



**CITY OF BOULDER
CITY COUNCIL AGENDA ITEM**

MEETING DATE: May 7, 2019

AGENDA TITLE

Prairie Dog Working Group Update and Recommendations

PRESENTER/S

Jane S. Brautigam, City Manager
Yvette Bowden, Director of Parks and Recreation (P&R)
Dan Burke, Interim Director of Open Space and Mountain Parks (OSMP)
Chris Meschuk, Interim Planning Director
Steve Armstead, Interim Deputy Director, OSMP
Jeff Haley, Planning, Design and Community Engagement Manager, P&R
John Potter, Resource and Stewardship Manager, OSMP
Jim Robertson, Comprehensive Planning Manager, Planning
Regina Elsner, Parks Planner, P&R
Joy Master, Natural Lands Coordinator, P&R
Val Matheson, Urban Wildlife Coordinator, Planning
Andy Pelster, Agricultural Stewardship Supervisor, OSMP
Heather Swanson, Ecological Stewardship Supervisor, OSMP

EXECUTIVE SUMMARY

The purpose of this Memorandum is to provide City Council with an update on staff implementation of the Prairie Dog Working Group (PDWG) recommendations, as well as to provide additional analysis and implementation planning that considers fiscal, staffing, timing and other resource trade-offs.

This packet also provides information on related topics of interest that have arisen since the Dec. 11, 2018 council study session (information on that study session can be found [here](#)) including updates on current citywide prairie dog management, potential conflicts

with neighboring landowners, conflicts around agricultural use on OSMP property and prairie dog relocation.

The forty-two recommendations of the PDWG Phase II work are wide-ranging and have broad implications. Staff organized these recommendations into categories based on the level of resources necessary for implementation and the consistency, or lack thereof, with existing plans and policies. Recommendations in categories 1 and 2 can be implemented with no changes to city plans or policy (36 recommendations). Recommendations in categories 3 and 4 require plan and policy changes (6 recommendations). The list of Phase II recommendations and staff categorization are provided in **Attachment D**. A summary of the Phase II recommendations and where to find the detailed discussion within this memo is included in **Attachment E**.

Most of the Phase II recommendations in category 1 and 2 (29 recommendations) are currently being implemented or are proposed for future workplans and their status can be found in **Attachment B1**.

Due to the amount or nature of work required for seven of the recommendations in category 2, staff collected further information and developed implementation plans that modify the scopes of work for installation of barriers, relocation, and addressing conflict areas. In addition, due to competing priorities in departmental budgets and staff availability, staff is recommending that some strategies (for education, mapping of conflict areas, development of new habitat evaluation tools and partnerships) be deferred until a later time (**Attachment B2**).

This memo accompanies a written report (**Attachment A**) that analyzes the category 3 and 4 recommendations, evaluates implementation considerations and trade-offs, and recommends next steps for further implementation planning, budgeting and management action. Staff is recommending that many of these recommendations be implemented as part of future planning processes that can incorporate public review and feedback and full consideration of trade-offs and implications. For recommendations that can move forward in parallel with these planning processes (i.e., plague management plan development, black-footed ferret reintroduction), recommendations for phasing and additional work to be done over the next few years is presented.

Staff believes that with current budget requests and plans for 2020 and 2021, progress can be made on most of the PDWG recommendations including holding a public meeting on an annual basis to update the community on the implementation of the recommendations, provide updates on management and collect feedback.

In addition to this analysis of Phase II PDWG recommendations, the OSBT and City Council has expressed interest in further information regarding mitigation of conflict between prairie dog occupation and agricultural production on OSMP lands. Analysis of this specific issue is addressed in **Attachment B3**. As with OSMP properties, P&R properties also have the potential need for conflict mitigation with private neighbors. Analysis of private neighbor conflicts is included in **Attachment B4**.

Questions for City Council

1. Does City Council support the staff recommendation for implementation of the PDWG Phase II recommendations?

COMMUNITY SUSTAINABILITY ASSESSMENTS AND IMPACTS

- **Economic** - Implementation of these recommendations based on staff recommendations for phasing and scaling would require an enhanced level of resource allocation including staff time as well as operating and capital budgets. Unmanaged prairie dog occupation may cause economic impacts not directly related to the city expenditures in their management. Examples of this are that occupation in irrigated lands may reduce agricultural lease revenues or reduce the value of city water rights used to irrigate these lands, prairie dogs encroaching upon state-mandated areas such as detention ponds or assets such as ball fields could result in safety issues, fines, or lost revenue; and neighbors to city lands may have increased costs to control prairie dogs spreading onto their properties.
- **Environmental** - Protection of prairie dogs and associated species is essential to maintaining healthy, functioning grassland ecosystems on natural lands owned and managed by the city. The PDWG recommendations include a variety of strategies designed to increase protection of prairie dogs and prairie dog colony ecosystems. City plans and policies strive to strike a balance between protecting and maintaining healthy, thriving prairie dog populations and protecting natural communities that do not thrive with prairie dog occupation. High quality grassland communities include a mosaic of habitat types and species. Changes to protection and management focused primarily on prairie dogs may reduce the ability to protect and manage for other natural community types and species that do not thrive with prairie dog occupation (e.g. tallgrass prairie, rare and imperiled butterflies and skippers, ground-nesting and tallgrass prairie birds). Loss of healthy, diverse, functioning grassland ecosystems on natural lands owned and managed by the city may lead to soil loss and reduce the ability of these areas to sequester carbon and otherwise offset the impacts of climate change.
- **Social** - Impacts to the community include benefits associated with improved inclusion of key stakeholders when implementing prairie dog management practices and updating or revising related plans and policies. Key stakeholders may include, but are not limited to, private landowners, neighbors, agricultural operators, prairie dog advocates, people who are pesticide sensitive, soil health experts, grassland ecosystem experts and advocates, prairie dog relocators, city staff and departments and other government agencies. These recommendations are also intended to reduce the number of conflict areas related to prairie dog populations including conflicts with maintaining irrigated agricultural land and impacts to neighboring landowners.

BOARD AND COMMISSION FEEDBACK

In April and early May, staff presented the PDWG update and recommendations to three city boards – Open Space Board of Trustees (OSBT), Parks and Recreation Advisory Board (PRAB), and Environmental Advisory Board (EAB), and sought the general

thoughts and considerations of the boards to be shared with the City Manager and City Council. **Questions asked of the boards were:**

1. Does the board support the staff recommendations for phased implementation for the PDWG Phase II recommendations, including support for the staff recommendations to modify the scale and, in other instances, deferring select Phase II recommendations?
2. Are there any other policy/strategy recommendations or feedback that were not addressed in this memo related to prairie dog management that the board would like to provide?

Both OSBT and PRAB expressed agreement with question #1 and support for the staff recommendations related to implementation of the PDWG Phase II Recommendations.

In addition, in response to question #2, OSBT recommended items outside the scope of the Phase II PDWG recommendations related to managing conflict between prairie dogs on OSMP irrigated agricultural lands, suggested changes to the city's relocation prioritization established in Phase I of the PDWG, and recommendations surrounding staffing and funding.

Feedback from both OSBT and PRAB is detailed in **Attachment C**. The meeting with EAB occurred on May 1, after the deadline for submitting this memo. Their feedback will be provided in advance of the meeting.

BACKGROUND

The City of Boulder's current prairie dog management practices affect numerous stakeholders who are concerned about a wide variety of impacts including those to prairie dogs, grassland ecosystems, agricultural use, human health, and private and public lands. At the Aug. 16, 2016 City Council meeting, council members suggested the city form a working group that could suggest, based on a broad understanding of the full range of community perspectives, prairie dog management practices. The City of Boulder formed the Prairie Dog Working Group (PDWG) in 2016 including 12 community members representing a variety of viewpoints and five staff from OSMP, Parks and Recreation (P&R) and Planning. The working group completed their work and presented the resulting recommendations to the City Manager in two phases, the first was completed in 2017 and the second in 2018.

Outcomes from the PDWG were presented to OSBT, PRAB, EAB in August 2018. Memos and minutes from these meetings with full background and reports from the PDWG can be accessed by visiting the Dec. 11, 2018 council study session information linked above.

Following these meetings with the three boards, staff performed further analysis of the recommendations to group them into four categories (**Attachment D**):

Category 1: Recommendations that could be implemented within the framework of existing plans and policies and with existing staff and resources.

Category 2: Recommendations that could be implemented within the framework of existing plans and policies but would require additional staff and/or resources. These were further subdivided into:

Category 2a: Those category 2 recommendations that could be implemented in a more immediate timeframe and could begin to be worked into budget requests as early as 2020 or 2021; and

Category 2b: Those category 2 recommendations that could be implemented over a more extended timeframe due to high resource needs, or reliance on completion of other recommendations prior to implementation. These recommendations could begin to be incorporated into budget request in 2022 or later.

Category 3: Recommendations that are not consistent with current plans or policies, and/or include substantial trade-offs with other city priorities but could be implemented with current staff and resources.

Category 4: Recommendations that are not consistent with current plans or policies and/or include substantial trade-offs with other city priorities and require additional staff and/or resources to implement.

This grouping and the full Phase II recommendations were presented to City Council at a study session on Dec. 11, 2018.

During the study session, City Council discussed several issues associated with the recommendations and staff committed to return with further analysis of the Category 3 and 4 recommendations as well as additional information on items related to prairie dog management.

ANALYSIS

Prairie dog management and conservation has been the focus of city and community attention for decades. Currently, P&R, OSMP, and Planning are the departments primarily involved in management of prairie dogs and conservation of prairie dog and associated species communities.

Current City Resource Allocation

P&R manages approximately 450 acres of occupied prairie dog colonies. Approximately 250 of these acres occur on natural lands designated for grassland conservation and 200 acres are on properties with planned future park development. P&R allocates 0.6 FTE and between \$10,000-\$150,000 annually on prairie dog related management.

The Planning department does not manage any City lands with prairie dogs but is responsible for implementing citywide prairie dog policies and the Urban Wildlife

Protection Ordinance as it relates to prairie dog management on City lands and private lands within the city. Staff spends approximately \$6,500 and 0.2 FTE annually on prairie dog related management.

OSMP manages over 25,000 acres of grassland, agriculture and associated habitats. Within this, a subset is suitable habitat for prairie dogs and up to 6,775 acres have had prairie dog colonies. Currently (2018 mapping), OSMP has 4,153 acres of active prairie dog colonies. Annually, OSMP spends approximately 1.72 FTE and \$10,000-\$150,000.

Staff Analysis of PDWG Phase II Recommendations in Categories 3 and 4

Full detail on staff analysis, recommendations and proposed timing on Category 3 and Category 4 recommendations are included in **Attachment A**, and a summary table is included in **Attachment E**. Below is a brief narrative summary of these recommendations.

Category 3 Recommendations

Recommendations in Category 3 are those that are not consistent with current plans or policies, or have substantial trade-offs associated with them, but are feasible with current staffing and resources.

1. PDWG Recommendation: Add additional criteria to the designation of future Prairie Dog Conservation Areas (PCAs) in the Grassland Ecosystem Management Plan (GMAP) to consider the level of conflict with adjoining properties.
 - Staff Analysis and Recommendation: Due to interrelated strategies, goals and objectives for a variety of natural and agricultural resources, staff recommends that changes to criteria for PCA determination be included in a full, comprehensive review and update to the GMAP. The scheduling of this update would occur as part of implementation planning following the completion of the OSMP Master Plan in Q3 2019.
 - To create citywide consistency in the application of newly updated criteria and modeling, P&R recommends utilizing OSMP's standard and criteria. P&R specific inventories and monitoring could occur in the two years following the update to the GMAP and following the department's update to the Parks and Recreation Master Plan (anticipated for 2020 and 2021).
 - Estimated Costs: OSMP- 1 FTE, P&R- \$50,000
 - Estimated Timing: 2021-2023
2. PDWG Recommendation: Complete and implement a plague management and monitoring plan using proven-effective state-of-the-art plague management techniques to secure sustainable and plague-resistant prairie dog colonies.
 - Staff Analysis and Recommendation: Staff recommends that the interim plague management plan (sylvatic plague vaccine at Southern Grasslands and for all prairie dogs to be relocated, delta dust at sending site of relocation and insecticidal spray on all relocated prairie dogs) be continued for 2019. During the fourth quarter of 2019, staff would begin to do a full evaluation of tools

available for plague management following the Integrated Pest Management process of the city. This analysis would highlight benefits, issues, and trade-offs associated with the use of all available tools to manage plague on city properties. Following this analysis, staff would draft a plague management plan to be released for review to the public and decision makers by the first quarter of 2020.

- Estimated Costs: OSMP- 100 hours, P&R- 90 Hours, Planning- 110 hours
- Estimated Timing: 2019-2020

Category 4 Recommendations

Recommendations in category 4 are those that are not consistent with current plans or policies and/or include substantial trade-offs with other city priorities and require additional staff and/or resources to implement.

1. PDWG Recommendation: Work with local experts to review the modeling method and data inputs to provide an updated prairie dog habitat suitability model and GMAP target viability criteria to map current conditions for the mixed grass prairie mosaic and prairie dog colonies across the relevant grassland landscape to serve as guidance for plan updates.
 - Staff Analysis and Recommendation: Updating the GMAP prairie dog habitat suitability model would commence following completion of the most recent efforts to map vegetation on the OSMP system. This would ensure that information is up-to-date and can best inform the update. The relevant mapping is scheduled to be finished in 2021. Staff recommends that the update to the model begin in 2021 or 2022 and funding for contractor assistance with the effort be included in departmental budgets at that time. This work would necessarily be completed prior to a comprehensive review and update of the GMAP, which would be scheduled as part of implementation planning for the OSMP Master Plan.
 - Following the comprehensive update to the GMAP, the criteria developed would be evaluated and applied consistently across all city properties with the potential to become future release sites. P&R would request funds to ensure compatibility of data and applicability of the new modeling method to P&R property and prairie dog colonies.
 - Estimated Costs: OSMP- 0.2 FTE and \$50,000, P&R- \$25,000
 - Estimated Timing: 2021-2023
2. PDWG Recommendation: Work with local experts to update and implement GMAP goals relevant to prairie dogs along with receiving site location criteria (I-1) to fully utilize existing grassland receiving sites and to allow additional qualified grassland receiving sites.
 - Staff Analysis and Recommendation: Due to interrelated strategies, goals and objectives for a variety of natural and agricultural resources, staff recommends that changes to goals and objectives related to prairie dogs and receiving site criteria be included in a full, comprehensive review and update of the GMAP. The scheduling of this update would occur as part of

implementation planning following the completion of the OSMP Master Plan in Q3 2019. Additional resources and staffing as needed to complete this recommendation would be included in the overall budget requirements for this plan update when scheduled.

- To create city-wide consistency in the application of newly updated criteria and modeling, P&R recommends utilizing OSMP's standard and criteria. P&R specific inventories and monitoring could occur in the two years following the update to the GMAP.
 - Estimated Costs: OSMP- included in #1 for Category 3 recommendations
 - Estimated Timing: 2021-2023
3. PDWG Recommendation: Work with adjacent landowners, including the County of Boulder and adjacent counties, US Fish & Wildlife Service, other federal partners, and private landowners in the Grassland Preserves to create and implement a black-footed ferret recovery plan for the southern Boulder Region.
- Staff Analysis and Recommendation: Due to the complexity of ferret reintroduction and the trade-offs for other resource protection (agricultural, other natural resources) associated with focusing management on ferrets, staff recommends that feasibility and desirability be further examined by staff in 2020 and 2021. Staff would return to decision makers and the public at the end of 2021 with a recommendation on whether the city should actively pursue ferret reintroduction in the near term, as conditions on the ground allow (prairie dog occupancy levels). In the meantime, staff would continue to support prairie dog recovery in the Southern Grasslands through relocations and use of the sylvatic plague vaccine. In addition, OSMP staff would continue to participate in ferret recovery planning team meetings, and foster communication and collaboration with likely partners in ferret re-introduction (i.e., Boulder County, US Fish and Wildlife, Colorado Parks and Wildlife).
 - Estimated Costs: OSMP- 0.2 FTE
 - Estimated Timing: 2020

Staff Analysis of PDWG Phase II Recommendations in Categories 2(a) and 2(b)

Due to the scope of the PDWG recommendations, staff has collected further information and formulated implementation recommendations on some of the recommendations originally categorized as 2a and 2b. Recommendations within these categories were those that could be implemented within the framework of existing plans and policies but would require additional staff and/or resources. Those categorized as 2a were thought to be able to be implemented in 2020 or 2021 and those in 2b could be implemented in 2022 and beyond. Through budgeting and further work on these, staff has some additional information that is helpful for implementation planning, phasing and scheduling. Full detail on staff analysis and recommendations on Category 2a and Category 2b recommendations are included in **Attachment B2** and a summary table is included in **Attachment E**.

Summary of Staff Recommendations

Overall, staff is in the process of implementing or including 29 of the 42 PDWG Phase II recommendations in budgets and workplans. For the remaining recommendations (including those detailed above in categories 3 and 4), staff recommends the following:

Implementation Recommendation	Prairie Dog Working Group Recommendation
Include in upcoming budgets and workplans	<ul style="list-style-type: none"> - Help fund prairie dog conservation and conflict mitigation through establishing a fee for private landowners relocating prairie dogs to city land, establishing a grassland conservation fund, working with philanthropic organizations (2021) - Create plague management plan (2019/2020) - Work toward black-footed ferret introduction (2020/2021)
Include as part of the update to the Grassland Ecosystem Management Plan (schedule to be determined through OSMP Master Plan Implementation)	<ul style="list-style-type: none"> - Update habitat suitability modeling - Update relocation criteria - Update goals and objectives related to prairie dogs
Implement with modified scope	<ul style="list-style-type: none"> - Provide barriers on agricultural lands - Provide barriers adjacent to private property - Increase relocations each year - Address 10% of conflict areas annually
Defer until additional staff or resources are available or higher priority initiatives are complete	<ul style="list-style-type: none"> - Pilot habitat quantification tool for acquisitions - Increase education on prairie dog conservation - Create public surveys related to prairie dogs

Implementation Recommendation	Prairie Dog Working Group Recommendation
	- Increase plague education

Issues with Trade-offs that will Require Future Decisions Prior to Implementation

Because the City in general, and OSMP and P&R have charters with multiple goals and priorities, determining the appropriate balance in managing for each resource often comes with trade-offs and impacts to success in managing another resource. Prairie dog conservation is no exception to this. While conserving prairie dogs and their associated species is necessary to have intact, functioning ecosystems and to meet goals for preserving this keystone species, prairie dogs are not consistent with irrigated agriculture or park development and high levels of prairie dog occupation may negatively impact natural grassland communities that do not thrive with prairie dog occupancy. As a result, many of the PDWG recommendations come with difficult trade-offs and policy decisions that will need to be made in the process of implementation. Some of these that will need to be discussed, and determined for implementation are:

Effective Conflict Mitigation

- Appropriate use of public resources for expensive prairie dog barriers on City and private land given that barriers are a deterrent, not a preventative, so are not 100% effective. Therefore, prairie dogs may continue to occupy sites that currently cause conflict with neighboring landowners or city owned agricultural lands
- Fragmentation of landscapes, weed infestation and impediments to other wildlife movement resulting from extensive barrier fence installation.
- Appropriate level of investment, and available tools to recover and protect agriculturally important lands and support agricultural lessees.

Responsible Use of Budget and Staff Resources

- How to best balance the staff time and funding required to fully implement PDWG recommendations with other city and departmental priority work that city staff do to maintain and enhance other aspects of the city's natural ecosystems, park assets and programs and the infrastructure necessary to support local agricultural operations and recreation.
- The potential to increase the budget and length of time for projects, thus limiting a department's ability to manage lands (such as park development).

Protecting and Conserving Healthy Diverse Grasslands

- Appropriate balance to maintaining and increasing prairie dog dominated ecosystems, while still protecting other grassland communities, soil health and ecosystems that do not thrive with prairie dogs.
- Disturbance to intact grassland communities from increasing relocations and installation of required (from Phase I) structures (often artificial burrows).
- Impacts of a focus on black-footed ferret recovery and potential impacts to overall grassland health, secondary impacts of plague management, and impacts to agricultural lessees and recreation in large grassland habitat blocks.
- Evaluating appropriate use of plague management to meet prairie dog conservation goals while considering secondary impacts of insecticides (e.g. insecticide use in high quality grasslands) to arthropods and other species (e.g. rare butterflies/skippers, ground nesting native bees, burrowing owls, etc.).

ATTACHMENTS:

- **Attachment A** – Report on Analysis of Category 3 and 4 recommendations
- **Attachment B** – Additional Information, and Background Information
 1. Update on implementation of Phase I recommendations and those in category 1 and 2(a)
 2. Discussion of Category 2 items which have been deferred, or for which additional information is relevant
 3. Analysis of conflict mitigation opportunities on OSMP agricultural properties
 4. Discussion of neighbor conflict mitigation- scale and options
 5. Relocation opportunity on OSMP
 6. Revised Draft IPM Policy
- **Attachment C** – Board Feedback and Recommendations
- **Attachment D** – Prairie Dog Working Group Recommendations and Categorization for Implementation
- **Attachment E** – Summary of Recommendation Information in Attachments A and B
- **Attachment F** – Prairie Dog Occupation Through Time on City lands
- **Attachment G** – Map of All City Prairie Dogs
- **Attachment H** – Map of Prairie Dog Colony Overlap with Irrigated Agriculture on OSMP

Attachment A. Analysis of Prairie Dog Working Group Phase II Recommendations Categorized as 3 and 4 (not consistent with existing plans and policies)

Category 3- Recommendations that are not consistent with current plans or policies, and/or include substantial trade-offs with other city priorities, but could be implemented with current staff and resources

3.1 Add additional criteria to designation of future PCAs in the Grassland Management Plan to consider the level of conflict with adjoining properties.

Benefits of implementation:

Implementation of this recommendation would address issues encountered through implementation of the Grassland Ecosystem Management Plan (GMAP). The intention of Prairie dog Conservation Areas (PCAs) were to designate colonies that would not only offer protection to prairie dogs during times that colonies were occupied, but also to serve as receiving sites for relocated prairie dogs when colonies were not fully occupied. These sites are areas where prairie dogs have occurred, and no substantial conflicts with other OSMP management goals exist (no high-quality rare plant communities, agriculture, etc.). However, through implementation, it was discovered that for some of these PCAs, substantial neighbor objections exist to relocation of prairie dogs to some of these colonies. In 2011, a permit for relocation was denied for the Richardson II colony on OSMP property outside Gunbarrel. The reasons related to neighbor objections and the lack of tools (lethal control, barriers, etc.) to contain populations of relocated prairie dogs to the open space property. Considering the adjacent properties and perceived attitudes of adjacent landowners to the prospect of prairie dog occupation and relocation on the open space property would prioritize PCA designation on colonies where future conflicts are less likely to arise and where relocation plans are more likely to be successful.

As other city lands including Parks and Recreation (P&R) will be potential release sites for prairie dogs, criteria evaluated for OSMP's GMAP should be applicable and feasible across the city properties. This will create consistency for determining city release site potential. P&R does not currently have a prairie dog management plan in place. Once criteria for habitat suitability are evaluated, it will enable P&R to determine overall suitability of a site given other competing priorities.

Timing and recommended process:

Changes to criteria associated with management designation of prairie dog colonies with the OSMP GMAP and resulting changes to management designation of colonies would be best accomplished as part of a full update of the GMAP. The distribution and extent of conservation vs. management areas impacts a variety of GMAP goals and objectives including those related to conservation of prairie dogs, conservation of species associated with prairie dogs, conservation of grassland target communities including mixed grass prairie and xeric tallgrass prairie, and sustainable agricultural operations. As a result, staff recommends that changes to the criteria or designation of properties should not be undertaken outside of a more holistic evaluation and update to the plan.

The process for a full update of the GMAP would likely mirror the process undertaken when the plan was initially created in 2010. Staff crafted the draft plan, which then underwent extensive public review and comment, revision and final approval by the Open Space Board of Trustees (OSBT) and City Council (CC). A broad update of the plan would include multiple opportunities for public input and review of recommended changes as well as opportunities for both OSBT and City Council to review, comment and eventually accept the changes.

Currently OSMP is undertaking completion of the first OSMP Master Plan. The Master Plan will help inform planning processes including updates to existing ecosystem plans like GMAP. Implementation planning following completion of the Master Plan will identify priorities and schedules for updates to key plans including the Forest Ecosystem Management Plan, Grassland Ecosystem Management Plan, and Visitor Master Plan.

As other city lands including P&R property will now be open as release sites for prairie dogs, existing criteria of OSMP's GMAP need to be applied in addition to any changes in criteria. Staff recommends not performing the analysis twice and waiting until the GMAP is updated to evaluate and utilize the additional criteria for other city property as potential release sites.

Estimated Cost and Staffing Required- Phasing and Timeframe:

Cost and staffing required for updating criteria for designation of prairie dog management areas would be included in resource needs for the full update of the GMAP. The work will require approximately 1 FTE over an 18-month period from OSMP (including staff from wildlife, agriculture, grassland ecology and planning). This need falls within the current staffing allocations for planning processes and would need to be considered with other planning priorities for work planning and phasing of planning needs.

Potential release sites on properties other than OSMP property, including P&R property do not have existing inventory and baseline data. That data needs to be collected as necessary to evaluate potential release sites based on current and future criteria. P&R has approximately 390 acres of occupied prairie dog habitat that may become available due to a colony collapse in the future. This need does not fall within existing funding or staffing allocations. The data collection and inventory work would require approximately \$50,000 in additional funding, competing with other departmental priorities.

Implications for other Priorities/goals:

Prairie dog conservation areas as established in the GMAP provide for places where prairie dogs can be conserved while colonies are occupied, associated species can be supported with the presence of prairie dogs, and in times of low populations, prairie dogs can be moved from areas of high conflict to PCAs. As a result, the location and extent of PCA's has implications for the scale of overall prairie dog and associated species protections within the GMAP framework, as well as supporting mitigating conflict on areas where prairie dogs are inconsistent with other management goals and objectives (e.g. irrigated agricultural areas). In addition, the use of PCAs as receiving sites for prairie dogs reduces the need to use areas within larger grassland preserves if populations are high in these areas, or vegetation conditions are poor due to drought, long-term

prairie dog occupation, or other causes. As a result, changing the evaluation of and designation of PCAs will need to consider the associated goals and objectives related to irrigated agriculture, prairie dog conservation and diverse grassland community protection in the GMAP.

Trade-offs or identification of difficult decisions required:

The most important trade-off related to changing the criteria for establishing PCAs is the process by which this change would be made. Although the recommendation envisioned quick changes, staff feel that the changes are best handled in a broader update to the GMAP with the appropriate processes involving the community and decision makers. Decisions will be made at this time how to evaluate neighbor attitudes toward prairie dogs and how to incorporate that information into criteria related to PCA designation. Information gathered related to neighbor conflict through implementation of other PDWG recommendations in the next several years can help inform these decisions.

Recommended next steps:

Staff will consider the potential changes to criteria for PCA designation while designing outreach and education focused on better understanding conflict with adjacent neighbors and adjacent landowner perspectives on prairie dogs. Staff will implement changes to designation criteria and designation of areas as PCAs into a broader, more comprehensive update to the GMAP within a timeframe deemed appropriate through OSMP Master Plan Implementation Planning. This will ensure that this update process includes appropriate levels of public participation and decision maker approval to ensure long-term success in implementation of the updated plan.

Following the comprehensive update to the GMAP, the criteria developed should be evaluated and applied consistently across all city properties with the potential to become future release sites.

3.2 Complete and implement a plague-management and monitoring plan using proven-effective state-of-the-art plague management techniques to secure sustainable and plague-resistant prairie dog colonies.

Benefits of implementation:

Prairie dogs are crucial to grassland ecosystems and a thoughtful and science-based plague management plan can decrease the risk of plague and increase the longevity of prairie dogs. This also benefits the plants and other wildlife that are associated with grassland ecosystems that are dependent on prairie dog colonies.

An interdepartmental staff team recently assessed ecological issues and challenges as part of the city's climate action and resilience programs. This team is currently developing guidelines for a citywide Integrated Ecosystems Strategy to protect and enhance ecosystem services. The development of a plague management plan that protects grassland ecosystems aligns with the objectives of this initiative.

Timing and recommended process:

Underway (2018 – 2020) - Interim plague management plan includes:

- Existing practice - Burrows at sending sites are treated with Delta Dust (deltamethrin) prior to relocation as recommended by Colorado Parks and Wildlife relocation permitting process
- Existing practice - Individual prairie dogs from sending sites are treated with pyrethrin insecticide to treat fleas prior to relocation
- New practice - Prairie dogs at sending sites are treated with plague vaccine prior to relocation
- New practice - Existing prairie dog colonies at receiving sites in the Southern Grasslands are treated with plague vaccine

Fourth Quarter of 2019 – Development of background information and assessment for comprehensive plague management plan:

- Management options for *Yersinia pestis* or sylvatic plague will be assessed using the city's Integrated Pest Management process
 - Review scientific literature for thorough understanding of the plague lifecycle, potential routes of transmission, susceptibility of prairie dogs and other hosts, development of natural immunity, etc.
 - Review of scientific literature for both the efficacy and impacts of plague mitigation tools and practices
 - Consult with scientists about current research concerning plague management efficacy, non-target and ecosystem-wide impacts and long-term benefit
 - Analyze pros and cons of individual tools and combinations of management practices for prairie dog protection and non-target impacts, particularly insecticides such as Delta Dust and other insecticides that are currently being tested for prairie dog flea control, including systemic insecticides, fipronil and neonicotinoids.

First Quarter 2020

- Prioritize colonies that would receive plague mitigation (e.g. colonies where enhanced population levels are desired to meet Grassland Plan or other goals)
- Draft plague comprehensive plague management plan for review

Second Quarter 2020

- Collect community and decision-maker feedback and finalize plan

Estimated Cost and Staffing Required- Phasing and Timeframe:

Estimated cost and staffing required to develop a plague management plan includes approximately 90 hours staff time from Parks, 100 hours from OSMP, and 110 hours staff time from Planning over the next fourteen months.

Implications for other Priorities/goals:

A plague management plan, in conjunction with other prairie dog management objectives, aligns with other city goals and priorities.

Trade-offs or identification of difficult decisions required:

The development of a comprehensive plague management plan will require substantial staff resources and time commitments in the short-term. However, it can save the city resources in the longer term by providing proactive and sound management options.

Ecological issues are complex, and it can be challenging to determine the best management practices to avoid unanticipated harmful consequences in the long-term. There can be conflicting opinions in the scientific community about the best approach. Staff will consider a wide scope of literature and expert opinion to review ecological interactions and follow the Integrated Pest Management policy to promote the stability of desirable species and discourage pest populations, while sustaining the natural balances within the ecosystem.

Recommended next steps:

- Continue implementing interim plague management plan during 2019, first half of 2020
- Complete comprehensive plague management plan by the second quarter of 2020.

Category 4- Recommendations that are not consistent with current plans or policies and/or include substantial trade-offs with other city priorities, and require additional staff and/or resources to implement

- 4.1 Work with local experts to review modeling method and data inputs to provide an updated prairie dog habitat suitability model and GMAP target viability criteria to map current conditions for the mixed grass prairie mosaic and prairie dog colonies across the relevant grassland landscape to serve as guidance for plan updates.

Benefits of implementation:

As part of the Grassland Ecosystem Management Plan creation (GMAP), OSMP staff created a habitat suitability model based on published literature on prairie dog habitat suitability and advice from ecologists and grassland experts. The suitability model has been helpful to inform management designation of prairie dog colonies within the GMAP framework and where suitability is highest for relocated prairie dogs to be put within receiving sites. This habitat suitability model is now 11 years old, and as a result, OSMP has acquired properties not included in the original model, and vegetation may have changed on some properties, so an update would be beneficial as part of updating the GMAP. In addition, the PDWG recommendation contains two elements that were not included in the original habitat suitability model- a focus on modeling within the mixed grass prairie mosaic, rather than all plant communities, and an inclusion of modeling on surrounding non-OSMP lands to get a larger picture of the landscape context of habitat suitability. Focusing the model on mixed grass prairie will reduce the

inclusion of plant communities not conducive to prairie dog occupation, allowing creation of a simpler (and thus easier to run and interpret) model that will focus more specifically on likely suitable habitat. Although data available for surrounding non-OSMP lands will not likely exist at the level of detail we have for OSMP lands (e.g., vegetation mapping to the alliance level of detail), a larger landscape perspective in suitability modeling will help to put OSMP lands into a larger context of potential areas for prairie dog conservation.

To create consistency across city property, any new modeling and data input should be applicable and feasible to apply city-wide. This will ensure a standard operating procedure across departments.

Timing and recommended process:

Updating the habitat suitability modeling requires availability of recent, up-to-date, comprehensive vegetation mapping. OSMP staff are in the process of completing the most recent mapping effort. Plans are that the needed portion of this data (upland grasslands) will be collected, compiled, analyzed and ready for use by 2021. Habitat suitability modeling could begin after that timeframe.

For habitat suitability modeling to be conducted across city properties, other department will have to gather the initial data to input into the model. Any data gathered will need to be consistent with OSMP methodologies and standards. This data could be gathered, compiled and analyzed by 2021 and ready for use by 2022.

As with the original habitat suitability modeling, staff will include information from the literature, and prairie dog and grassland ecology experts. An effort will also be required to collect data from adjacent landowners regarding grasslands on their properties. Staff anticipates working with an outside contractor to collect information and create the draft model. Once a draft model has been created, staff proposes to solicit comment from the public, including prior members of the prairie dog working group as part of a planned annual prairie dog update meeting. This feedback can inform modifications to the draft model before final analyses are completed by the contractor for use in the GMAP update. Timing for the GMAP update will be determined through implementation planning within the guidance of the OMSP Master Plan (due to be completed 3rd Quarter 2019). Phasing of deliverables required for this update will include information on habitat suitability modeling and the expected schedule for completion. Estimated cost and staffing required- phasing and timeframe

Creation of an updated habitat suitability model is anticipated to be done with help of an outside contractor with sufficient ecological, GIS and modeling experience to complete the process. Anticipated cost for this contract effort is approximately \$50,000 including background information collection, data collection and organization, draft model creation and final model creation. This process will require support from OSMP staff (wildlife ecologist, grassland plant ecologist, GIS analyst) equal to approximately 0.2 FTE during the year of completion. This work will be included in work planning and budgeting for OSMP in 2021 or 2022. These planning processes will determine whether this level of staff effort can be completed with existing staff, or if additional capacity is required.

P&R does not currently have the funding or staffing allocated to collect necessary inventory and baseline data to provide as part of an updated habitat suitability model. Anticipated costs to hire a consultant to review newly gathered data (from 3.1 above) and conduct the habitat suitability model for P&R property are \$25,000. This would be in addition to currently allocated funds and be in competition with other departmental priorities.

Implications for other priorities/goals:

Creation of a habitat suitability model can incorporate considerations of other priorities or goals. The original habitat suitability model created for the grassland plan included factors related to suitability for prairie dogs (e.g. appropriate soil and slope), as well as considerations of conflicts between prairie dogs and other grassland community types (e.g. rare plant communities that do not withstand prairie dog occupation were scored as low suitability). If a model was created that did not consider these trade-offs as part of the modeling process (focusing more specifically only on whether an area is suitable from a prairie dog perspective), then these trade-offs would need to be considered more specifically in application and use of the model in planning and decision making. PDWG recommendations to focus the model on mixed grass prairie will help to address some of these competing priorities by excluding some grassland communities that do not thrive with prairie dog occupation (e.g. xeric tallgrass prairie).

Trade-offs or identification of difficult decisions required:

Decisions surrounding habitat suitability modeling will be made throughout the process of completing the model. Decisions will need to be made around the degree to which the model will only address suitability from a prairie dog perspective, or if conflicts with other priorities or goals will also be incorporated.

Recommended next steps:

Staff recommend that updating the habitat suitability model be included in OSMP work planning and budgeting beginning in 2021 or 2022 along with other needs associated with updating information and data in preparation to update the GMAP as scheduled through OSMP Master Plan Implementation planning.

To create city-wide consistency in the application of newly updated criteria and modeling, P&R recommends utilizing OSMP's standards and criteria. P&R specific inventories and monitoring could occur in the two years following the update to the GMAP.

- 4.2 Work with local experts to update and implement GMAP goals relevant to prairie dogs along with receiving site location criteria (I-1) to fully utilize existing grassland receiving sites and to allow additional qualified grassland receiving sites.

Benefits of implementation:

The Grassland Ecosystem Management Plan (GMAP) was approved in 2010. Since that time, staff and the public have had the opportunity to examine how the plan has directed work to

conserve and manage OSMP's grasslands. Due to these lessons learned through implementation as well as changing conditions on the grounds and within the Boulder community, an update to GMAP goals will allow changes to be made where necessary to strike the appropriate balance of supporting all GMAP objectives and meeting the desires of the Boulder community.

Timing and recommended process:

Changes to goals related to prairie dogs and criteria associated with relocation would be best accomplished as part of a full update of the GMAP. The balance of conserving a variety of conservation targets (including prairie dogs) impacts a variety of GMAP goals and objectives including those related to conservation of prairie dogs, conservation of species associated with prairie dogs, conservation of grassland target communities including mixed grass prairie and xeric tallgrass prairie, and sustainable agricultural operations. As a result, staff recommend that changes to the GMAP goals and prairie dog relocation criteria not be undertaken outside of a more holistic evaluation and update to the plan.

The process for a full update of the GMAP would likely mirror the process undertaken when the plan was initially created in 2010. Staff crafted the draft plan, which then underwent extensive public review and comment, revision and final approval by the Open Space Board of Trustees (OSBT) and City Council (CC). A broad update of the plan would include multiple opportunities for public input and review of recommended changes as well as opportunities for both OSBT and City Council to review, comment and eventually accept the changes.

Currently OSMP is undertaking completion of the first OSMP Master Plan. The Master Plan will help inform planning processes including updates to existing ecosystem plans like GMAP. Implementation planning following completion of the Master Plan will identify priorities and schedules for updates to key plans including the Forest Ecosystem Management Plan, Grassland Ecosystem Management Plan, and Visitor Master Plan.

Estimated cost and staffing required- phasing and timeframe:

Cost and staffing required for updating criteria for designation of prairie dog management areas would be included in resource needs for the full update of the GMAP. The work will require approximately 1 FTE over an 18-month period from OSMP (including staff from wildlife, agriculture, grassland ecology and planning). This need falls within the current staffing allocations for planning processes and would need to be considered with other planning priorities for work planning and phasing of planning needs.

Implications for other priorities/goals:

In the creation of the GMAP, staff, community and decision makers discussed how to best strike a balance between the many goals and objectives of the GMAP including how to best conserve prairie dogs in large, diverse grassland habitat blocks with healthy and thriving grassland communities. Changes to the goals, objectives, and overall balance in these strategies may impact result in impacts related to irrigated agriculture, prairie dog conservation and diverse grassland community protection in the GMAP.

Trade-offs or identification of difficult decisions required:

Re-evaluation of the goals and objectives of the GMAP will require discussion and decisions regarding a number of trade-offs and difficulties in balancing the management of various OSMP resources. Some key decisions will likely focus on:

- attempts to continue to conserve prairie dogs while supporting sustainable agriculture in the context of non-lethal, conservation-based prairie dog management.
- finding opportunities for relocating prairie dogs into large native grassland habitat to support prairie dog occupation on these lands and reduce conflict elsewhere while still supporting conservation of grassland communities and species that do not thrive with prairie dog occupation (e.g. tallgrass, rare butterflies and skippers, grasshopper sparrows).
- providing adequate recovery time on relocation colonies so plant communities remain robust and best able to support prairie dogs and other conservation goals while supporting timely relocation opportunities to address conflict elsewhere on the system.
- How to best balance long-term prairie dog conservation in native grasslands where conditions including historic grazing regimes, long-term prairie dog occupation, drought and others have created situations where soil health and plant communities are compromised within the context of areas designated for prairie dog conservation

Due to the complex, and interconnected nature of these decisions and trade-offs, updates to the prairie dog related goals and objectives are best handled in the broader, holistic context of a full plan update with associated public process and decision-making.

Recommended next steps:

Incorporate updates and changes to prairie dog related goals and objectives in the GMAP into a broader, more comprehensive update to the GMAP within a timeframe deemed appropriate through OSMP Master Plan Implementation Planning. Ensure that this update process includes appropriate levels of public participation and decision maker approval to ensure long-term success in implementation of the updated plan and an appropriate balance of conservation objectives to meet the community's desire for long-term sustainability of the OSMP land system.

4.3 Work with adjacent landowners, including the County of Boulder and adjacent counties, US Fish & Wildlife Service, other federal partners, and private landowners in the Grassland Preserves to create and implement a black-footed ferret recovery plan for the southern Boulder Region.

Benefits of implementation:

Black-footed Ferrets are one of the most endangered mammals in the United States. Recovery efforts rely on successful reintroduction of ferrets into the wild on their required habitat-

occupied prairie dog colonies. Black-footed Ferrets have been extirpated from Boulder County and as a result, successful reintroduction would represent returning a native predator (and thus an important piece of the grassland ecosystem) to a landscape where it has been absent for many decades. In addition, Boulder's location presents substantial opportunities with ferret reintroduction for public outreach, education to help inspire stewardship for native grasslands, and increase understanding of conservation challenges and opportunities on OSMP and surrounding lands.

Timing and recommended process:

Timing related to actual reintroduction of ferrets relies heavily on occupation levels of prairie dog colonies in the southern part of Boulder County and northern part of Jefferson County. This area of OSMP (in combination with adjacent Boulder County lands) is the only area on City of Boulder land large enough to meet the current minimum requirements of Black-footed Ferret reintroductions. Sylvatic plague has reduced populations substantially in the area and has continued to be active in the area over the last several years. Boulder County has been taking plague mitigation actions for the last several years on their properties in the area including widespread use of delta dust (deltamethrin insecticidal dust) and sylvatic plague vaccine and has seen sustained growth in their populations. OSMP has completed several relocations to the area over the last few years and distributed sylvatic plague vaccine in 2018 to the area and will do so again in 2019. However, populations in the area currently do not meet the minimum thresholds of prairie dog occupation for successful ferret release (1500 acres). Reaching occupation levels that are sufficient may take several more years before ferret release could be feasible within the Federal recovery plan guidelines. Rocky Flats National Wildlife Refuge would likely also provide habitat for released ferrets, but at this time has very little occupied prairie dog habitat.

Currently, as has been the case for several years, OSMP staff continue to participate in the Colorado Black-footed Ferret Working Group, as well as attending meetings of the Federal Recovery Team when feasible. Conversations with potential partners (Boulder County, Rocky Flats (USFWS), Ferret Recovery Team, Colorado Parks and Wildlife) are ongoing.

However, given the lack of sufficient prairie dog colonies at this time, and the issues associated with trade-offs that would result from participation in ferret reintroduction, no formal commitment, or plan has been established for City of Boulder participation in ferret reintroduction. Staff recommend that internal staff conversations occur in the next 2 years (2020, 2021) to determine the feasibility and desirability of committing to ferret reintroduction followed by discussions with the public and decision-makers which would result in an official determination on whether the City will pursue future release of ferrets on their property along with adjacent collaborating landowners. Following this discussion, if the City has determined to move forward, more official planning would begin in 2021 with Federal Partners (USFWS) as well collaborating landowners (Boulder County, Rocky Flats, private landowners).

In the meantime, OSMP will continue to participate in forums and meetings related to Black-footed Ferret conservation and recovery in Colorado and act to support recovery of prairie dog populations in an effort to reach occupancy goals in the Grassland Ecosystem Management Plan

in the Southern Grassland Preserve through distribution of sylvatic plague vaccine and prairie dog relocations as feasible.

Estimated cost and staffing required- phasing and timeframe:

Interim internal planning steps to determine feasibility and desirability of pursuing ferret reintroduction can occur in 2020 and 2021 with current staffing and resources and will be incorporated into workplans during those years for appropriate staff. Near the end of 2021, staff will plan to report out to decision makers on the results of those discussions with recommendations for next steps. Following any decisions made at that point, if a commitment has been made to actively pursue ferret reintroduction, staff will begin to secure more formal agreements and plans with adjacent landowners, Federal and State partners. This process will require approximately 0.2 FTE in 2022. Following this process, actual timing for ferret reintroduction would be determined by USFWS, all participating landowners, and would be dependent on recovery of prairie dog populations to sufficient levels. The earliest that ferret reintroduction could occur would be 2023, although actual timing may be substantially later than that based on all factors that must be present prior to reintroduction.

Implications for other priorities/goals:

Preparing a site for ferret reintroduction and supporting a sustainable population after release requires substantial resources and focus on prairie dog conservation to support sufficient populations of prairie dogs to support the ferrets. Plague management is required to ensure long-term viability of the ferrets themselves, and the prairie dogs that support them. What would be required for plague management is not yet known, but some tools- especially insecticidal treatment with delta dust will have trade-offs for other grassland wildlife and goals. In addition, potential implications for conservation of rare plant communities that do not thrive with prairie dog occupation may arise if priority is given to ferret conservation. Finally, implications for agricultural lessees of the area are unknown, but would need to be considered in planning for reintroduction.

If ferrets were reintroduced current resources would not be sufficient to maintain the project. Additional staffing and funding would be required for monitoring, maintenance of thriving prairie dog populations, and other requirements and reintroduction commitments. Staff will further evaluate these needs to help inform decision-making surrounding the city's interest in committing to ferret reintroduction.

Trade-offs or identification of difficult decisions required:

Staff would strive to create a plan for reintroduction that would allow for continued balancing of multiple city goals (agriculture, grassland conservation, recreation, etc.) in the potential reintroduction area. However, it is likely that some trade-offs would be unavoidable and would need to be clearly understood and discussed prior to committing to ferret reintroduction. Staff will further evaluate and flesh these out as discussions progress in 2020 and 2021. In late 2021, staff will provide detailed assessment of these trade-offs to the public and decision makers for consideration in decision making around reintroducing ferrets.

Recommended next steps:

Staff will begin internal discussions in 2020 to determine the feasibility, trade-offs and other issues associated with ferret reintroduction. These conversations will conclude in 2021 with staff recommendations surrounding next steps in potential ferret reintroduction. In late 2021, staff will solicit public input and decision-maker direction in whether to proceed to implementation planning, interagency agreements and other steps necessary for ferret reintroduction.

4.4 Work towards the reintroduction of the black-footed ferret using connecting parcels from the public/private sector to achieve this goal as a natural strategy in PD management.

This recommendation is repetitive for recommendation 4.3 and thus is being combined with that recommendation for analysis.

4.5 Explore additional opportunities for relocations in Southern Grasslands by evaluating current relocation criteria, to alleviate conflicts in other areas.

This recommendation is repetitive of recommendation 4.2, and thus is being combined with that recommendation for analysis.

Attachment B. Additional Analyses and Background Information

Contents:

1. Update on Prairie Dog Working Group Phase I Recommendations and Phase II recommendations in Categories I and 2 (a)
2. Discussion of Category 2 items which are recommended to be deferred or for which additional analysis is needed
3. Analysis of conflict mitigation opportunities on OSMP agricultural properties
4. Discussion of neighbor conflict mitigation-scale and option
5. Relocation update and opportunities on Open Space and Mountain Parks
6. Draft Revised IPM policy
7. Board Feedback on PDWG Recommendations for City Council

Attachment B1. Update on Implementation of Prairie Dog Working Group Phase I Recommendations and Phase II recommendations in Categories 1 and 2 (a)

Phase I Implementation

Create guidelines and criteria for prioritizing relocation/take sites on both public and private lands.

Work on recommendation #1 was completed in 2017/2018. These guidelines are now being used to determine relocation priorities each year.

Create guidelines and criteria for prioritizing receiving sites on public lands within existing plans and develop recommendations for making receiving sites more feasible; develop recommendations for increasing landowner and stakeholder acceptance of the use of receiving sites.

Staff continue to evaluate all potential receiving sites for use each year. Additional work to make receiving sites more feasible and increase landowner and stakeholder acceptance has not yet occurred due to other high priority work items. However, sufficient receiving sites are anticipated to be available for planned relocations in 2019 and 2020. To address future relocations, this work with adjacent landowners is anticipated to be incorporated to workplans beginning in late 2020.

On approved receiving sites, ensure that the number of prairie dogs to be relocated have adequate accommodations, utilizing existing or artificial burrows (including nest boxes) and taking into consideration existing native vegetation.

For relocations occurring in 2016, 2017 and 2018, all prairie dogs were released into existing burrows or artificial nest boxes. During those three years, 88 artificial nest boxes were installed on the OSMP Damyanovich colony to accommodate the relocations. These boxes were installed in a portion of the colony comprised largely of non-native pasture grasses and avoiding areas of more intact native vegetation. In 2019, an anticipated 100+ artificial nest boxes will be installed at the Salstrand colony in the Southern Grasslands. Attempts will be made to cluster nest box to avoid areas of more sensitive or pristine vegetation.

Define successful prairie dog relocation; this includes continual evaluation of new or different relocation methods, ongoing opportunities for stakeholder engagement, and short-term, mid-term and long-term evaluation of success.

Definition of success continues, but monitoring of relocations completed in 2017 and 2018 suggest success- prairie dogs remain active in the area where they were released and the colony is growing. The City hopes to be able to use mark-resight to better monitor levels of survival and retention on the receiving site in future relocations.

Collaboratively prepare, with Colorado Parks and Wildlife, a research proposal for US Department of Agriculture approval for the use of the sylvatic plague vaccine (SPV) on the southern grasslands in 2018 and beyond.

The licensing for sylvatic plague vaccine is no longer an experimental license, removing the need to incorporate use of sylvatic plague vaccine into a specific research project. As a result, OSMP worked with Colorado Parks and Wildlife to obtain and apply sylvatic plague vaccine to all areas of occupied habitat in Southern Grasslands in 2018. Preparations are in progress to allow this application again in 2019. Monitoring of success is comprised of periodic observations and annual mapping of activity.

Phase II Implementation

Category 1 (consistent with existing plans and policies and feasible with existing resources and staffing) recommendations:

All translocated prairie dogs will receive plague abatement.

In 2018, all relocated prairie dogs received sylvatic plague vaccine prior to being relocated. This is in addition to State requirements for plague prevention including application of delta dust insecticidal dust to the sending site burrows and spraying prairie dogs with insecticide prior to release at the receiving site. In 2019, relocated prairie dogs will again receive sylvatic plague vaccine based on interim plague management plans (both prior to and after relocation).

Work with Integrated Pest Management (IPM) to ensure implementation of an acceptable policy that may limit the use of insecticides but allows such use on large prairie dog ecosystem colonies as necessary.

A revised IPM policy has been drafted (attachment B.6) and allows for the use of insecticides as necessary. Use of insecticides on large prairie dog ecosystems requires an understanding of the complexity of the plague cycle and how different plague management tools could impact the overall ecosystem as well as plague dynamics. Policy update expected to be finalized in the second quarter of 2019.

Recruit researchers from USGS, CSU, etc. to secure funding and implement a research plan related to contraceptive options in prairie dogs.

OSMP included contraceptive and other non-lethal mgmt. tools in the funded research call for proposals. No proposals were received for funding in 2019. Staff communicated with researchers at USDA Aphis and CSU who are involved in research on contraceptive options in prairie dogs. Researchers indicated that research trials were not yet at the phase where field trials were necessary. Staff will stay in contact with these and other researchers to evaluate the role that city land could play in any possible future field trials.

Ensure land developers follow newly proposed protocol for relocations.

All relocation from private land have followed all city protocols for relocation, including those resulting from the PDWG recommendations on relocation methodology. Staff will work in 2019 to create a write-up of all relocation methodologies required for use in future relocations from private land.

Have clear and consistent communication among all agencies.

In addition to ongoing collaboration between City Departments, staff will hold an annual meeting to discuss prairie dog management with staff from all relevant departments to ensure optimal communication and collaboration. OSMP staff periodically meet and often communicate with staff responsible for prairie dog management for Boulder County, City of Fort Collins, Jefferson County and Rocky Flats National Wildlife Refuge.

Review protocols and update as necessary.

Ongoing and will continue as PDWG recommendations for plan and policy changes are implemented.

Establish who to call when conflicts with illegal activity arise and when animal control cannot be reached.

Protocols have been established, and reports of illegal activity involving animals are forwarded to police officers after hours and other times when Animal Protection (previously Animal Control) are not available. Contact information is being published to the City website.

Lobby neighboring county commissioners and state legislators to advocate for these adjustments, providing protocols and language for legislation.

These issues continue to appear on the City's legislative agenda. Staff are reaching out to other agencies and potential partners in an attempt to build a coalition to support changes to State legislation prior to approaching lawmakers.

No less frequently than once, but no more frequently than twice a year, there will be a publicly-noticed meeting that includes invitations to members of the PDWG with an opportunity for the members to discuss progress on the ecological, social, and economic goals and strategies and contribute to the adaptive management process.

Staff are planning to hold a public meeting in the fall (likely October, date TBD) to update the public and PDWG on progress to date on these recommendations, relocation success for the year and other issues related to prairie dog management. This will be an annual meeting.

Category 2(a) and 2 (b) (consistent with existing plans and policies but requiring additional resources and/or staffing) recommendations:

Recommend departmental operating budget line items for prairie dog management in the budget.

The OSMP CIP budget requests for 2020 include \$395,000 for implementation of PDWG recommendations and prairie dog management/relocation.

P&R will implement a tracking measure in the Natural Lands Operations budget to track on-going maintenance and management specific to prairie dogs in 2020 in order to evaluate the need for potential future budget requests to aid in PDWG recommendation implementation.

Based on identified prairie dog occupied and relocation sites, update inventory and monitoring data for at-risk species associate with the mixed grass prairie mosaic and xeric tallgrass prairie.

Will be worked into departmental budgets beginning in 2022 as funding and staffing allows

Document relevant compatibilities of relevant land use and management options applicable to prairie dog relocation sites and occupied colonies (e.g., use of insecticides relative to rare insect species, density of prairie dogs relative to rare plant species).

Will be worked into departmental budgets beginning in 2022 as funding and staffing allow

In the near term, due to high occupancy of conflict areas, there is an increase in the number of successful translocations across the Boulder region.

Relocations in 2019 will likely exceed those previously completed by the City. However, this is not feasible in an ongoing way- see detail Attachment B2.

Pilot one property that has prairie dog colonies with managed buffer zones.

The Axelson East property has been identified for action in 2020, including passive relocation out of the irrigated field on the property and installation of a temporary barrier to keep prairie dogs from recolonizing the conflict area. Other properties will be prioritized for action in future years and funding will be including in OSMP Capital budget requests.

Complete policy review and initiate processes for policy amendments.

Processes for policy amendments are being evaluated. For OSMP specific policies, Master Plan Implementation Planning will determine the timeframe for these amendments.

Identify and map conflict areas annually and make it easily available to the public.

OSMP- Deferred in 2020 funding request due to other OSMP departmental priorities- will be included in future years as resources are available.

PR- Deferred for city-wide surveys to assist in identifying areas of conflict currently unknown.

Evaluate/Provide barriers or other exclusion/mitigation methods on agricultural lands (leased/private).

The Axelson East property has been identified for action in 2020, including passive relocation out of the irrigated field on the property and temporary barrier installation to keep prairie dogs from recolonizing the conflict area.

Collaborate with community partners (ex: Prairie Dog Coalition or Defenders of Wildlife) to implement conflict prevention strategy.

Will be worked into departmental budgets beginning in 2022 as funding and staffing allows

By end of 2019, initiate a pilot program to implement a conflict prevention strategy in at least two adjoining conflict locations.

Will be worked into departmental budgets beginning in 2022 as funding and staffing allows

Create surveys to gauge public awareness and concerns based on historical efforts.

Deferred- see detail in Attachment B2 in this packet.

Campaign for more public awareness, engage the public through technology, Boulder newsletters and community outreach programs. Presentations at local libraries, schools, Boy/Girl Scout troops and 4-H groups are ways to reach out to the community.

Deferred- see detail in Attachment B2 in this packet.

Provide Boulder residents opportunities to contribute to PD conservation through assistance with environmental monitoring and outreach programs.

Staff will work with volunteer coordination staff in 2020 to evaluate opportunities for additional volunteer involvement.

Better educate public about plague and update informational sites.

Partially deferred- see Attachment B2. 2019 and 2020 OSMP workplans include updating websites related to prairie dogs and ensuring consistency of information and ease of access and navigation.

Reevaluation of adaptive management practices.

Ongoing

Create and implement a required fee structure for private landowners relocating prairie dogs to city land.

In 2020 planning staff will initiate and lead an interdepartmental team to develop a fee for service. A fee study will be conducted to evaluate the direct and indirect costs of receiving prairie dogs from private property. The fee study will either be conducted through hiring a consultant (estimated cost of \$15,000-\$25,000), or by including the work associated with the fee study in city staff 2020 workplan. Implementation of the relocation fee is expected in 2021.

Work with conservation entities to identify conservation practices, programs and funding mechanisms that could support grassland restoration and the mitigation of conflicts on agricultural land.

Deferred in 2020 OSMP CIP prioritization.

By December 2019, staff will provide an annual report on the inflows and outflows.

Deferred until work on establishing grassland conservation fund complete

By 2019, staff will provide their respective department board or commission with annual updates on the status of goals and objectives as well as a review of, and advertisement on, inflows and outflows of the grasslands conservation fund.

Staff will update boards annually on goals and objectives. Updates on inflows and outflows of grassland conservation fund will be deferred until work on establishing grassland conservation fund is complete.

Annually ensure each relevant department has sufficient budgets, staffing and/or consultants to meet the prairie dog management goals and objectives.

OSMP- CIP requests related to prairie dogs include \$395,000 (which includes funding for an additional 2.5 standard and temporary staff) to allow the recommendations detailed here to be implemented.

P&R- Further evaluation is needed to determine additional funding requests, pending Board and Council direction on these recommendations, as well as other departmental funding priorities.

Create a pilot project with at least two outside organizations to help fulfill the PDWG goals and objectives by maximizing in-kind contributions.

Staff continue to investigate opportunities for in-kind donations to help with prairie dog management and relocation.

Track in-kind contributions on an annual basis and make data available for other funding opportunities.

Ongoing

Attachment B2. Discussion of Category 2 items which are recommended to be deferred, or for which additional analysis is needed

Evaluate/Provide barriers or other exclusion/mitigation methods on agricultural lands (leased city lands and private lands). (2a)

Staff have evaluated total conflict on agricultural lands and begun to analyze the scale of conflict with neighboring property owners. Due to the very large scale of neighbor conflicts, barrier installation does not appear to be feasible on a scale that would address the need. As a result, **staff recommend exploring alternative options including a potential city grant program to help contribute to expenditures by private landowners in the cost of establishing a barrier.** Additional information on neighbor conflicts is contained in Attachment B4. In relation to agricultural conflicts, staff conducted further analysis of the conditions on each agricultural property (details contained in agricultural conflicts analysis in this packet). The results of this analysis suggest that barriers or other exclusion methods may be effective tools on a small number of agricultural properties. Staff will incorporate these projects into budget requests and work planning in 2020 and 2021. In 2020, OSMF staff are requesting \$226,850 and 0.9 FTE plus temporary staff to address conflict on 5 agricultural properties. Four of these would be addressed through relocation and the fifth through passive relocation and erecting a temporary (fabric or straw) barrier. This work would address 16.8 acres of agricultural conflict areas or approximately 1.5% of the current conflict. However, for the majority of agricultural properties, **staff recommend that plans be put together that allow rapid response to implement this recommendation following plague, when efforts to exclude prairie dogs or contain prairie dogs in small portions of properties are likely to be feasible and cost effective while populations are at much lower levels.**

In the near term, due to high occupancy of conflict areas, there is an increase in the number of successful translocations across the Boulder region. (2a)

Based on past relocations, a reasonable number of prairie dogs to relocate in a single year is 400-700. The logistics, costs, time and contractor availability associated with relocations makes it difficult to support a larger scale relocation in most years. **As a result, staff recommend continuing to do relocations each year as feasible- based on receiving site availability, conditions on conflict areas, and prioritization as discussed in Attachment B3 and the overall citywide prioritization criteria created by the PDWG.** However, continual increases in size of relocation each year is not feasible and would require substantially more resources and take staff and money away from implementing other PDWG recommendations and investments in non-relocation conflict mitigation projects. City staff do not control the rate of relocation undertaken by others in the Boulder Region but will remain engaged with agency partners and provide support as feasible for their relocation planning and implementation.

Pilot application of a habitat quantification tool to score parcels being proposed for new acquisitions or easements related to prairie dog conservation. (2b)

As part of acquisition planning, staff currently evaluate the natural resource values or potential of all potential acquisitions, including any benefits or costs to prairie dog conservation and

management. It is unlikely on potential acquisitions that sufficient data will be available to inform a quantitative model for prairie dog conservation, and this would not provide substantially different information than is currently evaluated by staff prior to purchasing. Staff recommend that all future potential acquisitions continue to be evaluated for natural resource values, including those associated with prairie dogs. If a habitat quantification tool is developed by others and provided to the City of Boulder, city staff could evaluate the benefit of use of such tool within the framework of the OSMP acquisition plan and other departmental prioritization information for land acquisition. **Staff does not recommend spending staff resources or funding on developing such a tool at this time.**

Evaluate/Provide barriers on City of Boulder land adjoining high-conflict areas on neighboring private land. (2b)

As discussed in Attachment B4, the potential scale of neighbor conflicts is very large and providing barriers to address most of these areas is not feasible either logistically or financially. In addition, barriers installed to prevent prairie dog movement also limit the movement of other animals on the landscape, especially herpetofauna (amphibians and reptiles), small mammals and terrestrial insects. It is preferred to fence prairie dogs out of areas they are not desired, rather than fencing them in, to create fewer impacts on other species. Barriers present opportunities for weed seeds to be captured and established in a concentrated manner along the barrier (threatening adjacent plant communities), and barriers can influence distribution of snow and moisture, thus shifting natural moisture regimes in a localized area. As a result, the location of barriers needs to be carefully considered for unintended consequences. Lastly, barriers are often less than 100% effective. They are a deterrent, not a prevention technique, especially if an underground burrow system exists on both sides of the barrier alignment. Often prairie dog barriers can slow movement of prairie dogs or direct movement away from an area but they require continual maintenance and monitoring. Given this, the extremely large investments in barriers makes redirecting substantial amounts of City funding to this effort unwise. **Staff recommend that limited funds for barriers be used to address conflicts with City land uses including agriculture and parks and that the feasibility of a grant program (funding level to be determined) be investigated to provide a finite amount of barrier cost-sharing for private landowners interested in erecting a barrier on their property adjacent to City properties.** Funds could be granted to those applicants where a barrier is deemed to provide a good level of improvement in the prairie dog movement in the area, where impacts to other natural or agricultural resources is minimal, and where the landowner is likely to be able to maintain their property largely prairie dog free with the help of a barrier.

Proactively address 10% of defined conflict areas annually. (2b)

As discussed in Attachments B3 and B4, the scale of conflict areas at this time is extremely large and changes annually. Taking action to mitigate 10% of this annually is not feasible from a logistics, staffing, or funding perspective. In 2020, OSMP staff are requesting \$226,850 and 0.9 FTE plus temporary staff to address conflict on 5 agricultural properties. Four of these would be addressed through relocation and the fifth through passive relocation and erecting a temporary (fabric or straw) barrier. This work would address 16.8 acres of agricultural conflict areas or approximately 1.5% of the current conflict. This would not include any conflicts with adjacent

landowners, which have not been quantified. **Staff recommend prioritizing conflict areas based on feasibility and degree of conflict and working conflict mitigation into departmental workplans and budget prioritization each year- although given the scale of the issues, and high price of mitigation, this is likely to address far less than 10% of areas in each year.**

Implement sustainable processes that provide resources and capacity to secure prairie dog conservation by:

- establishing a grassland conservation fund that augments operating budgets for meeting prairie dog management and is used for expenditures including but not limited to acquisition, relocations and stewardship;
- working with Boulder's philanthropic community to identify opportunities to provide sustainable support to prairie dog conservation in the Boulder region.

Benefits of implementation:

The City of Boulder's prairie dog management practices reflect the community values of humane treatment of wildlife and limiting disturbance and lethal control when possible. These practices are more costly than traditional prairie dog conflict mitigation and it is prudent to explore sustainable processes that financially support these management practices. Similarly, having an established system to increase transparency of how money is related to prairie dog management is collected, where it is housed, and how it is spent increases community understanding and trust.

Evaluation of implementation options and staff recommendation:

The evaluation of implementing this recommendation requires an assessment of the resources needed to establish and administer a Grassland Conservation Fund with our ability to recover the costs. One element of evaluating cost recovery is estimating how much money would be deposited into a Conservation Fund and how many times we would institute the relocation fee (described in attachment B1). The Grassland Conservation fund is intended to receive donations and fees. As it is difficult to estimate the amount of money that would come into the fund prior to establishing the relocation fee for private landowners relocating prairie dogs to city land. **Staff recommends the Conservation Fund be established in 2021 after the implementation of the relocation fee on a pilot basis for a three-year period and re-evaluated at that time.** The Conservation Fund will be established as an identified project ledger of the General Fund within Planning & Development Sustainability (P&DS) Fund. This would allow tracking and holding place for fee collection and potential donations.

Campaign for more public awareness, engage the public through technology, Boulder newsletters and community outreach programs. Presentations at local libraries, schools, Boy/Girl Scout troops and 4-H groups are ways to reach out to the community; Create surveys to gauge public awareness and concerns based on historical efforts; and Better educate public about plague and update informational sites.

This suite of recommendations that focus on evaluating and increasing public awareness and outreach efforts compliment all the other recommendations and would be valuable additions to

the city's current educational efforts. The city's OSMP department offers prairie dog education programming to school and community groups and includes information about their role in healthy prairie ecosystems and as an example of a keystone species in many programs.

Based on the other priorities identified throughout the memo for 2019 & 2020 staff is recommending deferring these education and assessment recommendations until additional funding or staff resources can be identified.

Attachment B3. Analysis of conflict mitigation opportunities on OSMP agricultural properties

OSMP supports a variety of agricultural activities on its properties. Of these, uses associated with irrigation represent the largest degree of conflict with the presence of prairie dogs. Although prairie dogs may have an impact on grazing lands at high occupation levels, these are seen as a natural consequence of balancing multiple goals in our native grasslands including prescriptive grazing, native wildlife protection and native plant community preservation. On irrigated farmlands, however, the presence of prairie dogs makes irrigation difficult or impossible due to the challenge of flood irrigation with prairie dog mounds and burrow systems. In addition, on many irrigated fields, lush vegetation growth is required to support harvesting of hay, vegetables, or row crops. The presence of prairie dogs and their grazing and clipping activities reduce this growth to a degree that makes harvest of economically viable quantities of crops difficult or impossible. As a result, OSMP considers overlap of irrigated agricultural lands and prairie dog occupation as a conflict.

Across the OSMP system, a number of irrigable properties are not being irrigated. The reasons for this may be directly related to high prairie dog populations, or a lack of agricultural infrastructure in a condition suitable to support agricultural management activities. Because properties with the potential to be irrigated represent the best opportunity for agriculture as defined within the Grassland Ecosystem Management Plan (GMAP) and Agricultural Resource Management Plan, and consumptive uses are required to maintain valuable water rights, OSMP strives to maintain or restore irrigation on these properties. To better understand the conflicts and issues associated with prairie dogs on these properties, OSMP staff completed analysis of conditions on all agricultural properties considered “irrigable”. The full acreage of irrigable properties on OSMP is 6,641 acres.

The scale of overlap of prairie dogs and irrigable agricultural lands changes from year to year. However, over time (since 1996), OSMP has mapped all prairie dogs on OSMP land. When all of these maps are merged, a “maximum extent” of prairie dog occupation is calculated. This is all areas that have been occupied at any time since 1996. The maximum extent overlap of irrigable farmland with prairie dog colonies occurs on 57 properties, over 1,524 acres, or 23% of the total irrigable area. However, some agricultural tenants are more severely impacted by prairie dogs occupying irrigated agricultural lands than others.

In 2018 (most recent annual mapping data), populations over much of the OSMP agricultural landscapes were quite high. Thirty-eight properties contained irrigable lands with agricultural management goals and prairie dogs. Within this, 36 properties contained prairie dog colonies that overlapped with the irrigable portion of the property. On these properties, 1,052 acres overlap irrigable lands where irrigated agriculture is the future management goal for the property. So, the areas of irrigable agricultural land in 2018 impacted by conflicts with prairie dogs is 16% of the total acres of irrigable land on OSMP. However, distribution of prairie dogs is not uniform, and two tenants in the northern part of the OSMP system have prairie dog colonies on nearly 50% of their leased, irrigated lands.

To determine the feasibility of reducing these conflicts, OSMP staff examined each property to determine what management actions might be possible given the management designation of each property. Staff also evaluated what was feasible and likely to be successful at mitigating conflict.

Staff examined the feasibility of using relocation as the primary tool for addressing current conflicts on all irrigable ag lands where relocation is allowed. Eight of the properties are either Grassland Preserves, where the landscape context and level of prairie dog occupation makes removal difficult or impossible (and unlikely to be successful), or Multiple Objective areas, where active relocation would not be used (based on management direction in GMAP). For the remaining properties, the total number of prairie dogs, based on typical densities of prairie dogs is approximately 14,000-20,000 individuals. Given recent relocation costs and receiving site availability, if populations did not grow, relocating these individuals would cost between \$4.8 million- \$7.3 million and require up to 20-30 years to complete. Receiving sites would have to cover between 1400-2000 acres and other grassland health goals on native grasslands require that relocation be used in a measured way to maintain the balance between prairie dog dominated ecosystems in grasslands and communities that do not thrive in the presence of prairie dogs (e.g. tallgrass prairie).

Given all of these factors, relocation is not a viable tool to address the conflicts on all irrigable lands currently experiencing high occupancy of prairie dogs. However, the analysis of property-by-property options allows OSMP to identify and prioritize properties where relocation or other onsite tools (barriers, passive relocation) can make a difference in the near-term.

Of the 36 properties and 1,052 acres where the highest priority conflict exists, 8 properties, with current prairie dog occupancy of 64 acres were identified as likely to be addressed through active relocation to Southern Grasslands. Given current population levels and typical densities, these properties likely contain between approximately 1,280 and 1,920 prairie dogs. In order to relocate this many prairie dogs, based on prices from previous relocations, it would cost between \$448,000 and \$672,000 and require approximately 130-192 acres of receiving sites. Relocation projects are logistically complicated, and the number of humane relocators that will do this type of work is limited. Based on past relocations, a reasonable number of prairie dogs to relocate in a single year is 400-700. The logistics, costs, time and contractor availability associated with relocations makes it difficult to support a larger scale relocation in most years. As a result, based on a typical size of feasible relocation for a single year, current populations on these 8 properties (assuming no further growth) will require approximately 3 years to relocate. This seems to be a feasible path to follow for the next few years if conditions persist as they are. **As a result, staff recommend continuing to do relocations each year as feasible- based on receiving site availability, conditions on conflict areas, and prioritization as discussed in Attachment B3 and the overall citywide prioritization criteria created by the PDWG.** Funding and staffing for these relocations will be incorporated into OSMP CIP budgets and work planning over the next several years.

Another four properties and 46 acres are likely to be addressed through onsite mitigation, likely passive relocation (onsite relocation out of a portion of the colony that overlaps irrigation onto the portion that does not) and barrier construction, combined with maintaining or increasing

irrigation to exclude the prairie dogs. Staff intend to begin work on the first of these properties in 2020, and funding is included in the draft OSMP CIP for that year.

Although management will be undertaken to reduce conflict on these 12 properties (~10% of the conflict areas) over the next 3-4 years, due to high occupancy at this time, the other 19 properties and 734 acres were identified as not having feasible short-term conflict reduction options. For these properties, it is most feasible to address conflict at a future time when populations are lower than they are currently (likely due to epizootic plague reducing populations). Through time, sylvatic plague has moved through populations of prairie dogs on OSMP, reducing populations substantially and rapidly on most colonies. After one of these episodes (or epizootics), populations are low, relocation or other methods of removal or exclusion become far more feasible. We anticipate that this will continue to happen (although timing is unpredictable).

Plans for properties where no feasible or effective options exist now include what to do in the event of plague including potential relocation of remaining animals, and efforts to exclude future prairie dog occupation through the use of a variety of tools (barriers, enhanced irrigation, etc). The tools that are most appropriate for each property will vary, so site specific plans will need to be prepared to be able to respond in the event that plague does occur.

Creating plans for each property on OSMP will require evaluation and planning work by the OSMP agricultural and wildlife groups. Due to plans for relocation and other mitigation in 2020, staff will include staffing beginning in the 2021 budget to tackle creating property-by-property plans for those conflict areas where post-plague exclusion is the best option.

In the meantime, OSMP ag and water staff is actively managing and conducting irrigation infrastructure assessments and improvements on 215 acres of unleased, irrigable lands. Staff hopes to maintain or improve vegetation conditions and improve the irrigation systems so that these properties can rapidly improve in the event there is a prairie dog population decline. This work is being funded within existing budgets. Staff is also experimenting with soil building practices and cover crop seeding mixes and techniques as part of a carbon farming project. Staff believes that these practices have potential to be scaled up and implemented as part of a strategy to return formerly irrigated lands to production. Increased budget request for this work will be included in upcoming budget requests.

Beginning in 2020 and upcoming years, OSMP is including budget requests as part of CIP funding requests for resources to address properties where the analysis showed that relocation or onsite mitigation (passive relocation + barrier) is likely to provide an improvement in the situation, and to create plans for other properties to be implemented after plague. In 2020, OSMP is requesting \$226,850 and 0.9 FTE and temporary staff to address 5 properties (4 through relocation and 1 through passive relocation and a temporary barrier) totaling 16.77 acres. Making measurable progress on these priorities is likely to require at least this much funding and staffing each year for the next 3-4 years. These needs will be included in departmental workplan and budget prioritization to determine what is feasible each year.

Attachment B4. Discussion of neighbor conflict mitigation- scale and options

City of Boulder properties exist in a patchwork of land ownership within Boulder County. Many of our properties share boundaries with other land management agencies (Boulder County especially) or private landowners. These adjacent landowners may find prairie dog occupation inconsistent with their goals for the management of their property. These conflicts may be centered around existing uses such as agricultural uses for hay production or livestock grazing, or other priorities like landscaping or high vegetative cover. Still others do not desire prairie dogs on their property due to concerns for pets or children interacting with prairie dogs and their burrows. Some neighboring properties have large prairie dog areas; however, some are small but potentially increasing. Focusing on these smaller areas where opportunities for resolution are highest is likely to produce the best results.

The full scale of neighbor conflict with prairie dogs is unknown. However, we have spoken with several neighbors over the last several years who feel that prairie dogs on their property are a result of prairie dog occupation on the adjacent open space and would like to find ways to keep prairie dogs off of their property. Offers to collaborate with the landowners on barrier installation at their cost and explanations of the limitations on the city's ability to manage wildlife that move across the landscape and are not the property of the city have not sufficed. Mitigation of this type of conflict is difficult. In the absence of plans to relocate prairie dogs off the adjacent open space, the only feasible options are to install physical or visual barriers or lethal control. Although a variety of barrier options exist (vegetative, various fencing materials), all options are expensive. Barriers only serve as a deterrent, not a preventative, especially if existing burrow structure is evident on both sides of a barrier. Sites with barriers and buffers require continual monitoring, maintenance and passive relocation. Over the last 2 years, staff has had conversations with neighbors of 22 OSMP properties who requested that the city do something to mitigate the conflict they were experiencing on their property. The cost to install metal barriers (most effective option with lowest need for ongoing maintenance) to help mitigate these conflicts would be approximately \$2.2 million (11.8 miles of interface x \$35/linear foot). In addition, substantial staff time would be required to design and support barrier installation on that scale. Less expensive options could be investigated, but costs would still likely exceed \$1 million and would be less effective and require additional maintenance in the long-term.

Parks and Recreation identified seven natural areas with known or potential neighbor conflicts and nine park areas with existing conflict not fully mitigated. Historically, P&R has offered to collaborate with those neighbors on installation of barrier on their property, but at their cost. If these areas were to have the typical barrier installed it would be approximately \$673,400 for 3.64 miles of barrier for private neighbors and an additional \$246,750 for 1.34 miles of barrier within the parks system to address remaining issues. Some of these other park area conflicts include the Boulder Reservoir dam faces where prairie dogs are not legally allowed to be in the buffers but have expanded around existing barrier infrastructure.

In addition to being expensive, barrier fencing has visual impacts on the landscape and potential impacts to other wildlife and plant communities. Barrier fencing is intended to be a physical barrier to prairie dog movement across the selected boundary. This physical barrier would also block or substantially modify movement of other wildlife. Barrier fencing might also create

issues with weed seed capture and invasion of disturbed areas along the barrier and modify snow movement and collection on the landscape, resulting in changes to localized moisture regimes that might impact native plant communities.

Due to the large extent of potential conflict, and large expense of addressing any meaningful portion of these conflicts with metal barriers, staff will explore other options. These may include less costly mitigation options on some sites and investigating establishing a cost-sharing grant program that could provide some funding to adjacent landowners planning to install a barrier. The level of grant funding could be determined through departmental budget prioritization.

Attachment B5. Relocation update and opportunities on Open Space and Mountain Parks

Relocation receiving sites as defined in the Grassland Ecosystem Management Plan (GMAP) on OSMP may reside in either Prairie Dog Conservation Areas or Grassland Preserves. Currently high occupation levels in the North and East Grassland Preserve and many Prairie Dog Conservation Areas make these unavailable at this time to serve as receiving sites. As a result, receiving site availability is focused in the Southern Grasslands and a few Prairie Dog Conservation Areas in the Southern portion of the OSMP system. In 2018 (most recent mapping), occupation of the Southern Grasslands was 74 acres or 1.8% of the total area of the Grassland Preserve. The Grassland Ecosystem Management Plan outlines conditions under which prairie dogs would be relocated to Grassland Preserves including criteria related to vegetative condition, and overall occupancy of the area. Based on these criteria, OSMP would relocate up to 10% occupancy. This means that another 337 acres could be used for relocation to satisfy the prairie dog occupation relocation criteria. In the PCAs, occupancy is 338 acres, which leave an additional 269 acres designated as PCAs that are unoccupied. As a result, a total of 606 acres could qualify for relocation on OSMP based solely on occupation.

Although 606 acres could qualify, there are a number of limitations that reduce the number of acres available each year- these are:

Grassland Preserve

- Many colonies do not yet meet vegetation recovery criteria, especially where prairie dog occupation was long-term and at high densities
- Several colonies support nesting burrowing owls which are easily disturbed and nest during the relocation season
- Some colonies are inaccessible to equipment due to topography, streams and ditches (preventing infrastructure for relocation from being installed)
- Some colonies have experienced sylvatic plague recently, making permitting difficult, and survival of relocated animals and relocators safety problematic

Prairie Dog Conservation Areas

- Potential for surrounding neighbors to object to a planned relocation (as happened at Richardson II in 2011, preventing the City from obtaining a State permit to relocate to the colony) requires advanced outreach and work with neighbors to ensure successful state permitting

In 2019, staff have not begun initiating work on any PCAs in advance of seeking permits for relocation due to other workplan priorities and the extent of work required for the analysis and implementation of the Prairie Dog Working Group Recommendations. In future years, this will be included in workplans as feasible to attempt to utilize one or more PCAs for relocated prairie dogs.

In the Southern Grasslands, the Damyanovich colony (which has been used the last 3 years for relocations) has space to receive an additional 100 prairie dogs that were not relocated in 2018

due to timing issues. In addition, the Salstrand colony qualifies based on vegetation recovery and other factors to receive prairie dogs. Salstrand is approximately 177 acres, with a small area of active prairie dog occupation, allowing it to receive around 1500 prairie dogs. 2019 plans for relocations include finishing relocations off the Nu West North colony to Damyanovich, and moving prairie dogs from a number of other priority OSMP agricultural sites (Nu West East, Nu West, Teller Middle and Hester) to the Salstrand site.

Why aren't more acres available

Staff are often asked why prairie dogs cannot be relocated to much larger areas of OSMP given over 25,000 acres of land in the Grassland Planning area. The total area included in the Grassland Plan includes a variety of land uses and community types and discussing the whole as prairie dog habitat is misleading.

Of the 5970 acres of potential prairie dog habitat, additional areas will not be suitable due to shrub cover, high levels of disturbance (e.g. Varra pit) or other factors not considered in the analysis. This analysis is not intended to be a fine scale habitat suitability model, but just to show at a system-wide level that the grassland planning area is made up of a variety of habitats and landscape features, some of which are conducive to supporting prairie dogs and some of which is not. Looking at the Southern Grasslands, prairie dogs have been seen to focus on specific soil types, avoiding the soils that have higher rocky content, which are common near the Rocky Flats mesas. As a result, occupation of Southern Grasslands would likely never be as high as other areas, even in the absence of any type of control or plague.

In addition, the Southern Grasslands are home to a variety of important plant and wildlife communities. Prairie dogs and their associated species are one of these important communities and make up a prominent part of the mosaic within this large grassland habitat block at times of high occupation. However, the Southern Grasslands are also home to communities and species that do not persist with long-term prairie dog occupation, burrowing and grazing. Examples of this are big bluestem tallgrass prairie and xeric tallgrass prairie. These plant communities support species such as the grasshopper sparrow- a species of conservation concern showing continental scale declines which require tall stature vegetation for successful nesting. In addition, a number of very rare and declining butterflies and skippers rely on big and little bluestem grasses on the Southern Grasslands to support their larval development. In areas with prairie dog occupation, these species cannot be successful through all of their life stages. As a result, prairie dogs play an important, and in places dominant, role in the mosaic of community types within Southern Grasslands. However, in order to conserve the full suite of diversity in the area, prairie dog occupation at levels seen in the past (16%) which fall within Grassland Plan goals and objectives serve to protect all aspects of the Southern Grasslands diversity.

What is the relationship between relocation need and receiving site availability?

In 2018, approximately 1052 acres of irrigated fields are occupied by prairie dogs. These are considered to be the highest level of conflict between prairie dogs and other management objectives on OSMP. To accommodate most of these prairie dogs that sit on sites where relocation could be used, approximately 1400-2000 acres of receiving sites (assuming typical

densities on the sending sites) and installation of approximately 1400-2000 artificial nest boxes would be required. In addition, to move all of these prairie dogs would cost between \$4.9 million and \$7.3 million dollars and based on current staff capacity to support relocation and current availability of skilled contractors, accomplishing these relocations would take between 20-30 years. Other demands on relocation exist, including private development sites and other city property, including site evaluated in the Urban Wildlife Management Plan Prairie Dog Component (e.g. Valmont Park).

Due to the overwhelming nature of the conflict due to the high occupation in the North, relocation will continue to be used to address conflicts where it can be done in a feasible and effective way. It will not, however, offer a useful tool on most sites at current occupation levels.

Plans to move approximately 1280-1900 prairie dogs off of 64 acres of irrigated fields will be completed over the next 3-4 years. These relocation needs are anticipated to be accommodated by currently available receiving sites. If occupancy drops in the future, relocation of far smaller populations of prairie dogs off many of these sites may prove far more successful. Additional detail on analysis is included in Attachment B3.

Attachment B6. Draft Integrated Pest Management Policy

CITY OF BOULDER * POLICIES AND PROCEDURES**

INTEGRATED PEST MANAGEMENT POLICY

EFFECTIVE DATE: X, 2019

Jane S. Brautigam, City Manager

I. SCOPE AND APPLICATION

- This Integrated Pest Management (IPM) policy applies to all pest management activities conducted by all city staff, contractors and lessees, which includes all monitoring, non-chemical pest management practices and any pesticide use in buildings and related facilities; grounds and open space; and other property owned or managed by the City of Boulder, including property outside city limits.

II. PURPOSE

The purpose of this policy is to provide guidelines for implementation of the most environmentally-sound approaches for landscape, natural area, agricultural and facilities management and to reduce and eliminate, where possible, the volume and toxicity of chemical pest control treatments. The overarching goal is for all city IPM practices to be carefully assessed for the potential impacts to human health, water quality, non-target organisms, and the preservation and/or enhancement of biodiversity, particularly federal endangered and threatened species, and state, county and local species of concern. As a result, ecologically-based IPM approaches will be developed that promote the stability of desirable species and discourage pest populations, while sustaining the natural balances within the ecosystem.

III. DEFINITIONS

A. Integrated Pest Management (IPM): a decision-making process that selects, integrates, and implements a combination of suitable and compatible strategies to prevent, deter, or manage pest populations within established thresholds. IPM uses a "whole systems approach," viewing the target species as it relates to the entire ecosystem. Management strategies are chosen that minimize impacts to human health, the environment, and non-target organisms, and protect overall biodiversity and ecosystem health.

B. Pest: broadly, a pest is an organism that interferes with or reduces the availability or quality of desirable plants and other resources; impacts human or animal health; damages structures; or harms some component of the ecosystem. Whether or not an organism is considered a pest can depend on the setting, rather than the particular species. A pest may be an insect, rodent, nematode, fungus, weed, or any other form of terrestrial or aquatic plant or animal life or virus, bacteria, or other micro-organism (except viruses, bacteria, or other micro-organisms on or in living man or other living animals).

C. Pesticide: any substance or mixture of substances intended for killing or repelling any pest. This includes without limitation fungicides, insecticides, nematicides, herbicides, and rodenticides and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. In addition to applications of pesticides, products that have been pre-treated with pesticides are subject to this policy. Plants that have been genetically modified to incorporate pesticides or are resistant to pesticides are prohibited unless an exception has been granted by the city manager.

The following products are not pesticides:

1. Deodorizers, bleaching agents, disinfectants and substances for which no pesticidal claim is made in the sale or distribution thereof, and
2. Fertilizers and plant nutrients.

• **D. Reasonable Alternative:** a feasible option for pest management, which takes into account the short and long-term economic, social, and environmental costs and benefits of the proposed choices.

IV. CITY IPM COORDINATOR

The city manager has determined that a central staff person will coordinate the IPM efforts of city departments. The IPM coordinator's responsibilities include, but are not limited to the following:

- Coordination with city departments on weed and pest management issues and integrating IPM principles with other environmental policies and plans;
- Publication of IPM reports;
- Coordination of an interdepartmental IPM team;
- Development of a city weed management plan, in compliance with state law;

- Development and maintenance of pesticide approval process(es) and pesticide reduction and usage guidelines;
- Coordination of the development and update of an IPM operations manual;
- Research and recommendations for IPM strategies;
- Development and administration of the city's mosquito management policy and program;
- Assistance to city departments with staff training needs; and
- Outreach to residents regarding IPM, pollution prevention and pesticide reduction strategies, pollinator protection and natural lawn and gardening practices.

A. IPM Reports. The city IPM coordinator will compile the data from all participating city departments from the information listed in Section V, Departmental/Divisional Obligations. This information will be provided in reports and/or posted on the city's website. Comprehensive reports will be submitted to the city manager and city council and will include IPM-related data, a review of new IPM strategies, and arising challenges, IPM program or departmental accomplishments, and IPM program coordination with other city programs and initiatives.

B. Interdepartmental IPM Team. This team will be coordinated by the city IPM coordinator and will include department IPM coordinators, managers and other key city staff. The team will meet at least quarterly and meetings will include development of city IPM goals and strategies, review and evaluation of the IPM operations manual, as well as opportunities for information exchange, education and collaboration. This team will also review interdepartmental issues and make policy recommendations that advance the objectives of the IPM policy and reduce reliance on chemical pest control.

V. DEPARTMENTAL/DIVISIONAL OBLIGATIONS

All departments/divisions that conduct pest management operations and/or use or potentially use pesticides are required to fulfill the obligations of this section.

A. IPM Operations Manual. The IPM operations manual (manual) will serve as a guide for all pest management operations and will provide rationale and procedural guidelines for the implementation of the IPM policy. All persons conducting pest management within the scope of this policy are required to follow the manual. Departments or divisions will provide information to the city IPM coordinator and the IPM interdepartmental team to contribute towards the creation, review and update of the manual. The manual will be reviewed annually, and a record kept of any revisions. Departments will designate at least one staff member as the departmental/divisional representative who will be responsible for providing information and input concerning the manual.

B. Record-keeping and Evaluation. Each department, division or work group must keep accurate records and results of all IPM treatments. Information on all treatments (including non-chemical) will include how, when, where and why the treatment was applied and the name of the applicator. This information will be compiled for IPM reports. The city IPM coordinator will review pest management strategies with city departments and the IPM interdepartmental team to evaluate results, share information with other staff and improve the IPM program.

Application records will be made available to the public upon request in accordance with all applicable state laws governing public access to information.

C. Contractor Notification. Every department bidding out contractual work for pest management must inform all bidders about the requirements of the IPM policy and incorporate its guidelines in bid specifics.

If pesticides are applied, only those products may be used that are part of the approved pesticide list and adhere to its use guidelines

OR

are in accordance with a pesticide assessment and selection process approved by the city manager in compliance with the protocols and guidance of the IPM operations manual and/or are reviewed and have prior approval by the department and its division representative and the city's IPM coordinator.

- The city will inform pest management contractors of the city's IPM Policy and operations manual and provide a written copy of this policy and other relevant documents as appropriate. Project managers, departmental IPM representatives, or the city IPM coordinator must approve all pest management treatments.

VI. IPM PROCEDURE

The city assumes that all pesticides are *potentially* hazardous to human and environmental health and will take measures to avoid any non-essential use. Therefore, reasonable non-pesticide alternatives will be given preference over chemical application by following the IPM procedure. City staff will evaluate alternatives to chemical treatments, including the cost-effectiveness of the treatments. For all pest control activities, the IPM procedure outlined below must be followed.

A. Initial Data Collection, Mapping and Monitoring. Each department or division considering management of a target species should first collect baseline data on the pest ecosystem(s) to determine if the organism is truly a pest that warrants treatment. This data includes the pest population(s) occurrence, size, density and presence of any natural enemy population(s); gather information on pest biology and site ecology, and different control techniques available; and document sensitive areas and conditions that may limit control options. Data should be collected in a standardized manner that is repeatable.

For structural pests, inspection and monitoring should be conducted to determine and eliminate route of entry, potential food and water sources, and nesting sites. This information should be logged.

Ranking, inventory, mapping, monitoring and evaluation are methods used for determining pest management priorities. Maps and inventories depict infestations in terms of pest species, size, location and threats to resources. Departments/divisions must monitor infestations or pest populations and evaluate treatments over time to assess the effectiveness of various treatment strategies and their effects on target and non-target organisms, the overall biodiversity of each site and the desired management objectives. These objectives should be reevaluated over time as the range and distribution of different species is altered from climate change and other anthropogenic factors

All monitoring methods and data must be specified in departmental or divisional IPM procedures and included in the IPM operations manual, systematically recorded, and available for review. Departments should coordinate and utilize standardized mapping and data recording protocols, if possible.

B. Establishing Threshold Levels. To determine if treatment is warranted, an acceptable threshold level of treatment for each target species and site should be established based on the ecology of the pest and either its *density* that creates environmental, aesthetic or economic damage or based on a measurement of the *damage* resulting from the pest. Departmental IPM procedures will include the threshold levels for common pests, determined by individual work groups, and may be developed in consultation with the city IPM coordinator and interdepartmental team. In some cases, a threshold, such as eradication, suppression, or containment may be required by federal or state law.

C. Management Selection Criteria. Upon determining that management for an undesirable species is necessary, the following criteria should be used to help select the appropriate IPM treatment strategy:

1. Least-disruptive of naturally occurring controls;
2. Least-hazardous to human health;
3. Least-toxic to non-target organisms;
4. Least-damaging to the general environment, surface and ground water, and overall ecosystem function and stability;
5. Most likely to produce a permanent reduction in the environment's ability to support target pests; and
6. Economic and environmental cost-effectiveness in the short- and long-term.

D. Management Strategies and the IPM Hierarchy. Each department or division, in consultation with the city IPM coordinator, IPM team and/or guidelines of the operations manual, will make its own determination about appropriate and effective management approaches, based on site-specific requirements and conditions. Commitment to the most environmentally-sound approach is expected, relying primarily on non-chemical methods.

Prevention, cultural control, mechanical control, biological control and chemical control are the techniques used in the hierarchy of integrated pest management. In general, a combination of compatible treatments is more effective than a single approach. Department and division staff are encouraged to seek out and experiment with innovative IPM treatments (and combinations of treatments) and share this information at the interdepartmental IPM team meetings. The following treatments are listed in the order in which they should be executed:

1. Prevention. This is the most effective and important pest management strategy and is the foundation of IPM. By reducing the capacity of the ecosystem to support target pest populations through design and appropriate management, the opportunities for pest establishment can be reduced to tolerable thresholds or eliminated. Some examples are:

- a) Strategies that reduce the preferred harborage, food, water or other essential requirements of pests;
- b) Promoting healthy soils and ecosystems to withstand pest infestations;
- c) Weed-free materials and equipment for road and trail construction and maintenance.
- d) Landscape and structural design that is appropriate to the specific habitat, climate and maintenance the area will receive; and
- e) Project design that considers the potential impacts of pests and mitigates through the use of appropriate landscape design (plant choice, soil preparation, water requirements, weed barriers, etc.).

2. Cultural. Cultural control is the use of management activities that can prevent pests from developing or keep them below tolerable levels by enhancement of desired conditions.

Examples include:

- a) Selection and placement of materials that provide life support mechanisms for pest enemies and competitors;
- b) Modification of pest habitat by reducing pest harborage, food supply and other life support requirements;
- c) Vegetation management including irrigation, mulching, fertilization, aeration, mowing height, seeding, pruning and thinning;
- d) Waste management and proper food storage;
- e) Barriers and traps;
- f) Heat, cold, humidity, desiccation or light applied to affected regions; and
- g) Prescribed burning or grazing.

3. Mechanical. Mechanical control is accomplished by using physical methods or mechanical equipment to control pest infestations, such as:

- a) Mowing or weed-whipping;
- b) Prescribed burning;
- c) Hand-pulling of weeds;
- d) Hand-removal of pests (e.g. insect or invasive amphibian egg masses).

4. Biological. Biological controls include the introduction or enhancement of natural enemy populations to target pests. Introduction of non-indigenous organisms has an associated risk factor and should be thoroughly evaluated prior to implementation in consultation with the city IPM coordinator and the interdepartmental IPM team. Biological methods include:

- a) Conservation and augmentation of the pest's natural enemies; and
- b) Introduction of host-specific enemy organisms.

5. Chemical. Chemical control of pests is accomplished by using chemical compounds registered as pesticides. All pesticides are assumed to be *potentially* hazardous to human and/or environmental health.

The type, methods and timing of any chemical treatment will be determined **after** consideration has been given to protection of non-target organisms (including threatened or endangered species), the impact on biodiversity, protection of water quality, pest biology, soil types, anticipated adverse weather (winds, precipitation, etc.) and temperature. Only those pesticides that have been evaluated and approved for use on city properties by a process approved by the city manager may be applied. Application of any pesticide must follow specific guidelines for that particular product, which will be provided to staff, contractors or lessees and include information pertaining to target pests, application methods and any other restrictions.

All pesticides must be applied in conformance with label specifications and all applicable federal, state and municipal laws, regulations and ordinances, as well as any additional restrictions provided in city guidance documents.

All pesticide applications must comply with the appropriate pre and post-notification requirements, according to the City of Boulder's Pesticide Ordinance (Section 6-10-1 B.R.C. 1981). For all city pesticide applications, notification will be posted at the site at least 24 hours in advance, remain on site for at least 24 hours, and posted on the city's hotline. This includes soil and trunk injections, spot spraying, hand-wicking and broadcast spraying on all city lands or property.

E. Education. Education is a critical component of an IPM program. The city IPM coordinator will include IPM information on the city's website. Information will include IPM reports, the IPM operations manual and pesticide assessment processes, recommendations for the most ecologically-sound pest management for residents, and IPM-related events and educational opportunities across the city.

VII. CONTRACTOR REQUIREMENTS

The City periodically enters into contracts that authorize pest management, such as building maintenance, project construction and maintenance, and weed and insect control. When the city signs a new contract or extends the term of an existing contract with a contractor that conducts IPM-related work, including the application of pesticides, the department must ensure that it complies with existing IPM guidelines or consult with the city IPM coordinator to develop procedures that comply with the IPM policy.

- The contractors must comply with appropriate pre and post-notification requirements, according to the City of Boulder's Pesticide Ordinance (Section 6-10-1 B.R.C. 1981) and relevant internal city protocols, such as providing timely information to post the application on the city's pesticide hotline.

VIII. CONSTRUCTION AND INTERPRETATION

- Employees who have questions concerning possible conflict between their interests and those of the city, or the interpretation and application of any of these rules, should direct their inquiries to their department director. The department director may refer the matter to the city manager for final resolution.

IX. EXCEPTIONS/CHANGE

- This policy supersedes all previous policies covering the same or similar topics. Any exception to this policy may be granted only by the city manager. This policy may be reviewed and changed at any time.

Adopted 1993, updated X 2019.

Attachment C. Board Feedback

Environmental Advisory Board (Meeting Date May 1, 2019)

Feedback will be provided after the meeting is held

Parks and Recreation Advisory Board (Meeting Date April 22, 2019)

The Board supported staff's recommendation for the phased approach to implementation of the PDWG Phase II recommendations.

PRAB expressed two additional concerns. First, PRAB suggested that members of the PDWG be given the opportunity to review and provide feedback on staff's recommended implementation plan. Second, PRAB expressed concern regarding the OSBT recommendation to reprioritize the relocation of prairie dogs from OSMP irrigated agricultural lands above all other city projects. The concern from PRAB is because of the imminent need to relocate prairie dogs from the site of the future Valmont City Park for planned development. Should the priority of relocation sending sites shift, precluding the current planned relocation of prairie dogs from Valmont City Park in 2020, major delays in funding and timing of that community priority would result. There should be a city-wide discussion about the priority of which prairie dogs are relocated and when, if the current system is to be changed.

Open Space Board of Trustees (Meeting Date April 10, 2019)

The board issued the following statement:

The Open Space Board of Trustees (OSBT) supports the protection and preservation of high quality, ecologically viable native grassland ecosystems using management and restoration to achieve the long-term health and biodiversity of the natural communities that characterize the Boulder Valley. To achieve this end, we focus on the varied and complex components of the natural communities rather than management of single species. Further, OSBT supports protecting and wisely using the City's historic water rights on Open Space and Mountain Parks (OSMP) lands to preserve water resources and agricultural production as defined in the City Charter.

The OSBT passed 4 motions:

1. OSBT supports the OSMP staff recommendations in the April 10, 2019, Memo to the OSBT, "Prairie Dog Working Group (PDWG) Phase II Recommendation Update with Staff Analysis, Phasing and Preliminary Implications of Implementation", and recommends to City Council the following:
 - a. Phased implementation of the PDWG Phase II recommendations including modifying the scale and timing of specific recommendations and deferring selected Phase II recommendations.

- b. The schedule for a comprehensive review and update of the Grassland Ecosystem Management Plan will be detailed through the implementation of the OSMP Master Plan.
- 2. The Open Space Board of Trustees (OSBT) recommends to City Council in order to meet City Charter purposes on lands designated for agricultural production, the following amendment to the priorities for relocating black-tailed prairie dogs proposed in the 2017 Prairie Dog Working Group Phase I report presented to and accepted by the City Manager in 2018:

The city's first and highest priority will be the relocation of prairie dogs from any Open Space and Mountain Parks (OSMP) irrigated agricultural lease-holdings on which prairie dog occupancy exceeds 35% to OSMP receiving sites identified in the Grassland Ecosystem Management Plan.

When 35% occupancy on irrigated agricultural lease-holdings is no longer exceeded and ecological conditions and relocation requirements as defined in the Grassland Ecosystem Management Plan are met and determined to be feasible by OSMP, relocations from OSMP lands causing conflicts with adjoining private lands, and from other City properties or privately-owned lands, will be considered.

Relocation is contingent upon the evaluation of the capacity of identified sites on OSMP lands to receive additional prairie dogs. When OSMP determines that identified receiving sites are "full" or at capacity no additional prairie dog relocations will be accepted in order to maintain the ecological condition of the land and the health of the prairie dog colonies. Andria Bilich seconded. This motion passed unanimously.

- 3. Prairie dog levels on numerous Open Space and Mountain Parks (OSMP) irrigated agricultural properties have created a conflict between the city prairie dog and agricultural policies, and prevent OSMP from fully meeting Charter purposes. It is infeasible to address these problems only by non-lethal means in a timely fashion. Accordingly, we recommend commencing an expedited OSMP-led process, with appropriate outreach, to evaluate whether, where, and how to use lethal control to address these problems. Curt Brown seconded. This motion passed unanimously.
 - 4. The Open Space Board of Trustees (OSBT) recommends to City Council that addressing the prairie dog crisis in an expedited fashion requires a request for a supplemental budget allocation to Open Space and Mountain Parks (OSMP) for the next 3-4 years, and that a sufficient program requires the hiring of an additional FTE to coordinate all OSMP prairie dog management and conservation activities.

Attachment D (Figure 1): Prairie Dog Working Group Recommendations and Categorization for Implementation

Milestone Description	<p align="center">Bucket</p> <p>1= Existing staff, existing resources, consistent with plans/policies</p> <p>2= Additional staff or additional resources, consistent with plans, policies (2a- short term; 2b - longer term or dependent on completion of another milestone first)</p> <p>3= Existing staff, existing resources, not consistent with existing plans or policies</p> <p>4= Additional staff, additional resources, not consistent with existing plans and policies, may have significant trade-offs or reprioritization implications</p>
Prior to implementing the plan under Milestone 2, all translocated prairie dogs will receive plague abatement.	1
By 2019, work with Integrated Pest Management (IPM) to ensure implementation of an acceptable policy that may limit the use of insecticides but allows such use on large prairie dog ecosystem colonies as necessary.	1
Recruit researchers from USGS, CSU, etc. to secure funding and implement a research plan.	1
Land Developers: Follow newly proposed protocol for relocations.	1
Communication & Protocols: Have clear and consistent communication among all agencies.	1
Communication & Protocols: Review protocols and update as necessary.	1
Establish who to call when conflicts with illegal activity arise and when animal control cannot be reached.	1

Lobby neighboring county commissioners and state legislators to advocate for these adjustments, providing protocols and language for legislation.	1
No less frequently than once, but no more frequently than twice a year, there will be a publicly-noticed meeting that includes invitations to members of the PDWG with an opportunity for the members to discuss progress on the ecological, social, and economic goals and strategies and contribute to the adaptive management process.	1
Recommend departmental operating budget line items for prairie dog management in the 2020 budget.	1
In the near term, due to high occupancy of conflict areas, there is an increase in the number of successful translocations across the Boulder region.	2a
Pilot by 2021 one property that has prairie dog colonies with managed buffer zones.	2a
By 2020 complete policy review and initiate processes for policy amendments.	2a
By 2019 identify and map conflict areas annually and make it easily available to the public.	2a
Agriculture (leased/private): Evaluate/Provide barriers or other exclusion/mitigation methods.	2a
Create surveys to gauge public awareness and concerns based on historical efforts.	2a

Campaign for more public awareness, engage the public through technology, Boulder newsletters and community outreach programs. Presentations at local libraries, schools, Boy/Girl Scout troops and 4-H groups are ways to reach out to the community.	2a
Provide Boulder residents opportunities to contribute to PD conservation through assistance with environmental monitoring and outreach programs.	2a
Better educate public about plague and update informational sites.	2a
Reevaluation of adaptive management practices.	2a
By 2019, create and implement a required fee structure for private landowners relocating prairie dogs to city land.	2a
By 2020, work with conservation entities to identify conservation practices, programs and funding mechanisms that could support grassland restoration and the mitigation of conflicts on agricultural land. (Example entities include Natural Resource Conservation Service and Great Outdoors Colorado. An example of funding which could be explored includes conservation leases.)	2a
Annually ensure each relevant department has sufficient budgets, staffing and/or consultants to meet the prairie dog management goals and objectives.	2a
By 2019, create a pilot project with at least two outside organizations to help fulfill the PDWG goals and objectives by maximizing in-kind contributions (i.e., donation of nest boxes or fence/barrier materials or installation).	2a

By 2019, pilot application of a habitat quantification tool with parcels being proposed for new acquisitions or easements related to prairie dog conservation.	2b
Based on identified prairie dog occupied and relocation sites, update inventory and monitoring data for at-risk species associated with the Mixed grass prairie mosaic and xeric tallgrass prairie.	2b
Document relative compatibilities of relevant land use and management options applicable to prairie dog relocation sites and occupied colonies (e.g., use of insecticides relative to rare insect species, density of prairie dogs relative to rare plant species).	2b
Private and adjacent land owners: Evaluate/Provide barriers on City of Boulder land adjoining high-conflict areas.	2b
Relocation demands exceed Receiving site: Collaborate with community partners (ex: Prairie Dog Coalition or Defenders of Wildlife) to implement conflict prevention strategy	2b
By end of 2019, initiate a pilot program to implement a conflict prevention strategy in at least two adjoining conflict locations (properties that are next to or connected to each other).	2b
By 2022 proactively address 10% of defined conflict areas annually.	2b
By 2020, pilot the use of the adapted habitat quantification tool developed to determine Net Positive Impact in one or more scenarios within the city.	2b

Work with Boulder's philanthropic community (e.g., Community Foundation of Boulder County) to identify opportunities to provide sustainable support to Prairie Dog conservation in the Boulder region.	2b
By December 2019 staff will provide an annual report on the inflows and outflows.	2b
By 2019 staff will provide their respective department board or commission with annual updates on the status of the goals and objectives as well as a review of, and advisement on, inflows and outflows of the grasslands conservation fund.	2b
Track in-kind contributions on an annual basis and make data available for other funding opportunities.	2b
By 2019, complete and implement a plague-management and monitoring plan using proven-effective state-of-the-art plague management techniques to secure sustainable and plague-resistant prairie dog colonies.	3
Private and adjacent land owners: Add additional criteria to definition of future PCAs in the Grassland Management Plan to consider the level of conflict with adjoining properties	3
By 2019, work with local experts to review modeling method and data inputs to provide an updated prairie dog habitat suitability model and GMAP target viability criteria to map current conditions for the mixed grass prairie mosaic and prairie dog colonies across the relevant grassland landscape to serve as guidance for plan updates.	4

By 2019, based on milestone 1, work with local experts to update and implement GMAP goals relevant to prairie dogs along with receiving site location criteria (I-1) to fully utilize existing grassland receiving sites and to allow additional qualified grassland receiving sites.	4
By 2020, work with adjacent landowners, including the County of Boulder and adjacent counties, US Fish & Wildlife Service, other federal partners, and private landowners in the Grassland Preserves to create and implement a black-footed ferret recovery plan for the southern Boulder Region.	4
Relocation demands exceed Receiving site: Explore additional opportunities for relocations in Southern Grasslands by evaluating current relocation criteria, in conjunction with Goal 1 efforts, to alleviate conflicts in other areas.	4

Goal/Objective/Strategy/Milestone	Category	Memo Attachment	Summary Status/Proposed Initiation	OSMP Implications	Planning Implications	PR Implications
Ecological Goal: Update and implement the City's prairie dog management plans to ensure the creation and maintenance of one or more large prairie dog-occupied ecosystem area that will secure viable plague-resistant prairie dog populations and high-integrity grassland habitat.						
Objective 1: In collaboration with county, federal, and private partners, secure one or more interconnected networks of high-integrity grasslands containing viable populations of plague-resistant prairie dog colonies naturally limited by native predators.						
Strategy 1: Collaborate with county federal, and private partners to prioritize acquisitions, easements, and management agreements to consolidate prairie dog grassland parcels, and as feasible, secure connectivity and linkages among colonies.						
Milestone 1: By 2019, pilot application of a habitat quantification tool with parcels being proposed for new acquisitions or easements related to prairie dog conservation.	2b	Attachment B2	Deferred	Yes	No	No
Strategy 2: Amend prairie dog-related components of the Grassland Management Plan by considering the entire grassland-dominated landscape in the Boulder Region, and implement the updated plan with an aim to increase the number of receiving sites for prairie dogs.						
Milestone 1: By 2019, work with local experts to review modeling method and data inputs to provide an updated prairie dog habitat suitability model and GMAP target viability criteria to map current conditions for the mixed grass prairie mosaic and prairie dog colonies across the relevant grassland landscape to serve as guidance for plan updates.	4	Attachment A	2021/2022	Yes	No	Yes
Milestone 2: By 2019, based on Milestone 1, work with local experts to update and implement GMAP goals relevant to prairie dogs along with receiving site location criteria (I-1) to fully utilize existing grassland receiving sites and to allow additional qualified grassland receiving sites.	4	Attachment A	Dependent on OSMP Master Plan Implementation Planning- include in GMAP update	Yes	No	Yes
Strategy 3: Manage prairie dog colonies for plague resistance.						
Milestone 1: Prior to implementing the plan under Milestone 2 (below), all translocated prairie dogs will receive plague abatement.	1	Attachment B1	On-going	Yes	Yes	Yes
Milestone 2: By 2019, complete and implement a plague-management and monitoring plan using proven-efficient state-of-the-art plague management techniques to secure sustainable and plague-resistant prairie dog colonies.	3	Attachment A	2019/2020	Yes	Yes	Yes
Milestone 3: By 2019, work with Integrated Pest Management (IPM) to ensure implementation of an acceptable policy that may limit the use of insecticides but allows such use on large prairie dog ecosystem colonies as necessary.	1	Attachment B1	On-going	Yes	Yes	Yes
Strategy 4: Complete and implement a plan for the reintroduction of the black-footed ferret into large prairie dog occupied areas as a key native predator.						

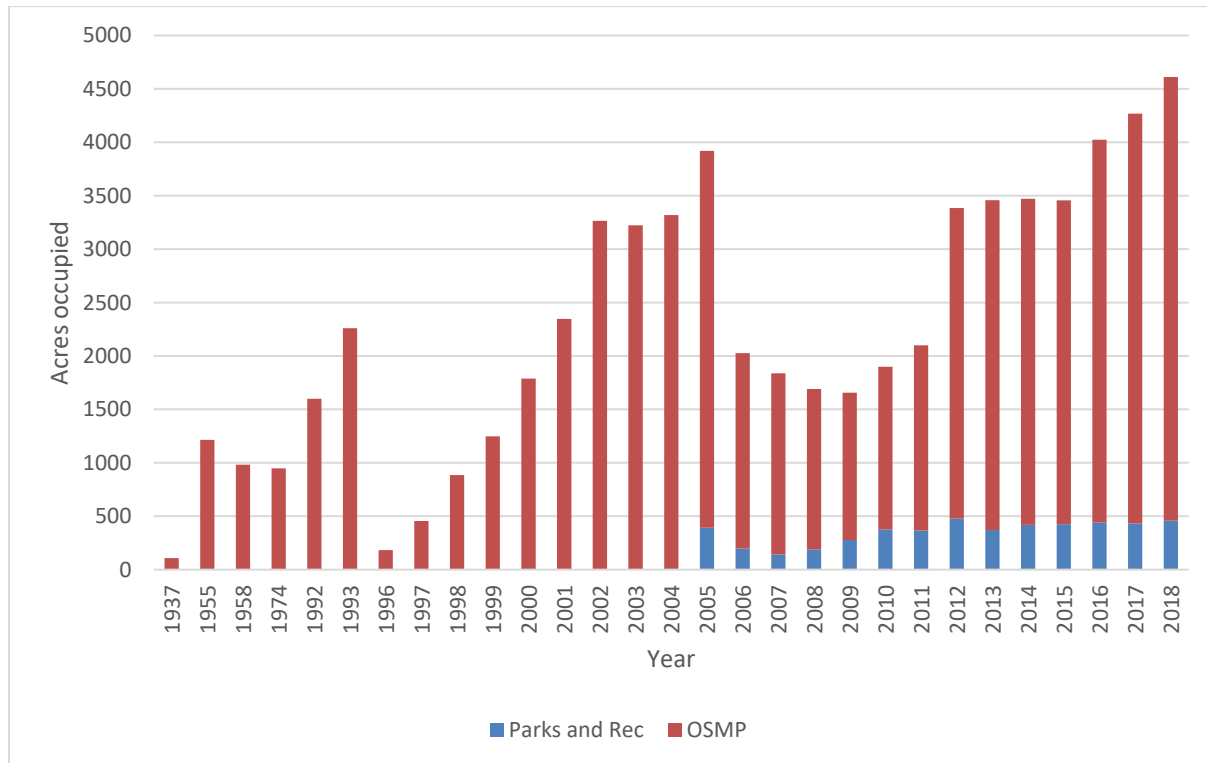
Goal/Objective/Strategy/Milestone	Category	Memo Attachment	Summary Status/Proposed Initiation	OSMP Implications	Planning Implications	PR Implications
Milestone 1: By 2020, work with adjacent landowners, including the County of Boulder and adjacent counties, US Fish & Wildlife Service, other federal partners, and private landowners in the Grasslands Preserve to create and implement a black-footed ferret recovery plan for the southern Boulder Region.	4	Attachment A	2021/2022	Yes	No	No
Strategy 5: Apply the mitigation hierarchy (avoid, minimize, mitigate) regarding adverse impacts to at-risk species known to be vulnerable to habitat-altering land management practices associated with prairie dog conservation.						
Milestone 1: Based on identified prairie dog occupied and relocation sites, update inventory and monitoring data for at-risk species associate with the mixed grass prairie mosaic and xeric tallgrass prairie.	2b	Attachment B1	2022	Yes	No	Yes
Milestone 2: Document relevant compatibilities of relevant land use and management options applicable to prairie dog relocation sites and occupied colonies (e.g., use of insecticides relative to rare insect species, density of prairie dogs relative to rare plant species).	2b	Attachment B1	2022	Yes	No	Yes
Objective 2: Secure and implement a suite of non-lethal methods for prairie dog populations in lands where their proximity to urban and agricultural land use, and other natural values are in conflict.						
Strategy 1: Collaborate with county, federal, and private partners to implement non-lethal prairie dog relocations.						
Milestone 1: In the near term, due to high occupancy of conflict areas, there is an increase in the number of successful translocations across the Boulder region.	2a	Attachment B1; Attachment B2	On-going	Yes	No	Yes
Strategy 2: Invest in creating buffer zones on key prairie dog colonies in conflict.						
Milestone 1: Pilot by 2021 one property that has prairie dog colonies with managed buffer zones.	2a	Attachment B1	2020	Yes	No	No
Strategy 3: Collaborate with the research community to advance testing of new and emerging tools for managing prairie dog population (such as oral contraception agents).	1	Attachment B1	On-going	Yes	No	Yes
Objective 3: Amend as necessary and keep all existing prairie dog plans and policies (including but not limited to the Admin Rule, IPM, UWMP, GMP, Wildlife Protection Ordinance) current as needed to ensure they are mutually compatible with Goal 1 and its objectives and strategies.						
Strategy 1: Review interdependency among policies and identify needed changes; establish a priority amongst current policies; and establish and implement a timeline for plans and policies that need to be updated.						
Milestone 1: By 2020, complete policy review and initiate processes for policy amendments.	2a	Attachment B1	On-going	Yes	Yes	Yes
Social Coexistence Goal: Support proactive and innovative non-lethal strategies to minimize conflicts associated with prairie dogs and competing land uses. Increase public awareness of the prairie dog's role in Boulder's Grassland and Urban ecosystems through community outreach.						
Objective 1: Identify and map areas of conflict that can be quantified and tracked annually.						
Milestone 1: By 2019, identify and map conflict areas annually and make it easily available to the public.	2a	Attachment B1	Deferred	Yes	Yes	Yes

Goal/Objective/Strategy/Milestone	Category	Memo Attachment	Summary Status/Proposed Initiation	OSMP Implications	Planning Implications	PR Implications
Objective 2: Identify and implement innovative proactive non-lethal strategies to address conflicts in each defined category.						
Agriculture (leased/private): Evaluate/Provide barriers or other exclusion/mitigation methods.	2a	Attachment B1; Attachment B2	2020	Yes	No	No
Private and adjacent land owners: Evaluate/Provide barriers on City of Boulder land adjoining high-conflict areas.	2b	Attachment B2	Amended	Yes	No	Yes
Add additional criteria to definition of future PCAs in the Grasslands Management Plan to consider the level of conflict with adjoining properties.	3	Attachment A	Dependent on OSMP Master Plan Implementation Planning- include in GMAP update	Yes	No	Yes
Land developers: Follow newly proposed protocol for relocations.	1	Attachment B1	Complete/On-going	Yes	Yes	Yes
Communication and Protocols: Have clear and consistent communication among all agencies.	1	Attachment B1	On-going	Yes	Yes	Yes
Communication and Protocols: Review protocols and update as necessary.	1	Attachment B1	On-going	Yes	Yes	Yes
Explore additional opportunities for relocations in Southern Grasslands by evaluating current relocation criteria, in conjunction with Ecological Goal efforts, to alleviate conflicts in other areas.	4	Attachment A	Dependent on OSMP Master Plan Implementation Planning- include in GMAP update	Yes	No	Yes
Work towards the reintroduction of the black-footed ferret using connected parcels from the public/private sector to achieve this goal as a natural strategy in prairie dog management.	4	Attachment A	2020/2021			
Collaborate with community partners (ex: Prairie Dog Coalition or Defenders of Wildlife) to implement conflict prevention strategy.	2b	Attachment B1	2022	Yes	Yes	Yes
Milestone 1: By end of 2019, initiate a pilot program to implement a conflict prevention strategy in at least two adjoining conflict locations.	2b	Attachment B1	2022	Yes	No	No
Milestone 2: By 2020, proactively address 10% of defined conflict areas annually.	2b	Attachment B2	On-going	Yes	No	No
Objective 3: Review mechanisms for communication and update as required to ensure prairie dog management conflicts and concerns are addressed in an effective and timely manner.						
Strategy 1: Establish who to call when conflicts with illegal activity arise and when animal control cannot be reached.	1	Attachment B1	Complete/On-going	Yes	Yes	Yes
Objective 4: Develop a campaign to engage Boulder are residents to expand their appreciation of the role of prairie dogs in native grasslands in Boulder County and the complex nature of their management.						
Strategy: Create surveys to gauge public awareness and concerns based on historical efforts.	2a	Attachment B1	Deferred	Yes	Yes	Yes

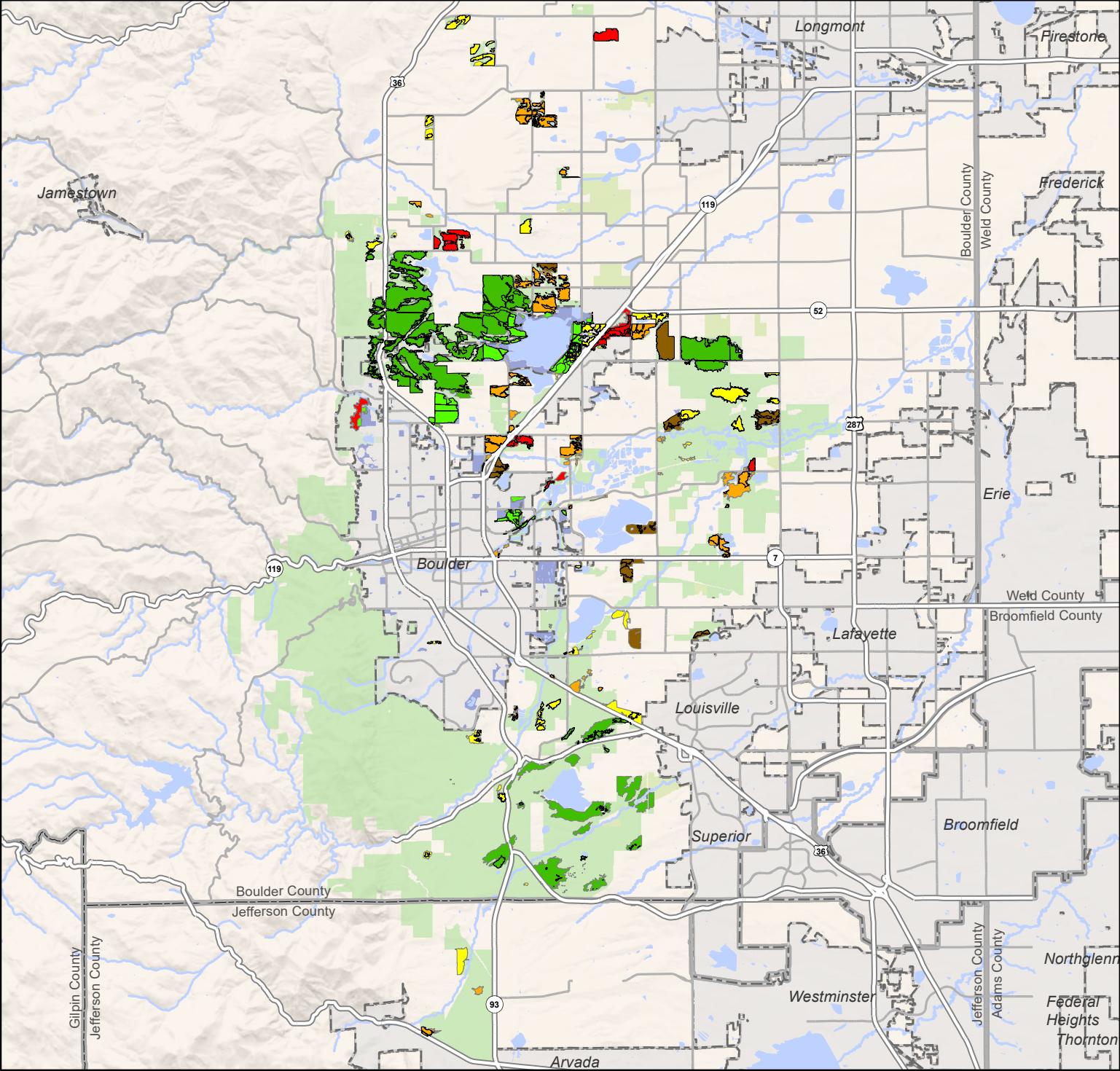
Goal/Objective/Strategy/Milestone	Category	Memo Attachment	Summary Status/Proposed Initiation	OSMP Implications	Planning Implications	PR Implications
Strategy: Campaign for more public awareness, engage the public through technology, Boulder newsletters and community outreach programs. Presentations at local libraries, schools, Boy/Girl Scout troops and 4-H groups are ways to reach out to the community.	2a	Attachment B1; Attachment B2	Deferred	Yes	Yes	Yes
Strategy: Provide Boulder residents opportunities to contribute to prairie dog conservation through assistance with environmental monitoring and outreach programs.	2a	Attachment B1	2020	Yes	Yes	Yes
Strategy: Better educate public about plague and update informational sites.	2a	Attachment B1; Attachment B2	Partially deferred	Yes	Yes	Yes
Objective 5: Develop annual assessment feedback mechanisms.						
Strategy 1: Reevaluation of adaptive management practices.	2a	Attachment B1	On-going	Yes	Yes	Yes
Objective 6: Secure modifications to state regulations to facilitate the transfer of prairie dogs across county lines.						
Strategy 1: Lobby neighboring county commissioners and state legislators to advocate for these adjustments, providing protocols and language for legislation.	1	Attachment B1	On-going	No	Yes	No
Economic Goal: Implement sustainable processes that provide resources and capacity to secure prairie dog conservation associated with the City of Boulder.						
Objective 1: Apply principles of Net Positive Impact (avoid, minimize, mitigate, seek net positive gain) on prairie dog conservation activities, including relocation projects, associated with the City of Boulder.						
Strategy 1: Utilize habitat quantification tool to score sites (removal and receiving) to help offset on-site impact of development and determine net-positive impact.						
Milestone 1: By 2020, pilot the use of the adapted habitat quantification tool developed to determine Net Positive Impact in one or more scenarios within the city.	2b	Attachment B2	Deferred	Yes	No	No
Objective 2: Establish a grassland conservation fund that augments operating budgets for meeting prairie dog management and is used for expenditures including, but not limited to acquisition (fee title and/or easements), relocations and stewardship		Attachment B2	Under evaluation			
Strategy 1: Establish inflow and outflows of monies into and out of the grassland conservation fund.						
Milestone 1: By 2019, create and implement a required fee structure for private landowners relocating prairie dogs to city land.	2a	Attachment B1; Attachment B2	Under evaluation	Yes	Yes	Yes
Milestone 2: Work with Boulder's philanthropic community (e.g., Community Foundation of Boulder County) to identify opportunities to provide sustainable support to prairie dog conservation in the Boulder region.	2b	Attachment B2	Under evaluation	Yes	Yes	Yes
Milestone 3: By 2020, work with conservation entities to identify conservation practices, programs and funding mechanisms that could support grassland restoration and the mitigation of conflicts on agricultural land.	2a	Attachment B1	Deferred	Yes	No	No

Goal/Objective/Strategy/Milestone	Category	Memo Attachment	Summary Status/Proposed Initiation	OSMP Implications	Planning Implications	PR Implications
Strategy 2: No less frequently than once, but no more frequently than twice a year, there will be a publicly-noticed meeting that includes invitations to members of the PDWG with an opportunity for the members to discuss progress on the ecological, social, and economic goals and strategies and contribute to the adaptive management process.	1	Attachment B1	2019	Yes	Yes	Yes
Milestone 1: By December 2019, staff will provide an annual report on the inflows and outflows.	2b	Attachment B1	Deferred	Yes	Yes	Yes
Milestone 2: By 2019, staff will provide their respective department board or commission with annual updates on the status of goals and objectives as well as a review of, and advertisement on, inflows and outflows of the grasslands conservation fund.	2b	Attachment B1	Partially Deferred	Yes	Yes	Yes
Objective 3: Support sufficient budgets for city staff to fulfill their roles in achieving the approved PDWG goals, objectives, and strategies as well as recommended changes to plans, policies and practices.						
Strategy 1: Revisit and amend department budget allocations (including a line item for prairie dog management), and annual work plan objectives for staff to ensure they are compatible with, and can accomplish, the PDWG goals and objectives.						
Milestone 1: Recommend departmental operating budget line items for prairie dog management in the 2020 budget.	1	Attachment B1	2019	Yes	Yes	Yes
Milestone 2: Annually ensure each relevant department has sufficient budgets, staffing and/or consultants to meeting the prairie dog management goals and objectives.	2a	Attachment B1	On-going	Yes	Yes	Yes
Strategy 2: Maximize in-kind contributions to assist with addressing prairie dog management.						
Milestone 1: By 2019, create a pilot project with at least two outside organizations to help fulfill the PDWG goals and objectives by maximizing in-kind contributions (i.e., donation of nest boxes or fence/barrier materials or installation).	2a	Attachment B1	On-going	Yes	No	No
Milestone 2: Track in-kind contributions on an annual basis and make data available for other funding opportunities.	2b	Attachment B1	On-going	Yes	Yes	Yes

Attachment F (Figure 3): City Prairie Dog Occupation Through Time

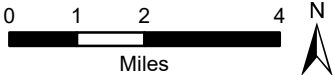


Attachment G: City of Boulder Prairie Dog Colony Management

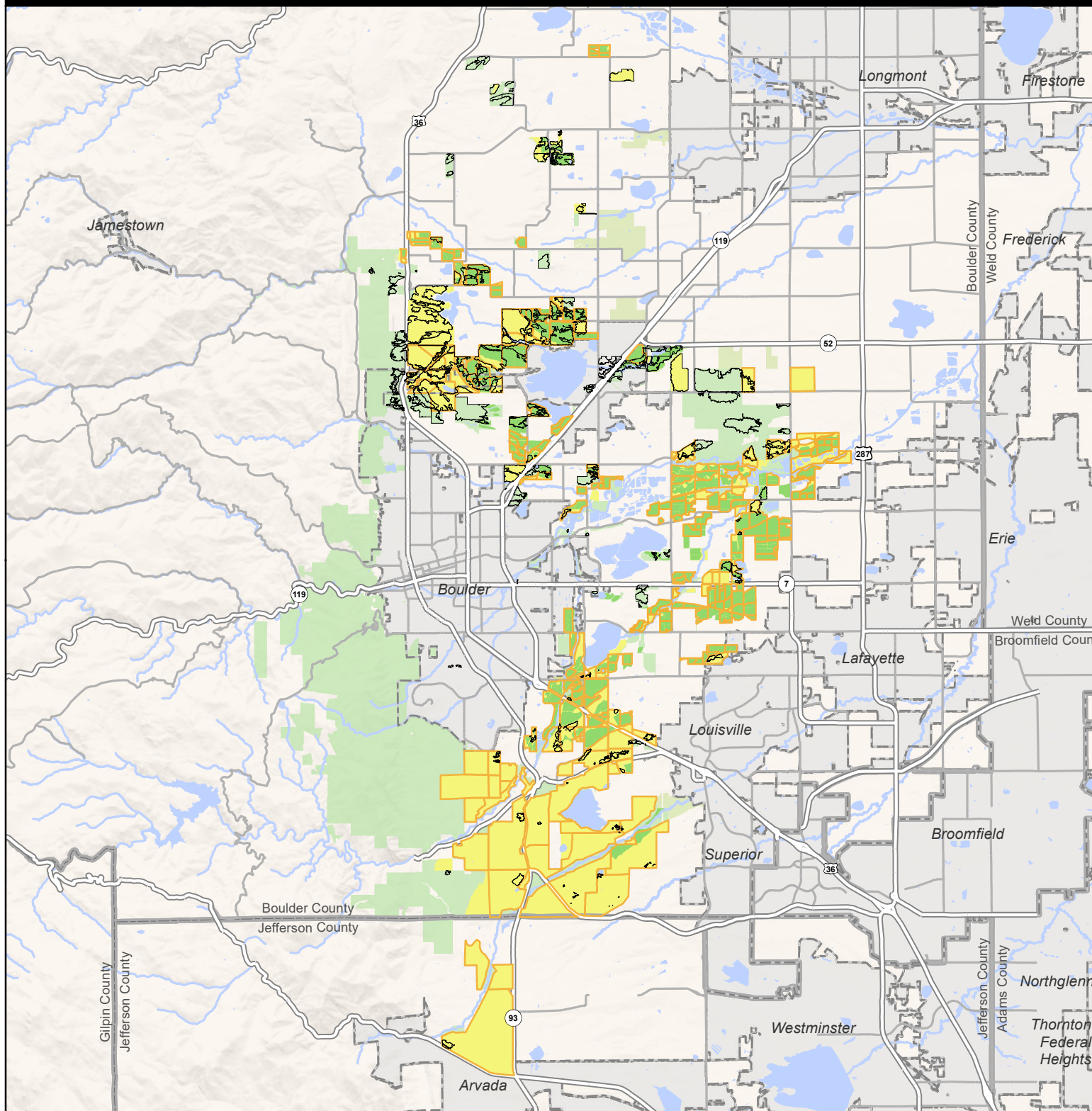


Legend

- | | | |
|---|-----------------------------|----------------------|
| 2018 Active Colonies (OSMP / Natural Lands) | Parks & Recreation Land | Highway |
| Parks/Natural Lands Prairie Dog Colony Maximum Extent | OSMP Managed Land | Arterial |
| OSMP Prairie Dog Colony Management (Maximum Extent) | | |
| Grassland Preserve | OSMP Land Managed by Others | Major Creeks |
| Prairie dog Conservation Area | Cities | Reservoirs and Ponds |
| Multiple Objective Area | County Boundary | |
| Transition Area | | |
| Removal Area | | |



Attachment H: OSMP Prairie Dog Colonies on Agricultural Lands



Legend

- | | |
|----------------------------------|----------------------|
| Active Prairie Dog Colonies 2018 | Highway |
| Leased Agricultural Fields | Arterial |
| Irrigable Lands | Major Creeks |
| Agricultural Fields | Reservoirs and Ponds |
| OSMP Managed Land | Cities |
| OSMP Land Managed by Others | County Boundaries |

