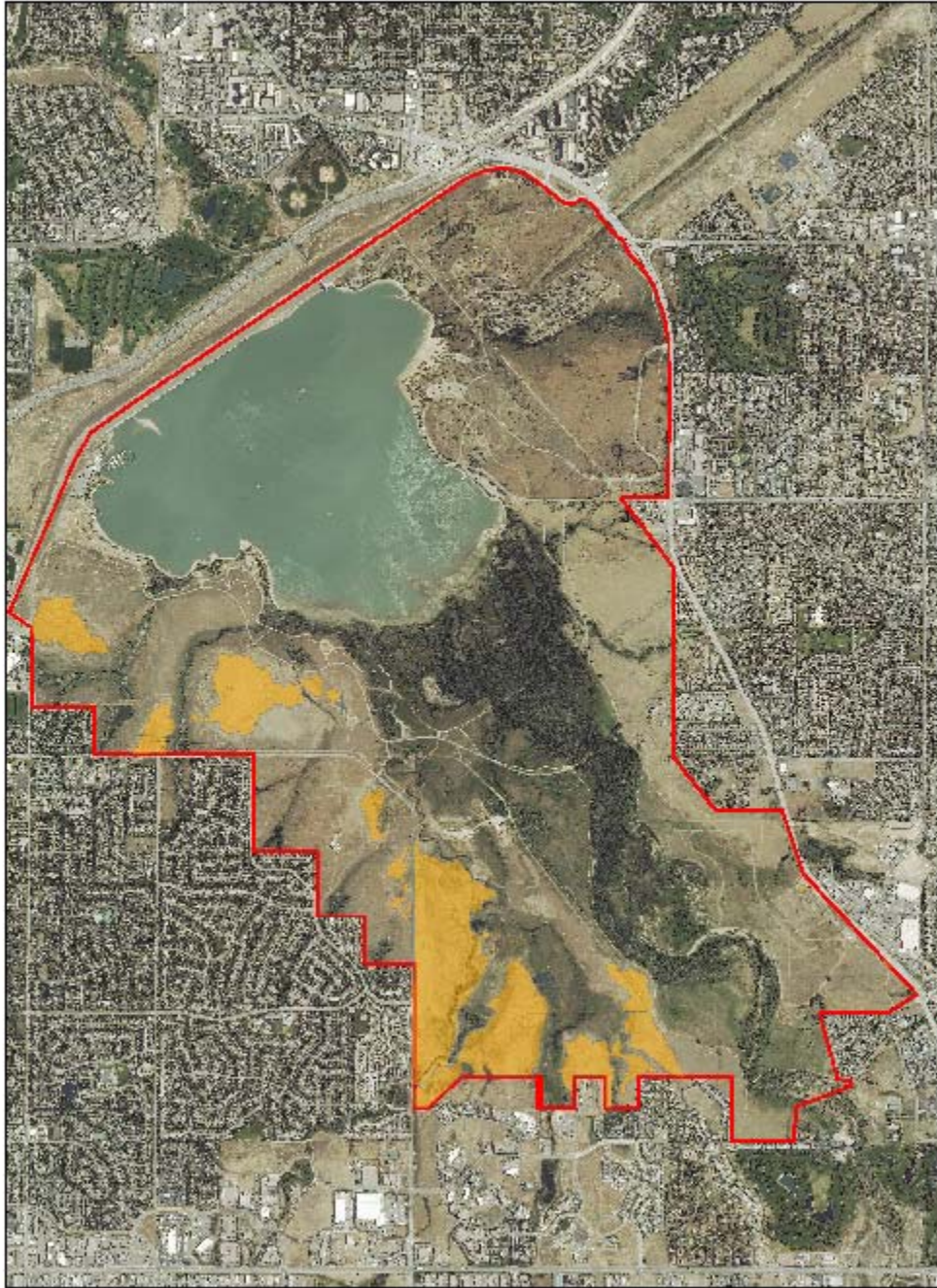
- Park Boundary
- Prairie Dog Range 2005
- Trails
- Streams
- ★ Burrowing Owls (approx. locations)



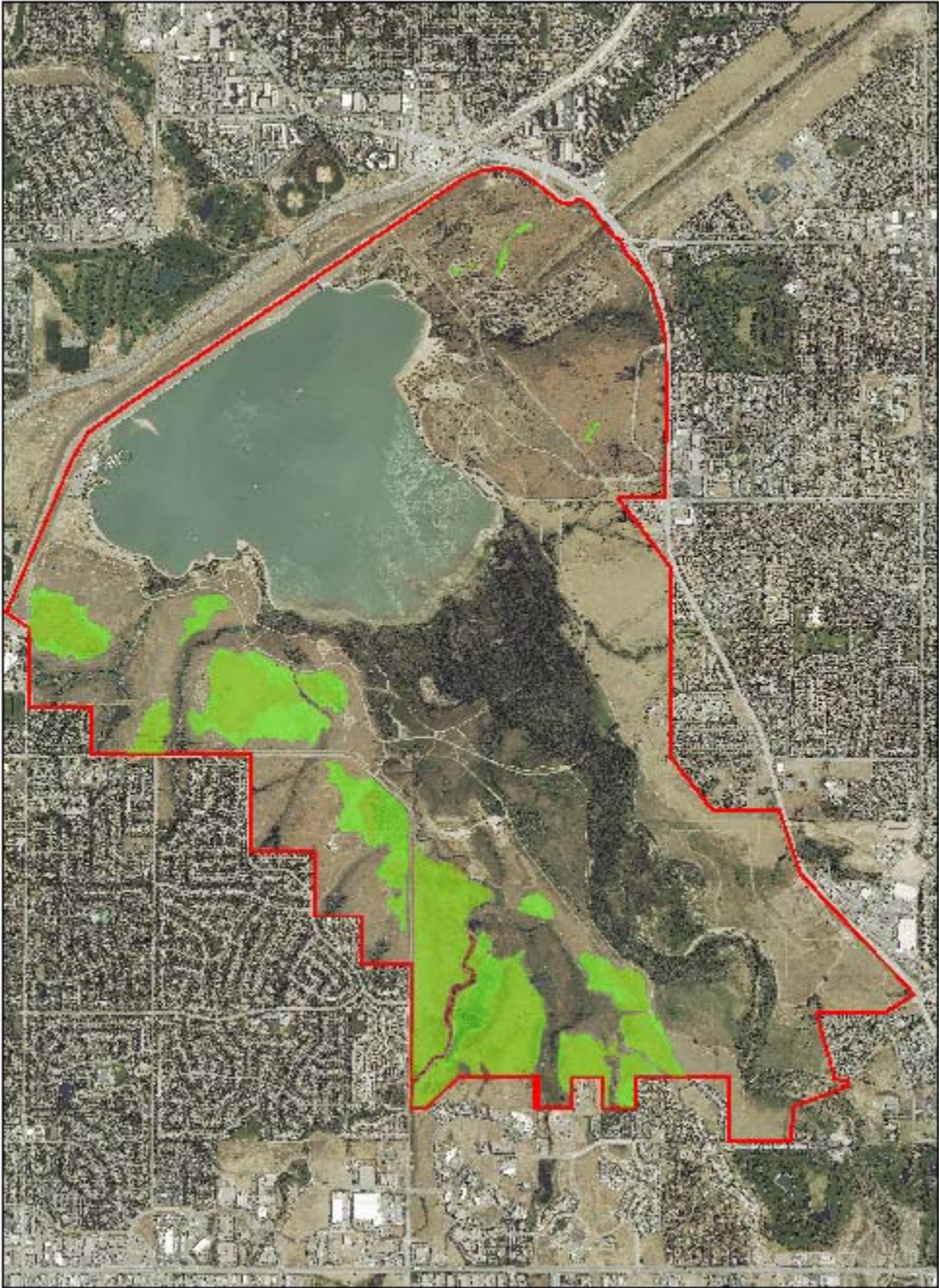
Map Legend

- Park Boundary
- Prairie Dog Range 2009
- Trails
- Streams
- ★ Burrowing Owls (approx. locations)

2011 Active Prairie Dog Colonies



Current 2015 Active Prairie Dog Colonies



CONCERNS

The various concerns and overall purpose of this plan is to keep a healthy balance between the prairie dog colonies and a growing multi-dimensional user public. As previously, stated prairie dogs can carry plague, a disease caused by bacterium transmitted by fleas. The bacterium can be fatal to humans if not treated. This is a major concern for the park since the colony is now expanding into the parks campgrounds. This greatly increases the chance of plague being transmitted to humans. With the amount of people who bring their dogs to our state parks there is a chance that if there were an outbreak of plague that an infected flea could contaminate a guest's pet which in turn could also infect the pet's owner. This is one concise reasoning behind designating an exclusion and buffer zone. These proposed areas will give adequate space between campers and the prairie dog colony in the unfortunate event of a plague outbreak within the colony. In the short term, the goal would be to keep the prairie dog active colony at least 150 yards from the campgrounds and in the end at least 250 yards.

A second concern is that prairie dogs at very high densities can degrade the quality of the habitat. When this happens, the area becomes very susceptible to invasion by noxious weeds. The number of natural predators at Cherry Creek State Park appears to be too low to naturally keep prairie dog populations at sustainable levels and the populations is increasing at unnatural levels which is causing them to eat too quickly for the grass to sustain itself. Noxious weeds can spread in these higher density areas and then move into the campground areas. Keeping a distance between the active colonies and the developed areas will allow for better control and suppression of weed species.

There are several environmental concerns that are associated with prairie dog control. Most cost effective control options have negative impacts associated with them. There is always the chance of unintentionally harming non-target species which use prairie dog burrows for habitat and food. These impacts can be mitigated to reduce negative effects, but there is always a real concern when using lethal controls. There are several species such as burrowing owls, swift fox, rabbits, raptors, and several reptiles that use prairie dog burrows for food and cover which could be negatively affected by the use of controls. To reduce these impacts we have included recommended times to perform controls measures to reduce the chance of harming non-target species. Also proper wildlife monitoring prior to performing lethal controls should and will always be implemented to mitigate harming non-target species. The Colorado Parks and Wildlife's "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls When Conducting Prairie Dog Control" should be used prior to any lethal control methods.

Forage reduction, geographic location, rainfall and noxious weed progression are effects on the limited acreage of CCSP, careful consideration and management survey assist in determining the need for limited control effort.

GOALS

While recognizing the obvious importance of the role prairie dogs play within the short grass prairie ecosystem, there is a legitimate need to control their numbers when they present **health and safety** issues or **degrade their habitat**. These goals balance the need to conserve a reasonable population of the black-tailed prairie dogs at Cherry Creek State Park, while recognizing that control is necessary and

appropriate in areas where prairie dogs present human health hazards or encroach upon neighboring landowners.

Management **plan objectives** are as follows:

A. **Maintain prairie dog** colonies to minimize human health hazards.

Park staff will closely monitor prairie dog colonies for evidence of plague. Observations of suspected plague activity will be reported to the Colorado Department of Health and Environment.

B. **Minimize degradation** of natural resources

Prairie dog populations, associated species, and vegetation resources will be monitored where staff and funding resources are available. As resources permit, the size, extent, and trends of colonies will be mapped and evaluated; the presence/absence of associated species will be monitored; and vegetation condition in and adjacent to prairie dog colonies will be monitored. Prairie dog colonies are at risk for noxious weed invasion; Park staff will inventory, monitor, and treat affected areas to remove noxious weeds in and around colonies.

C. **Minimize environmental** impacts of control methods

Use control or treatment methods that are cost efficient and safe but that minimize environmental impacts. The main concern is to avoid impacts to burrowing owls by avoiding treatment during burrowing owl breeding season (March 15 to November 1).

STRATEGY

To achieve these goals, the park can be divided into three zones (these zones are still be discussed by park staff) to tailor management to the appropriate area as follows:

Habitat Conservation Area – In this zone the goal would be to retain a healthy population of prairie dogs that can provide habitat for many other species as well as providing food to raptors and turning over the soil. Barriers would not be created on all sides as gene flow would be desirable.

Buffer zone – In these zones prairie dogs would be controlled or treated as necessary, likely once every 1-2 years (avoiding burrowing owl breeding season by trying to treat during November 1 to March 14). This area will help to keep the colony at a safe distance away from campgrounds.

Exclusion zone – In these areas prairie dogs will not be allowed. Group Camp Sites, Swim Beach, Various Group picnic areas, Horse Stables, the Dog Off Leash Area and other high use recreation areas. Any prairie dogs in this zone will be treated often and burrows may be destroyed. The timeframe for this should occur during November 1 to March 14. However, in the campground and other recreation areas of the exclusion zone we would like to give park staff a bit more time to perform their control efforts.

So in the campground and other recreation areas of the exclusion zone control efforts can be performed during March 15 to October 31 only after the area has been monitored and shows NO sign of burrowing owls. These are active prairie dog colonies and due to the proximity of campers and other park users it is unlikely that burrowing owls would be nesting in this part of the colony.

1. SHORT TERM STRATEGY

The short term strategy must be to treat and remove prairie dogs from the campgrounds, though they are likely to reinvade this will likely be what can be accomplished this year. The colony located at the west gate is another priority due to its close location to several schools and a large amount of foot traffic. Also treating any new or relatively small colonies before they have expanded into exclusion areas is a priority for high public use sites.

2. LONG TERM STRATEGY

For the long term strategy, the goal is to keep prairie dogs at a safe distance from the campgrounds at all times. This will limit the chance of disease transmission to humans in the event of a plague outbreak in the prairie dog colony. The park must also work closely with our neighbors to keep the prairie dog populations within our borders.

3. PREVENTION STRATEGY

There are a number of techniques that can encourage the natural predation of prairie dogs and reduce the amount of eradication. Artificial raptor perches, tree plantings for future raptor perches, and other plantings can provide additional cover for predators.

- Raptor Perches - It may be worth considering some raptor perches such those shown in the map, and working with partners on raptors may help if raptor activities are watched and recorded in this area prior to placing the perches. Perches could be placed near the campgrounds or closer to the roads that would eventually define the exclusion area. Black Hills Energy has provided poles free of charge in the past, and this option should be considered to reduce Parks cost.
- Natural Barriers - Shrub plantings, berms, and the use of straw bales have also been used to provide visual barriers and cover for predators. These methods can reduce the need for lethal control, but may not completely prevent the movement of prairie dogs across property boundaries. Planting or transplanting of native drought tolerant shrubs such as yucca (*Yucca glauca*), rabbitbrush (*Chrysanthemum nauseosus* or *viscidiflorus*), skunkbrush (*Rhus aromatica* ssp *trilobata*) and cane cholla (*Cylindropuntia imbricata*) along roads at the edge of the campgrounds may provide some slowing of reinvansion by the prairie dogs. Park staff should consider opportunities to salvage these shrubs from other areas under construction and transplant them. Watering for only one year might be sufficient given the xeric nature of these species.

- Artificial Barriers - Artificial barriers could also be used, but may present aesthetic concerns. These techniques may be useful to reduce the movement of prairie dogs to adjacent landowners. Visual barriers constructed from burlap or solid vinyl barrier fence have showed moderate success in slowing colony expansion if the colony has been reduced significantly in the area prior to their placement. If barriers are placed in a location with active burrows or a large network of burrows, then they may not be effective.

4. TREATMENT AND CONTROL STRATEGY-considered by CCSP

Prairie dogs in the buffer or exclusion zones will be subject to both lethal and non-lethal controls. The primary purpose of this action is to minimize the movement of prairie dogs into areas where there would be conflict with recreation due to concerns of plague transmission.

Release of Prairie Dogs into an established colony likely will increase stress on resident and relocated Prairie Dogs.

Lethal controls will comply with the State of Colorado's pesticide application regulations, be authorized by the U.S. Fish and Wildlife Service, and coordinated with the local District Wildlife Manager of the Colorado Parks and Wildlife. Burrowing owls have historically nested in several locations inside the park. Thus, any controls should occur between November 1 and March 14 to comply with Guidelines from the Colorado Parks and Wildlife.

When handling any of the chemical controls, staff should be very cautious in using the best practices for personal protection equipment as these chemicals can pose safety concerns if not handled properly. See product MSDS sheets for more detailed information.

Fumigation

Fumigation is the method used most widely across Colorado and by government agencies for lethal prairie dog treatment. The Colorado Parks and Wildlife allows the use of EPA-approved toxins, including poisons, to control prairie dogs. Most regulations dealing with toxins for prairie dogs fall under the US Department of Agriculture or the Colorado Department of Agriculture. Both agencies classify the prairie dog as an "agricultural pest".

Aluminum phosphide tablets (Fumitoxin®, Gastoxin®, Phostoxin® and other brands) are dropped down into the burrows and the holes are stuffed with newspaper. The holes are then covered with dirt to prevent the gas from escaping. The tablets react with moisture in the burrow to produce hydrogen phosphide gas, which is toxic to all forms of animal life. To be effective, the tablets provide the best control when soil moisture is high and soil temperatures are above 60 degrees Fahrenheit. Aluminum phosphide is a restricted-use pesticide that can only be applied by certified applicators.

Gas cartridges are another alternative and are classified for general use and emit a suffocating gas (carbon monoxide). Montana department of agriculture states that they contain several combustible materials, primarily sodium nitrate, sulfur and charcoal. Toxic gasses, including nitrogen oxide, sulfur dioxide and carbon monoxide, are produced and oxygen is consumed as the cartridge burns. A fuse is lit

and the cartridge is placed inside the burrow opening, which is immediately sealed with sod or moist dirt.

When using fumigants, staff should treat only active burrows. Fumigants should NOT be used in burrows occupied by burrowing owls, rabbits, badgers, and other nontarget wildlife. Fumigation should not be used between March 15 and November 1 to avoid possible impact to burrowing owl breeding unless the site is monitored and no burrowing owl activity is recorded. The Colorado Parks and Wildlife's "Recommended survey protocol and actions to protect nesting and burrowing owls when conducting prairie dog control" should be followed prior to any treatments. Also after fumigation above ground carcasses should be bagged and removed quickly to avoid predation by raptors or carnivores that could be affected by the toxins. This will help minimize impacts to non-target species. Personal protection equipment should be worn when removing carcasses (long sleeves, long pants and gloves). One concern with fumigation is that burrows can be re-occupied after a fairly short time period.

Fumigation of Prairie dogs will most likely be performed by contract with licensed applicators. Contracts should include a next day follow up to remove any above ground carcasses to reduce impacts to non-target species, and also to treat any burrows that might have been missed or dug out during the initial treatment.

Pressurized Exhaust Rodent Control (PERC)

Pure exhaust (2.5% carbon monoxide, CO) is captured off a gas engine that drives a compressor, cooled, pressurized, and injected into the burrow of a burrowing rodent. The air in the burrow is purged very rapidly. The rodent is engulfed almost immediately in a high concentration of CO gas and overcome before it has a chance to escape or block the burrow.

A T-bar hand piece with a ball valve is on the end of each 3/8" air hose. Closed burrows are probed. When the tip of the probe breaks into the burrow, it literally falls into the burrow and is very easy to detect or feel. To treat open burrow rodents the probe or the 3/8" short air hose (furnished with the machine and replaces the 1/4" probe on the end of the T bar hand piece) is inserted into the open burrow. Dirt is then shovelled to close the opening and direct the gas flow down into the burrow.

Treated Bait

Treated baits are another alternative, but generally cost more than fumigation and take more time. A common brand of chemical for treated bait is Rozol® with the active ingredient chlorophacinone. This is another approved option for use to control prairie dogs in Colorado. This product comes in pellet form and is inserted a minimum of six inches into active prairie dog burrows. The treatment should take place during the absence of green vegetation or prior to a rain or snow storm to promote feeding. Two days of follow up are necessary to gather any carcasses that might have come to the surface prior to dying. Follow up should occur 5-10 days and 14-21 days after initial treatment to gather and bury any carcasses to prevent non-target species from scavenging. This is a restricted-use pesticide that can only be applied by certified applicators.

Zinc phosphide (Prozap®) used with oats is also an option to control prairie dogs in Colorado rangelands. This form of treatment requires prebaiting with one teaspoon of untreated oats per mound to increase acceptance of treated bait one or two days before pesticide is applied. Observation is necessary to determine which mounds should be treated with pesticide. Only mounds where the bait has been consumed should be followed up with treated oats. After all or most of the prebait has been consumed, oats and one teaspoon of bait should be applied by hand to the edge of mounds that successfully consumed prebait. This is a restricted-use pesticide that can only be applied by certified applicators.

Rodex 4000

This device consists of a wand that injects a mixture of propane gas and oxygen into a burrow opening. The operator controls a switch that delivers a spark in the end of the wand igniting the gas, and producing an explosive effect. The Rodex 4000 is a general-use device, which may be rented from other pest control districts. One advantage to this method is it collapses burrows, so it takes longer for prairie dogs to reestablish burrows in this area. Another advantage is that this method has less effects on non-target species than fumigants. The only effects on non-target species would be through direct impacts to other species in the burrows that are collapsed, but if only burrows with active prairie dogs are treated, then these impacts should be negligible. Any burrows with evidence that they are occupied by burrowing owls, rabbits, badgers, or other nontarget wildlife should not be treated. This method has some safety and public perception concerns and would certainly have to be approved by the Bureau of Reclamation in advance. Also there are concerns about using this method in proximity to utilities or infrastructure, as well as concerns about fire.

Kaput-D, should not be considered at CCSP as a control methodology. Carcass and non-target animals could be affected.

As always the label is the law. Always read and follow all directions listed on labels before starting any control treatment with pesticides. The applicator is responsible for knowing all laws pertaining to any pesticide they plan to use. The safety precautions and required personal protection equipment may be different for each chemical. Refer to the MSDS sheets attached and always review the latest sheets and labels with the chemicals.

Other Controls

There are other approved methods for physical control of prairie dogs; all current methodologies are essential to incorporation into the decision process.

5. MONITORING AND EVALUATION STRATEGY

When contractors or staff conducts chemical treatment, then a count of active burrows before and after treatment in the area is a good effective measure, and should be recorded and compared with existing data.

- Map Extents of Active Colonies Every 1-2 Years: The contractor or park should conduct an inventory of prairie dog colonies every 1-2 years to map the extents of the colonies. The areas should be walked with a GPS or drawn on an updated aerial photograph, such that the extents of the **active** burrows are correctly identified. This should be recorded electronically in GIS to track the history of the population.
- Conduct Density Counts in Treatment Areas Before and After: In the areas where prairie dogs will be treated, the contractor or staff should conduct density estimates before and after the treatment using the protocol below.
- Search for Rare Non-Target Species every spring: Raptor volunteers or staff should search every spring for burrowing owls and mountain plovers around the fringes of the prairie dog colonies and note any nests carefully and report those nests to the park staff and stewardship program. See the Colorado Parks and Wildlife's 2007 "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls When Conducting Prairie Dog Control" for details.
- General monitoring of new areas and for plague: As staff is going about their business in the park they should note any new areas where prairie dogs are encroaching or any sudden death of prairie dogs that might indicate plague. See more information about these below.

Density Count Protocol for Before/After Treatment

Density monitoring should be conducted pre and post treatment in order to evaluate treatment success. The goal is to count the total number of prairie dogs seen in the whole treatment area.

Weather: Monitoring should occur on days with moderate weather. Weather conditions can affect counts. Although Powell et al. (1994) stated that weather effects on prairie dog activities were minimal, strong winds can restrict aboveground activity. Menkens and Anderson (1993) and Severson and Plumb (1998) suggest counting during moderate weather, since prairie dogs are not active above ground during rainfall events, high winds and/or cold temperatures. Based on their suggestions, counts should be made when wind speeds are < 32 kph (20 mph), and temperatures are >10 °C (50 °F). Counts should also not be made when it is raining. Monitoring should occur during mid morning or late afternoon to avoid the hottest part of the day. When temperatures rise above 27°C (80°F) or so, individuals frequently submerge into their burrows, presumably to cool off (Bakko, Porter, and Wunder 1988).

Monitoring Points: Figuring out how many monitoring points and/or how many people are needed to conduct the monitoring will require a little planning. You need to draw out on the map the area to be treated and plan the minimum number of points needed to get an accurate count. Ideally, you would have multiple people monitoring at the same time from these locations and you would be sure they know where to draw the 'lines' between them. One or two people can conduct this monitoring by moving between the points, but then it becomes even more critical to know where the 'lines' are between the monitoring points. Monitors should pick viewing locations that allow them to view the entire colony (high ground, standing in bed of a truck, etc.). All monitors should use binoculars, should be outside the active colony area and spaced out well between each other. Visual markers on the

ground can be used to ‘draw lines’ between the observation areas in order to avoid counting the same prairie dogs multiple times. Monitoring positions should be located far enough away from the colony so that prairie dogs will not be disturbed and hiding in their burrows; they should be going about normal activities during counts. Monitors should get into position and wait approximately 10 minutes before beginning counts in order for the prairie dogs to resume normal activity. Once in position monitors should count all prairie dogs seen in their area. Monitors should complete at least 8 counts during a 10 minute period, and record each count onto data sheet for that monitoring point. The maximum number of prairie dogs seen during any of the 8 counts is the most accurate number of prairie dogs within that area.

Monitoring Point #	Date/Time	Record 8 readings within 10 mins	Max # of the counts
#2	2/10/10, 10:30 am	Example: 15, 17, 8, 6, 12, 14, 17, 15	17

After observations have been conducted at all the monitoring points, then the overall number used for the density should be the sum of the highest numbers at all of the points. So for instance if you have 5 monitoring points and you counted 20 at each point, then your total would 100 prairie dogs within the entire treatment area. Ideally monitoring should occur twice before treatment and twice after treatment. If that’s not possible then counting at least once is very important. This data should be recorded and kept to compare with future monitoring efforts to determine patterns or cycles in the population. It could be recorded in GIS tables of monitoring points established within the treatment area.

General monitoring to look for new encroachment areas

The Campground area moving towards the east towards the spillway area to the prairie dog colony will need to be monitored annually to make sure that there is ample space between the colony and humans in this area. As of now the prairie dogs are located in the group camp sites area, but as they expand their colony they will be encroaching closer to the main campground with high human activity. Once the colony enters into the exclusion zone control measures will be necessary to keep a safe distance from human activity areas. This area is expressed in our long term strategy map and an exclusion zone is shown.

Plague monitoring

Frequent checks will be conducted by park staff to monitor the possibility of plague outbreaks in prairie dog colonies. The discovery of dead prairie dogs not killed by predators is one possible indication of plague, particularly if there has been a sudden drop in activity at a colony. Closure of specific plague infested campgrounds and restricted access to hazardous areas may be warranted in cases when active animal plague is observed. The park staff will review the management plan and its objectives every 2-3 years.

6. EDUCATION STRATEGY

Wildlife is an important theme addressed throughout Cherry Creek State Park's Interpretive Master Plan. A proposed wayside interpretive sign from that plan would teach visitors about the thriving wildlife communities that exist on the grasslands, including the numerous benefits prairie dogs have on other native species. An informational brochure targeting park visitors who ask questions about prairie dog management should be developed, emphasizing prairie dog conservation & management and explaining why control methods have been chosen.

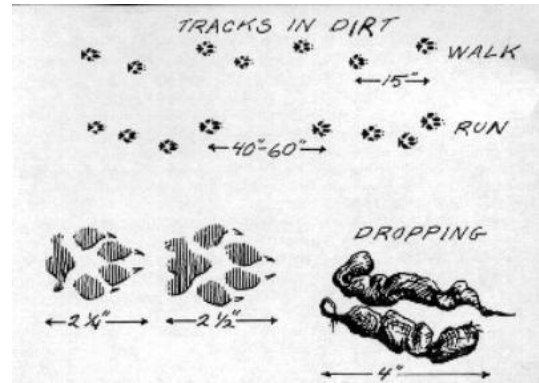
In the event of a plague outbreak, fact sheets, pamphlets, or a 1 page handout should be made available to the public that explains the effects of plague on prairie dog communities and health risks to humans.

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NON-TARGET SPECIES SIGNS

Coyote dens are typically dug into hillsides and are about 12" to 24" across. They are much bigger than prairie dog burrows and often more horizontal. Larger vegetation near the burrows are typical for coyote or fox dens, but would be very unlikely for prairie dog burrows. Often there are prey remains around the den as well as coyote hair and scat. The following pictures are examples of coyote dens, tracks and scat.



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The picture below illustrates a fox den. Fox dens vary in size and shape, but all look quite different from prairie dog burrows, but are somewhat hard to distinguish between coyote burrows. To the right is a set of red fox tracks.



American Badger dens (pictured below) are usually an elliptical shape being wider than they are tall. Typical entrance sizes are approximately 12" wide by 8" tall. These dens are relatively easy to differentiate between prairie dog burrows because they are much larger, they dig somewhat horizontally and often claw marks are visible. There is also a pair of badger tracks shown.



Burrowing Owls use inactive prairie dog burrows to nest and raise their young, so the burrow itself would not look different in shape or size from an active prairie dog burrow. However it would be typical to see droppings, pellets or feathers at or around the entrance. The picture below shows owl droppings and pellets which owls regurgitate at the edge of a burrow. These and feathers are the types of signs to look for while monitoring potential treatment areas.



Controlling Prairie Dogs: Suggestions For Minimizing Risk To Non-Target Wildlife Species (from CDOW 2007)

This document provides information and guidance to applicators of rodenticides and users of concussive devices for prairie dog control to aid in minimizing the potential for incidental take of non-target wildlife species. The following suggestions are intended to assist these users in determining the presence of non-target wildlife species and minimizing any possible risk to them.

These suggestions do not preclude or override any applicable state or federal laws. Applicators must read, understand and follow the directions for the use of registered rodenticides or concussive devices. It remains the responsibility of the applicator/device user to appropriately select and use products in accordance with licensing requirements, label restrictions and any other applicable state or federal law.

1. Consult with wildlife agencies

Applicators should consult with the Division of Wildlife and the U.S. Fish and Wildlife Service to determine if federal or state endangered or threatened species or species of special concern may be present in the area proposed for treatment. Some prairie dog rodenticides require applicators to contact the U.S. Fish and Wildlife Service prior to beginning the process of application. If at any point in the treatment process, it is determined that endangered or threatened species or species of special concern may be present, treatment-related activity should be postponed until further guidance is provided by the appropriate wildlife agency.

2. Inspect area prior to treatment

While a variety of wildlife species may use the general area, efforts to minimize possible risk to non-target species should focus on those wildlife species that are likely to come in direct contact with the selected rodenticide or inhabit a burrow to which a concussive device may be applied. Since different rodenticides pose different threats to different species, the presence of non-target wildlife species should be considered when selecting the control method. For example, possible risk to grain-eating non-target wildlife may be reduced by using fumigants rather than treated baits when those species are present.

Any attempt to determine the presence of non-target wildlife species should include an interview with the landowner or site manager, as well as at least one on-site inspection. The applicator should ask what wildlife species have been observed, when during the day and year (some nontarget wildlife species may only make seasonal use of the area in question) they were observed, how frequently they were observed and whether the landowner or site manager is aware of the presence of any federal or state endangered or threatened species or species of special concern. A companion document describes survey protocol for the detection and protection of nesting burrowing owls.

Sightings and evidence of the presence of non-target wildlife species can be influenced by time of day, time of year, weather and disturbance. Applicators should take those factors into account when scheduling their site visits. Any additional rodenticide label requirements regarding pre-application site visits must also be complied with, including, but not limited to, any requirement for multiple site visits prior to application.

Pre-baiting prior to the use of treated baits provides an additional opportunity for applicators to determine if non-target wildlife species are present.

A site inspection should include consideration of evidence of the presence and use of burrows by prairie dogs, as well as evidence of the presence of non-target wildlife species such as recent tracks, scat, pellets, feathers, burrow type, calls, etc.

- Fresh Scat Applicators should determine if scat near or in the burrow is that of prairie dogs. Prairie dog scat is 3/4 – 1 1/4" long, light colored to brown, and composed of fresh or dried plant material. If other scat is present, a non-target wildlife species may be using that burrow.
- Fresh Tracks Applicators should determine if tracks near or in the burrow are those of prairie dogs. Wildlife field guides should be used to identify tracks of prairie dogs and non-target wildlife species. If tracks other than prairie dogs are present, a non-target wildlife species may be using that burrow.
- Burrows Applicators should determine if the burrow is being actively used by prairie dogs. Prairie dog burrows show dirt mounded up around the entrances, 3-5" in diameter with single or multiple entrances. Evidence of modifications to a prairie dog burrow, such as enlargements or different excavation patterns, may indicate that other non-target wildlife species may be using the burrow.

3. Application of Prairie Dog Rodenticides or Use of Concussive Devices

Applicators should not apply prairie dog rodenticide or use a concussive device in any burrow that does not show evidence of active use by prairie dogs. Inactive prairie dog burrows or burrows that show evidence of use by other non-target wildlife species should not be treated by either method.

Note: It is the responsibility of the applicator to read and follow the label directions for the specific rodenticide being used. Failure to do so is a violation of state and federal laws.

Rodenticide labels also provide specific information about avoiding incidental poisoning of threatened or endangered species.

4. Post-Application Site Visit

Applicators should conduct a post-application site inspection of all treated areas to determine efficacy of the treatment for prairie dogs and possible impact to non-target wildlife species. Any take of non-target wildlife species should be reported to the Division of Wildlife.

revised 03/2007

See also "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls When Conducting Prairie Dog Control", Colorado Division of Wildlife 03/2007

RECOMMENDED SURVEY PROTOCOL AND ACTIONS TO PROTECT NESTING BURROWING OWLS WHEN CONDUCTING PRAIRIE DOG CONTROL

(From CDOW 2007)

Western Burrowing Owls (*Athene cunicularia hypugaea*) are commonly found in prairie dog towns throughout Colorado. Burrowing owls require prairie dog or other suitable burrows (e.g. badger) for nesting and roosting. Burrowing owls are migratory, breeding throughout the western United States, southern Canada, and northern Mexico and wintering in the southern United States and throughout Mexico.

Federal and state laws prohibit the harming or killing of burrowing owls and the destruction of active nests. It is quite possible to inadvertently kill burrowing owls during prairie dog poisoning projects, removal of prairie dogs, destruction of burrows and prairie dogs using a concussive device, or during earth moving for construction. Because burrowing owls often hide in burrows when alarmed, it is not practical to haze the birds away from prairie dog towns prior to prairie dog poisoning/removal, burrow destruction, or construction activity. Because of this, the Colorado Division of Wildlife recommends surveying prairie dog towns for burrowing owl presence before potentially harmful activities are initiated.

The following guidelines are intended as advice on how to determine if burrowing owls are present in a prairie dog town, and what to do if burrowing owls are detected. These guidelines do not guarantee that burrowing owls will be detected if they are present. However, adherence to these guidelines will greatly increase the likelihood of detection.

Seasonal Timing

Burrowing owls typically arrive on breeding grounds in Colorado in late March or early April, with nesting beginning a few weeks later. Active nesting and fledging has been recorded and may be expected from late March through early August. Adults and young may remain at prairie dog towns until migrating to wintering grounds in late summer or early autumn. Surveys should be conducted during times when burrowing owls may be present on prairie dog towns. Surveys should be conducted for any activities occurring between March 15th and October 31st. No burrowing owls are expected to be present between November 1st and March 14th.

Daily Timing

Burrowing owls are active throughout the day; however, peaks in activity in the morning and evening make these the best times for conducting surveys (Conway and Simon 2003). Surveys should be conducted in the early morning (1/2 hour before sunrise until 2 hours after sunrise) and early evening (2 hours before sunset until 1/2 hour after sunset).

Number and locations of survey points

Burrowing owls are most frequently located visually, thus, obtaining a clear view of the entire prairie dog town is necessary. For small prairie dog towns that can be adequately viewed in their entirety from a single location, only one survey point is necessary. The survey point should be selected to provide unobstructed views (with binoculars if necessary) of the entire prairie dog town (burrow mounds and open areas between) and all nearby structures that may provide perches (e.g., fences, utility poles, etc.)

For prairie dog towns that can not be entirely viewed from a single location because of terrain or size, enough survey points should be established to provide unobstructed views of the entire prairie dog town and nearby structures that may provide perches. Survey locations should be separated by approximately 800 meters (1/2 mile), or as necessary to provide adequate visual coverage of the entire prairie dog town.

Number of surveys to conduct

Detection of burrowing owls can be highly variable and multiple visits to each site should be conducted to maximize the likelihood of detecting owls if they are present. At least three surveys should be conducted at each survey point. Surveys should be separated by approximately one week.

Conducting the survey

- Weather Considerations Because poor weather conditions may impact the ability to detect burrowing owls, surveys should only be conducted on days with little or no wind and no precipitation.
- Passive surveys Most burrowing owls are detected visually. At each survey location, the observer should *visually* scan the area to detect any owls that are present. Some burrowing owls may be detected by their call, so observers should also *listen* for burrowing owls while conducting the survey.

Burrowing owls are frequently detected soon after initiating a survey (Conway and Simon 2003). However, some burrowing owls may not be detected immediately because they are inconspicuous, are inside of burrows, or are not present on the site when the survey is initiated. We recommend that surveys be conducted for 10 minutes at each survey location.

- Call-broadcast surveys To increase the likelihood of detecting burrowing owls, if present, we recommend incorporating call-broadcast methods into burrowing owl surveys. Conway and Simon (2003) detected 22% more burrowing owls at point-count locations by broadcasting the primary male (*coo-coo*) and alarm (*quick-quick-quick*) calls during surveys. Although call-broadcast may increase the probability of detecting burrowing owls, most owls will still be detected visually.
- We recommend the following 10-minute timeline for incorporating call-broadcast methods (Conway and Simon 2003, C. Conway pers. commun.). The observer should scan the area for burrowing owls during the entire survey period.
 - 3 minutes of silence
 - 30 seconds call-broadcast of primary call (*coo-coo*)
 - 30 seconds silence
 - 30 seconds call-broadcast of primary call (*coo-coo*)
 - 30 seconds silence
 - 30 seconds call-broadcast of alarm call (*quick-quick-quick*)
 - 30 seconds silence
 - 4 minutes of silence

Calls can be broadcast from a “boom box” or a portable CD or cassette player attached to amplified speakers. Calls should be broadcast loudly but without distortion.

Compact discs recordings of this survey sequence are available free of charge by contacting:

David Klute
All-bird Conservation Coordinator
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
Phone: 303-291-7320
Email: David.Klute@state.co.us

Identification

Adult burrowing owls are small, approximately 9-11 inches. They are brown with white spotting and white barring on the chest. They have long legs in comparison to other owls and are frequently seen perching on prairie dog mounds or other suitable perches (e.g., fence posts, utility poles) near prairie dog towns. Juvenile burrowing owls are similar to adults but smaller, with a white/buff colored chest that lacks barring.

General information about burrowing owls is available from the Colorado Division of Wildlife website: <http://wildlife.state.co.us/WildlifeSpecies/Profiles/Birds/BurrowingOwl.htm>

Additional identification tips and information are available from the U.S. Geological Survey Patuxent Wildlife Research Center website: <http://www.mbr-pwrc.usgs.gov/id/framlst/i3780id.html>

What To Do If Burrowing Owls Are Present

If burrowing owls are confirmed to be present in a prairie dog town, there are two options before proceeding with planned activities:

1. Wait to initiate activities until after November 1st or until it can be confirmed that the owls have left the prairie dog town.
2. Carefully monitor the activities of the owls, noting and marking which burrows they are using. This is not easy to accomplish and will require considerable time, as the owls may use several burrows in a prairie dog town. When all active burrowing owl burrows have been located and marked, activity can proceed in areas greater than 150 feet from the burrows with little danger to the owls. Activity closer than 150 feet may endanger the owls.

Reference

Conway, C. J. and J. C. Simon. 2003. Comparison of detection probability associated with Burrowing Owl survey methods. *Journal of Wildlife Management* 67:501-511.

revised 03/2007

See also: "Controlling Prairie Dogs: Suggestions For Minimizing Risk To Non-Target Wildlife Species" Colorado Division of Wildlife 03/2007