CITY OF BOULDER OPEN SPACE & MOUNTAIN PARKS
Prairie Dog Working Group
66 S. Cherryvale Road, Boulder, CO 80303
March 20, 2017
Final Meeting Summary

ATTENDANCE

Participants: Dan Brandemuehl, Kristin Cannon, Patrick Comer, Aaron Cook, Keri Konold, Jeff Edson, Deborah Jones, Amber Largent, Amy Masching, Valerie Matheson, Andy Pelster, Carse Pustmueller, Eric Sims, Jr., Lindsey Sterling Krank, Heather Swanson, John Vickery.

Expert Presenter: Dan Tripp

Facilitation: Heather Bergman, Sam Haas

ACTION ITEMS

Peak Facilitation	Create and send out a spreadsheet that lists the criteria developed by the Working Group.
Any Working Group member	E-mail Heather Bergman if you are planning on presenting a proposal or (multiple proposals) at the next meeting.

PUBLIC COMMENT

As discussed by Working Group members during the first meeting, the first ten minutes of the meeting were dedicated to both verbal and written public comment. There were no verbal or written public comments at this meeting.

EXPERT PRESENTATION: KNOWING MORE ABOUT THE PLAGUE

Dan Tripp, a Wildlife Disease Researcher in the Wildlife Health Program of Colorado Parks and Wildlife (CPW), presented research on options for plague mitigation.

What Is the Plague and Where Did It Originate?

- The plague is a bacterial disease that causes infection in humans and animals and can lead to septic shock.
- The plague is endemic to Asia and Africa. Over 200 mammalian species have been reported with the plague worldwide. During the Black Death, the plague spread to North and South America through every major port. The plague was introduced to the wildlife population through the Bay Area port then spread through the West.
- There are two types of human infections of the plague: the bubonic plague and the septic/pneumonic plague. The bubonic plague is flea-borne, takes two to six days to incubate, causes swollen lymph nodes, and is fatal if left untreated for 40-60 percent of cases. Septic/pneumonic plague is contracted through direct contact, has a short incubation period of one to four days, requires intensive medical support, is fatal within three to six days if left untreated.

- The first reported case of the plague in Colorado was in San Miguel County in 1941. The plague was reported in prairie dogs during the 1940s.
- The plague is now established among ground squirrels, rock squirrels, wood rats, prairie dogs, chipmunks, mice, voles, and rabbits.

The Plague and Prairie Dogs

- There are five species of prairie dogs that have a historic range in North America. They tend to inhabit semi-arid grasslands and intermountain valleys.
- There have been range-wide reductions in prairie dog abundance largely due to habitat conversion, eradication efforts, and the plague.
- Prairie dogs are highly susceptible to epizootic outbreaks. When an epizootic plague spreads through a colony, there is a near 100 percent mortality rate within a six- to twelve-week period.
- Other wildlife species are impacted by the plague, including black-footed ferrets, mountain plovers, burrowing owls, swift foxes, badgers, snakes, raptors, and lynx. Most carnivore species have antibodies that can fight off the plague.

Forms of Mitigation

- Fleas can be controlled with Deltamethrin (Delta Dust). Delta Dust is a Synthetic Pyrethroid Insecticide that has a recommended dosage of four to five grams applied into the prairie dog burrows.
- Typically, Delta Dust is applied to burrows within the perimeter of a colony mapped using GIS systems. This method is labor-intensive, slow, and reactive, but it effectively manages fleas for eight to ten months. After ten months, that area reverts to an "unprotected" status.
- Fleas are active year-round. However, there are certain months when flea activity is higher. For black-tailed prairie dogs, there are balloons of flea activity in March – April and August – September. The recommended time to apply Delta Dust is during the fall.
- The sylvatic plague vaccine (SPV), also referred to as the recombinant raccoon poxvirus, has been shown to lead to more than a 90% survival rate of black-tailed prairie dogs. There have been similar positive responses from Gunnison's prairie dogs and Utah prairie dogs. Young prairie dogs are more responsive to vaccination than old prairie dogs.
- The U.S. Department of Agriculture Center for Veterinary Biologics granted approval for experimental use of the SPV. CPW entered a collaborative research effort with the City of Fort Collins' Natural Areas, trialing the bait acceptance rate for the black-tailed, white-tailed, and Gunnison's prairie dogs. The baits were effective and palatable in the field and in burrows.
- Field safety was also tested. There was no evidence of adverse impacts in the prairie dogs that were tested (black-tailed prairie dog and Gunnison's prairie dogs) or in other wild rodents that consumed the SPV baits. Prairie dogs were tested for general injuries and illnesses, oral lesions, and viral infections.
- During the second phase of the experimental research, CPW and the City of Fort Collins' Natural Areas monitored three blocks of land in the Soapstone Prairie

Natural Area. They measured the uptake of vaccine and placebo baits by prairie dogs on study plots and their survival over a three- to five-year period. They also measured prairie dog and small mammal survival on dusted areas to compare. They used the presence or absence of fleas to determine whether there was plague on the study sites.

- They also measured small mammal vaccine uptake and survival on the three study plots which were all between 16 and 74 hectares.
- CPW and the City of Fort Collins' Natural Areas measured plague by monitoring carcasses and fleas on prairie dogs and in burrows. They measured prairie dog survival and abundance. On the three plots, they found that both Delta Dust and the vaccine protected prairie dogs from the plague. While neither mitigation technique was perfect (Delta Dust provided immediate protection, while the SPV provided longer-term protection), both forms of mitigation were found to be effective. CPW also found that it was necessary to treat the whole colony or complex of prairie dogs and that efficient production distribution was vital.
- Lessons from this multi-year study included:
    - The best time to distribute baits is in the fall (August/September/October). This will ensure optimal bait uptake and target juveniles.
    - The size of the treatment matters. Small vaccinated plots get overwhelmed by the plague, and vaccinated survivors often fragment or disperse.
    - SPV is not a reactive tool to manage epizootic plague.
    - Herd immunity can build over time when multiple doses are given to multiple generations.
    - Bait application rates can be customized for a specific goal or species.
    - Successful plague control will require multiple tools, including insecticides and vaccines.
- CPW is now interested in researching the use of the SPV to build prairie dog populations to level that supports the reintroduction of the black-footed ferrets. They would also like to answer questions about the duration of the treatment.

CLARIFYING QUESTIONS

Members of the Prairie Dog Working Group asked clarifying questions about Dan Tripp's presentation. Questions are indicated in italics.

When will the Armory colony be vulnerable to the plague and when should their Southern Grassland Habitat Conservation Area (SGHCA) burrows be dusted?

It can be assumed that plague is at the site. By the time there is evidence of plague at the site it will be too late for any mitigation to be effective.

Has anyone researched the impact of plague mitigation on insects and other non-target species?

Plague mitigation can decrease insect communities, but they typically rebound quickly. There was a higher abundance of deer mice, which are an indicator species, on dusted sites than there were on non-dusted sites.

Is there a relationship between the size of the prairie dog colony and plague success?
Smaller isolated colonies stand a better chance of getting out of the way. Plague is everywhere, and there are no studies that indicate any pattern to the types or sizes of colonies targeted.

What type of mitigation plan would you recommend for this group?
The first step is to write a comprehensive management plan, then the Working Group might want to consider funding, commitment, and community input. The plague creates turbulence for prairie dog management because populations can surge then drop suddenly. If the goal is to remove this element from the equation, then plague mitigation in prairie dog management areas may be the best approach. However, plague management should only be pursued in areas where there is an interest in keeping a sustainable number or prairie dogs.

Is there any information about resistance in the fleas to the insecticide?
Any form of mitigation continually used on the same colonies has a high potential of leading to insecticide resistance. There are reports from Africa of fleas that have become resistant to Delta Dust after multiple treatments. Management plans should include multiple mitigation tools.

Has there been any research that shows resistance in the prairie dogs to the plague?
That is a topic of research throughout the West. Some would argue that the plague impacts prairie dogs so strongly that they have little opportunity to develop resistance to it. However, there is more resistance to the plague in Colorado where prairie dogs have been exposed to the plague for over 100 years.

What is the licensing process to access the vaccine?
The SPV must be used responsibly as per the license agreement in the exact areas designated in the agreement. There is no room to make a mistake. It will take time to move from smaller research plots to a larger management scale. Any proposed use of the SPV would have to have a research component.

Are there other experiments across the U.S. like the one presented?
Yes, the experiment cited during this presentation is one of 39 similar sites across the U.S.

ARMORY RELOCATION DEBRIEF
Heather Swanson, Wildlife Ecologist of Boulder Open Space and Mountain Parks, Lindsey Sterling Krank, Director of the Prairie Dog Coalition, and Carse Pustmueller, an independent environmental services professional, each offered their perspectives on the Armory relocation effort.

Armory Debrief Presentation by Heather Swanson

- The Armory relocation site availability was determined based on the receiving site criteria. City of Boulder staff determined the relocation priorities in May 2016.

- The public and the Armory site owner requested use of the receiving site for Armory prairie dogs. The City Manager checked with City Council to determine the relocation to be beneficial. City Council then directed staff to relocate the prairie dogs that faced a direct lethal threat and an agreement was signed with the developer to allow the contractor to move the Armory prairie dogs to the Damyanovich receiving site. The developer paid a fee and hired a contractor.
- The City installed ten nest boxes, provided by the Prairie Dog Coalition, on the site. The contractor trapped 152 prairie dogs at the Armory site and moved them to the Damyanovich site. The Prairie Dog Coalition flushed the Armory site for two days and captured and moved an additional prairie dog.
- Everything associated with the Armory relocation was consistent with existing policies and plans. At the level of operational practices, however, there were no policies that determined the fee paid by the developer to the City. There was also an exception made to the practice of avoiding the installation of nest boxes due to non-native vegetation at the Damyanovich site. The prairie dogs continue to do well at the Damyanovich site. The prairie dogs continue to use nest boxes and natural burrows, and they have re-opened or dug additional burrows.
- This was a controversial project. The controversy was focused on the methods (nest boxes versus augured burrows versus natural burrows), the use of Delta Dust to minimize plague at the receiving site, and the qualifications of the relocation contractor. There were also changes to the methodology after the contractor was hired and communication difficulties with the contractor. The timing of the project was extremely tight and it dominated staff work for over three months.

Armory Debrief Presentation by Lindsey Sterling Krank

- The Prairie Dog Coalition was trying to relocate 20 acres of displaced prairie dogs in the Boulder City limits in 2015 (the Armory development and the Naropa development).
- The City did a census of their colonies and reported back to the Prairie Dog Coalition that they would not be able to accommodate the two relocation requests. The City told the Prairie Dog Coalition that there were only 16 acres of grassland that met their relocation criteria, and they had plans to use it for relocation from public lands.
- The Prairie Dog Coalition responded to City, arguing the following points:
    - There are few urban prairie dogs left;
    - There are a lot of unoccupied urban grasslands;
    - This would be a win-win with a conservation fee;
    - Decision-makers would agree.
- City staff agreed to hold a City Council meeting to resolve the issue. Council directed City staff to start a pilot program and establish the Prairie Dog Working Group. The City and the developer negotiated a conservation fee. Every step of the relocation was difficult. Three was a lot of discussion about the relocation methodology. The Prairie Dog Coalition had determined that receiving burrows were the best method, but City staff did not want to use them.

Armory Debrief Presentation by Carse Pustmueller

- There are several lessons from the Armory relocation that can help inform the Prairie Dog Working Group objectives. The Prairie Dog Working Group should focus on prairie dog conservation to avoid a repeat of the Armory relocation difficulties. It is also important to build trust in the City's implementation of its prairie dog policies.
- There are several necessary actions for fulfilling Council's direction to avoid lethal means of prairie dog management. The Wildlife Protection Ordinance, specifically the six-step process must be amended so that more receiving sites are eligible for relocation. The City must create a formal policy that allows relocations from private to public lands when there is an imminent threat of lethal control. The City must also provide effective plague management.
- Effective plague mitigation includes the use of Delta Dust in conjunction with vaccination. Prairie dog conservation areas and the SGHCA have recurrent plague endemics that have killed past colonies. In 2015, 1067 prairie dogs were moved to SGHCA and almost all died eight months later. The Armory Colony that was relocated to the SGHCA without any plague mitigation is currently at risk of plague unless dusting occurs right away. Additional colonies should not be moved to the SGHCA until there has been effective plague management on the site.
- It is important to remember that relocation is not a conservation tool and should only be used as a last resort. Many prairie dogs die during relocation. There should be an increased reliance on alternate methods such as fencing and passive relocation to allow some colonies designated for removal to remain where they are and to only relocate those colonies most threatened.
- In 2016, prairie dogs occupied only 3,625 acres out of the 6,603 acres designated for prairie dog use. Of these acres, only 16 acres are available for relocation in 2016. The Prairie Dog Working Group should consider the following suggestions for increasing the number of receiving sites:
    - Increase the occupancy range (currently set at10-26 percent);
    - Revise the criteria used to determine prairie dog habitat for receiving sites;
    - Consider the balance between agriculture and wildlife habitat, including prairie dogs;
    - Research the best way to decrease the number of removal areas;
    - Purchase land that can be earmarked for large blocks of prairie dog habitat to create adequate habitat for commensal species like the black-footed ferret;
    - Create a conservation fund from the landowners' fees to buy land for prairie dog habitat.
- The Prairie Dog Working Group should consider the following suggestions for relocation and accommodation criteria:
    - There should be an increased focus on selecting the relocation contractor based on skill and experience. Contractors should only be in the business of conservation, not extermination. The City (not the landowner) should choose the relocation contractor.
    - In terms of accommodation criteria at qualified receiving sites, the City should use viable existing burrows and provide nest boxes as needed before

the prairie dogs are moved to adequately supplement existing burrows. Augured holes are outdated and inhumane and should not be used.

- The City needs a Comprehensive Prairie Dog Conservation Plan with the goal of long-term prairie dog conservation. This plan should include:
    - The creation of sustainable large blocks of active prairie dog habitat that can also sustain black-footed ferrets and other commensal species
    - Effective plague management, particularly in the SGHCA where plague is recurrent
    - The use of Delta Dust to kill plague-carrying fleas in combination with the use of the sylvatic plague vaccine
    - Adequate accommodation for prairie dogs at release sites

RICHARDSON II RELOCATION DEBRIEF

Heather Swanson, Wildlife Ecologist of Boulder Open Space and Mountain Parks, Val Matheson, Urban Wildlife Conservation Coordinator of the City of Boulder, and Lindsey Sterling Krank, Director of the Prairie Dog Coalition, offered their perspectives on the Richardson II relocation effort.

Richardson II Debrief Presentation by Heather Swanson and Val Matheson

- The Richardson relocation site was identified as a prairie dog conservation area. After the Grassland Plan was approved in May 2010, the City evaluated relocation needs. The City manager designated the Foothills Park and the Hartnagle Open Space as removal sites. The contractor was identified but the relocation permitting process was delayed until 2011 because the timing was too tight.
- Public comment forms were sent out to neighbors. The primary themes and issues that were identified through the public process included:
    - Decrease in property value
    - Misuse of taxpayer money
    - Increased plague risk
    - Damage to the habitat on the Richardson property
    - Recreational conflict
    - Private property damage
    - Unsustainable prairie dog density
    - Insufficient public process
    - Increased attraction of predators dangerous to humans and pets
    - Increased road kill
    - Danger to livestock on adjacent property
    - Inappropriate site for prairie dogs
    - Increased threat of the plague in dogs and pets
    - Threat to schools and churches
    - High probability of prairie dog population spread into Open Space Areas
    - Dust and erosion
    - Insufficient response to community concern
- The City evaluated possible mitigation options, including:
    - Funding passive relocation in the buffer zone next to houses

    - Maintaining an un-mowed buffer zone between the colony and private property to the west
    - Providing technical support for a barrier construction on the private property
    - Installing raptor perches
    - Providing educational signs about the plague and prairie dog ecology
    - Relocating prairie dogs into existing burrows only
    - Offering other barriers made of vegetation, cloth, vinyl, or metal (note: barriers can be effective at slowing down the spread of colonies onto adjacent properties, but there has been no proof of long-term management).
    - Dusting the receiving site with insecticide
    - Waiting for another receiving site
- The City submitted their application in June 2011, and it was rejected in July 2011. CPW explained that the mitigation plan failed to address escape control issues or establish an effective buffer zone. It also failed to provide for the active control of the prairie dog colony to prevent expansion onto neighboring property. The colony has since expanded and occupies approximately 111 acres. It is at full capacity.
- There were several areas of controversy associated with the Richardson II relocation. There was a sense of disenfranchisement of community members from Boulder City government. People in the community, especially the people on adjacent properties to the relocation site, did not share the City's goal of limiting lethal control.

Richardson II Debrief Presentation by Lindsey Sterling Krank

- The Prairie Dog Coalition advocated for the Foothills colony to stay and lost twice in front of Council. Richardson Open Space is a prairie dog conservation area. Of the 45,000 acres included in the Open Space system, 24,000 are designated as grasslands and only 3,000 of those grasslands acres are occupied by prairie dogs. Of the 3,000 acres occupied by prairie dogs, the prairie dogs are a priority on only approximately 500 acres.
- The Prairie Dog Coalition offered several mitigation options including the use of Delta Dust, the creation of a tallgrass buffer zone, passive relocation with the technician paid for by the Prairie Dog Coalition, and private land removal.
- CPW denied the permit for social reasons under the auspices of biological reasons, prairie dog conservation areas were not used for their designated purposes, and prairie dog conservation areas were reduced by 100 acres. *Note that the CPW representative maintained that the reasons were not biological and that CPW knew the social causes.*

CRITERIA FOR FUTURE PRAIRIE DOG WORKING GROUP RECOMMENDATIONS

The Working Group discussed criteria to evaluate proposed recommendations to the City Manager regarding non-lethal relocation techniques, practices, or policies.

- It minimizes the potential for a controversy or conflict;
- It meets Council's goal to be compatible with social, economic, and environmental feasibility and values;

- It is measurably ecologically sustainable;
- It complies with all the appropriate regulations;
- It is both directly and indirectly humane and non-lethal;
- It has the largest possible benefit to associate species;
- It protects biodiversity and the overall health of the natural system;
- It is based on the most recent and credible scientific data and assessment information;
- It uses effective plague mitigation methods;
- It supports Open Space and Mountain Park's ability to meet the goal of preservation and conservation of multiple Grassland Plan targets (relevant targets include black-tailed prairie dogs and associated species, mixedgrass prairie mosaic, xeric tallgrass prairie, mesic bluestem prairie and agricultural operations);
- It focuses on the long-term survival of colonies;
- It increases public understanding and trust;
- It encompasses broad City of Boulder values;
- It allows for flexibility;
- It has clarity in purpose, goal, and method;
- It does not prioritize one land use over another in the multiple objective areas;
- It minimizes the potential for unanticipated or unknown consequences;
- It solves a problem;
- It avoids a repeat of Richardson or Armory relocations;
- It considers all stakeholders.

NEXT STEPS:

- Peak Facilitation will create a spreadsheet that lists the criteria. When proposals are presented during the next meeting, each member of the Working Group can use this spreadsheet to rate the ideas on a scale of one to three (privately). Both the combined tallied results and the anonymous individual rankings will be sent to the Working Group. This data will be used to inform decisions.
- Any Working Group member with a proposal will have the opportunity to present it at the meeting on April 10. Each presentation should be approximately five minutes long.
- Anyone planning to present an idea should e-mail Heather Bergman with the number of ideas that they plan to present.