

TO: Open Space Board of Trustees

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SUBJECT: Agricultural Resources Management Plan

I. PURPOSE

The purpose of this study session is to provide an opportunity for the Open Space Board of Trustees (OSBT) and staff to discuss the scope, framework and planning approach for the Agricultural Resources Management Plan.

II. QUESTIONS FOR THE BOARD

1. What topics, if any, do OSBT members recommend be added to topics described in the Issues section?
2. Does the OSBT have any questions or comments on the recommended organization for the Agricultural Resources Management Plan (Agricultural Plan)?
3. Does the OSBT have any questions or comments on the timeline and planning process proposed by staff to develop the Agricultural Plan?

III. BACKGROUND

Open Space and Mountain Parks Charter Direction and Agricultural Operations Background

One of the City Charter purposes of open space is “the preservation of agricultural uses and land suitable for agricultural production.”¹ Ongoing agricultural production is a well-established function of Open Space and Mountain Parks (OSMP) land. The charter also lists the “preservation of water resources in their natural or traditional state” as an open space purpose. Water resources in a “traditional state” include the use of water rights for agricultural production on OSMP.

- **Agricultural leases on 14,330 acres**

Approximately 14,330 acres of OSMP land are leased for agricultural production (Attachment A), which comprise almost one-third of the total lands managed by OSMP (approximately 45,000 acres).

¹ OSMP Charter Article XII. Open Space sec. 176. Open space purposes – Open space land.

Table 1: Acres of Land in Agricultural Operations

OSMP Agricultural Land	Acres
Grazed Fields (not irrigated)	11,319
Irrigated Fields	4,900
Grazed and Cultivated Fields	2,253
Cultivated Fields	757

- **Water rights**

OSMP’s portfolio of water rights draws from the four major creek drainages in the Boulder Valley (Boulder Creek, South Boulder Creek, Coal Creek, and Left Hand Creek), springs and groundwater. This portfolio contains many senior water rights which establish a reliable source of irrigation in most years. These water rights are used to irrigate the approximately 4,900 acres of city open space.

- **Livestock grazing and hay production are primary uses**

The primary uses of OSMP agricultural land are livestock grazing and hay production. Hay, as feed for horses, has become a significant commodity in the last several decades. Increasing numbers of rural homes where people are keeping horses on acreages too small to meet year-round forage needs is creating a year-round demand for hay.

- **Annual crops**

Annual crops are grown on 300-600 acres of OSMP land each year. Crops commonly grown include wheat, corn and barley.

- **Certified Organic**

Ninety-two (92) acres have organic certification or are transitioning to organic certification. Perennial grasses (for hay production or grazing) and vegetables are currently grown. There are three tenants producing vegetables, which are sold at local farmers’ markets, restaurants, schools, grocery stores and through Community Supported Agriculture (CSA) programs. Combined, these farms have 18 acres of vegetables planned for the 2014 growing season.

- **Agricultural commodities and “open” agriculture**

In the past, OSMP staff has rarely established commodity specific agricultural objectives, leaving the choice of what to grow to agricultural lessees. The significant exception is the prohibition of the use of genetically modified organisms (GMOs). Lessee’s continue to have the freedom to decide what to grow and to a large degree how to manage their agricultural operations. Choices of agricultural commodities are influenced by local markets and the lessee’s ability to sell a product profitably.

In addition to farming and ranching, OSMP leases include a horse boarding operation at Boulder Valley Ranch and a therapeutic riding facility at Cherryvale.

Management of OSMP lands has maintained traditional agricultural production as outlined in the City Charter. The City Charter prohibits the improvement of open space after acquisition unless such improvements are necessary to provide for open agriculture (and other services unrelated to

agriculture). Open agriculture refers to agricultural uses which predominantly occur outside and include grazing, keeping livestock, and the production, harvesting, and selling of agricultural products.

The Grassland Ecosystem Management Plan² (Grassland Plan) Agricultural Operations Target³

At the foundation of the Grassland Plan are “conservation targets,” which were identified as the aspects of the grassland planning area that would best serve as the basis for setting objectives, taking action and measuring success. Agricultural Operations was one of the eight targets.⁴ The Agricultural Operations target addresses the long-term sustainability of agriculture on OSMP lands and the conservation of native species dependent upon agricultural operations.

In order to assess the viability of Agricultural Operations, the Grassland Plan identified a limited number of key attributes and indicators. Key attributes are aspects of Agricultural Operations, which if altered can result in the improvement, degradation or loss of the target. Indicators are entities that are measurable and specifically related to one or more key attributes. Table 2 lists the key attributes and indicators identified in the Grassland Plan for Agricultural Operations.

Table 2: Key Attributes and Indicators for Agricultural Operations
(key attributes as shaded rows)

Agricultural Production
Acres in agricultural production
Irrigable land leased for agriculture
Animal Species Composition
Management of class A and class B bobolink nesting habitat
Physical and Chemical Soil Regimes
Percent soil organic matter
Vegetation and Soil Conditions
Percent of grazed areas in good condition according to an integrated measure of range quality

All of the indicators, with the exception of “Management of class A and class B bobolink nesting habitat” were given a “good” rating in the Grassland Plan. The management of bobolink nesting habitat was given a rating of “fair.”

• **Agricultural Production**

The Grassland Plan identified *acres in agricultural production* as one of the measures to assess the level of agricultural production. OSMP currently leases approximately 14,330 acres for agricultural production. In addition, agriculture is the dominant use on approximately 3,000 acres of conservation easements protected by OSMP. In 2008 there were approximately 80,000 acres of agricultural land in the county. One model used to generate estimates of agricultural

² Approved by the OSBT in August 2009 and accepted by City Council in May 2010.

³ Grassland Ecosystem Management Plan

⁴ The other conservation targets are Mixedgrass Prairie Mosaic, Xeric Tallgrass Prairie, Mesic Bluestem Prairie, Black-Tailed Prairie Dog and Associates, Wetlands, Riparian Areas and White Rocks.

land predicts that by 2020 there will be approximately 40,000 acres of agricultural land remaining in the county—an amount approximately equal to the extent of land currently managed for agriculture by Boulder’s city and county open space programs. If current trends continue, OSMP lands will be an increasingly critical component of agricultural land in the county. While it is unknown whether existing open space agricultural lands alone could support an agricultural economy, staff’s best professional judgment led to a rating of “good.”

Irrigable lands leased for agriculture was identified as the other measure to assess the level of agricultural production. Irrigated lands are the most agriculturally productive in the Boulder Valley. Under Colorado water law, if OSMP or any water right owner fails to use their water rights, those rights can be abandoned, partially abandoned, reduced by decree at the time of a water transfer and/or reduced in value. OSMP seeks to avoid such a loss or reductions because under most circumstances they result in financial and opportunity costs for OSMP’s land and water management programs.

OSMP lacks the staffing resources to irrigate many or large areas. Leasing water and irrigable lands to local farmers and ranchers has been an effective way to maintain water rights and agricultural land values and provide a modest source of revenue for the department. OSMP works in partnership with lessees to run water on departmental lands, and uses staff to run water on irrigated properties that are not currently leased. In order to maximize production and protect water rights, OSMP seeks to ensure that irrigable lands are leased to the maximum extent possible. At the time of writing the Grassland Plan, 85% of irrigable lands, and nearly all irrigated lands, were leased for agricultural production, giving this indicator a rating of “good.”

- **Animal species composition**

OSMP staff identified the ***Management of class A and class B bobolink nesting habitat*** as the measure to assess the animal species composition of the city’s agricultural lands. Bobolinks are ground-nesting songbirds that originally nested in tallgrass or mixedgrass prairie, but because of land conversion, have now increased their use of irrigated hayfields. The bobolink has had extreme population decline during the past thirty years and are protected under the Migratory Bird Treaty Act, are considered “vulnerable to extirpation” by the Colorado Natural Heritage Program and a “rare breeding species” by the Boulder County Comprehensive Plan. The use of hayfields as nesting habitat creates a potential management conflict as most operators would like to maximize yields, which translates to several harvests (i.e. mowings) each season.

Bobolinks nest in the summer when much of the mowing typically occurs. Biologists have documented very high failure rates of bobolink nests because of hayfield mowing. The consensus is that postponing mowing until July 15 allows for the majority of fledglings to be able to sustain flight and avoid mowing impacts. This indicator refers to the proportion of high quality breeding habitat on which mowing is deferred until after July 15 (or the actual date of bobolink fledging as determined by monitoring).

In order to identify key bobolink breeding sites, OSMP initiated a hayfield bird monitoring program in 2000. Using abundance and density information from the hayfield bird monitoring program, staff chose four top-tier fields to be designated Class A Bobolink Management Areas (in these areas mowing would only occur after July 15 annually) and identified 14 second-tier

fields as candidates for Class B Bobolink Management Areas. In these areas mowing would only occur after July 15 once every three years. Staff determined that only five of the 14 fields identified as candidates for designation as Class B Bobolink Management Areas were either already being managed in a manner consistent with the Class B Management Area Criteria or could easily be managed in such a manner. Based on this information this indicator was given a rating of “fair.”⁵

- **Physical and chemical soil regimes**

Percent soil organic matter was selected as the measure to assess the condition of the physical and chemical soil regimes of agricultural lands. Soil organic matter is living plant tissue and decomposed or partially decomposed material from living plants and animals. Soil organic matter improves soil structure, maintains soil aggregation, minimizes erosion and is an important source of plant nutrients. These functions are all directly associated with and affect agricultural operations and productivity.

It is possible for grazing or other types of harvest to result in organic soil matter depletion faster than rates of accumulation. When removal exceeds plant growth and decomposition, long-term soil productivity decreases. Restoring higher levels of productivity is often difficult and expensive. OSMP has not yet sampled percent soil organic matter in a manner that allows staff to estimate trends. However, percent soil organic matter was given a rating of “good” according to OSMP staff’s best professional judgment and familiarity with conditions on the ground.

- **Vegetation and Soil Conditions**

Vegetation and soil conditions have an effect on agricultural operations. *Percent of grazed areas in good condition according to an integrated measure of range quality* was identified in the Grassland Plan as one of the measures to assess whether the grazing practices are improving the condition of the land. Observations by OSMP staff have historically been the means of evaluating range and soil conditions. This indicator was given a rating of “good” in the Grassland Plan according to OSMP staff’s best professional judgment and familiarity with conditions on the ground. However, qualitative observations have limitations. This indicator specifies the desire to develop a less subjective monitoring method that is easily repeatable and documented to assess grazing land soil stability, hydrologic function, as well as structural and functional resilience to disturbance.

Grassland Plan Strategies

The Grassland Plan identified strategies to maintain or move the indicators to a good or very good condition, or in other words restore or maintain the viability of the targets and address the stresses facing the targets. Agricultural Operations was uniquely positioned in the Grassland Plan, in that it was both a conservation target and one of the sources of stress affecting other targets. Therefore, the strategies listed below have multiple objectives; they are related to improving the conditions of Agricultural Operations directly as well as the conditions of other Grassland Plan Targets affected by Agricultural Operations, thereby balancing and blending

⁵ Bobolink Indicator Fair Rating: 100% of Class A Bobolink Management Areas mowed after 7/15 annually and 30-75% of Class B Bobolink Management Areas mowed after 7/15 in one out of three years.

agricultural and ecological management. Table 3 lists the strategies related to Agricultural Operations.

Table 3: Agricultural Operations Related Strategies

(Bolded font indicates strategies that the Agricultural Plan will further develop. More detailed information on strategy development is provided in the Issues section.)

Enhance prescribed grazing program through improvements to fencing, livestock watering facilities, stocking rate and seasonal use adjustments, and the establishment of one or more grass banks
Manage agricultural activities to minimize soil erosion and protect soil fertility
Refrain from mowing the “Class A Bobolink Management Areas” until after bobolink fledging
Construct, repair, enhance and maintain irrigation delivery system
Collaborate with neighboring land management agencies to establish compatible land management practices
Promote conservation of the Grassland Plan targets by increasing awareness of grassland values and conservation issues
Identify and obtain water rights needed to support irrigated agriculture
Evaluate the suitability of alternative agricultural practices for OSMP lands
Establish ten Class B Bobolink Management Areas and refrain from mowing each area until after bobolink fledging (July 15) one year out of three
Develop a safe and effective prescribed fire program for the Grassland Planning Area
Manage Ute ladies’-tresses orchid habitat with compatible grazing, haying and irrigation practices
Treat non-native (invasive or unwanted) plant species in the grassland Planning area using appropriate integrated pest management techniques

IV. ISSUES

The Need for and Goal of the Agricultural Plan

The need for an Agricultural Plan arises from:

- City Charter approved by voters in 1967. Resource Management Plans are developed to guide the management of the charter purposes.
- City Council 2014 work plan priority.
- A need to specify management actions that will implement the broader agricultural and ecological vision articulated in the Grassland Plan and provide a framework for continuing to balance and blend agricultural and ecological management.
- An increased community desire to sustain local farming.
- A need to ensure policies are developed and formalized in order to maintain desired agricultural operations.

The purpose of the Agricultural Resources Management Plan is to ensure the long-term sustainability of agricultural operations and the ecological health of OSMP lands and to foster connections between the community and agricultural operations.

This goal is consistent with and furthers the Grassland Plan’s purpose of providing a framework for on-the-ground management action, public policies, and land and water acquisition priorities to ensure on-going agricultural production.

Implementing the Agricultural Guidance Presented in the Grassland Plan

The Grassland Plan introduced several indicators and strategies that the Agricultural Plan will develop further either by more precisely defining standards or analyzing and evaluating implementation alternatives and actions. The Agricultural Plan will focus on developing the Grassland Plan strategies listed in Table 4.

Table 4: Agricultural Plan Components and Related Grassland Plan Guidance

Grassland Plan Guidance	Agricultural Plan Component
Manage agricultural activities to minimize soil erosion and protect soil fertility.	<ul style="list-style-type: none">• Develop a protocol to sample percent soil organic matter on a regular basis that would allow staff to estimate trends and set the standards and refine the ratings that will define desired conditions. Because different types of agricultural management affect soil organic matter differently, the protocol will include system-wide sampling on each of the four types of agricultural land use on OSMP (annual cropping systems in dry lands, irrigated annual cropping systems, irrigated pasture/hayfield, grazing of native grasslands).

Grassland Plan Guidance	Agricultural Plan Component
<p>Manage agricultural activities to minimize soil erosion and protect soil fertility.</p>	<ul style="list-style-type: none"> • Develop an integrated measure of range quality that is easily repeatable and documented to assess grazing land soil stability, hydrologic function, as well as structural and functional resilience to disturbance. Set standards/refine ratings that will define desired conditions.
<p>Enhance prescribed grazing program through improvement to fencing, livestock watering facilities, stocking rate and seasonal use adjustment, and the establishment of one of more grass banks (areas under lease that are not grazed - leaving them available to shift grazing there if conditions elsewhere determine such a shift would be beneficial).</p>	<ul style="list-style-type: none"> • Analysis to identify and prioritize improvements to: <ul style="list-style-type: none"> ○ Fencing alignments to allow for rotational, deferred (rest rotation) and seasonal stocking systems. ○ Livestock watering facilities/water resources to improve OSMP’s flexibility in distributing livestock. ○ Current stocking rates, timing and duration. • Analysis to determine how best to maintain or improve native grasslands through the grazing program. • Analysis to determine best location(s) for grass bank(s).
<p>Construct, repair, enhance and maintain irrigation delivery system.</p>	<ul style="list-style-type: none"> • Analysis to prioritize improvements and maintenance. (<i>A significant amount of the maintenance to the water delivery systems has been deferred. The Grassland Plan estimated the cost at \$2 million before the flood of 2013.</i>) • Locate existing measuring devices that can quantify use, and identify and prioritize locations to install additional measuring devices. • Develop protocol for monitoring water use at key locations. • Determine how to avoid or minimize impacts from the maintenance and operation of the irrigation water delivery system to other resources. • Develop a ditch burning schedule to be integrated with the prescribed fire program. • Inventory the locations of junction boxes, assess their condition, and estimate the scope and timing of repairs or replacement.

Grassland Plan Guidance	Agricultural Plan Component
<p>Identify and obtain water rights needed to support irrigated agriculture</p>	<ul style="list-style-type: none"> • Analyze irrigation water requirements and availability. • Refine irrigation water models. • Analyze site conditions and water availability to identify lands where irrigation is not cost effective. (Water rights associated with these properties may be useful for supplementing irrigation on higher quality sites, establishing in-stream flow programs.)
<p>Promote conservation of the Agricultural Operations Target by increasing awareness of agricultural values and conservation issues.</p>	<ul style="list-style-type: none"> • Foster connections between the community and agricultural operations. • Establish connections between producers and local consumers/community. Analyze opportunities and barriers. • Examine the feasibility of establishing a meat marketing cooperative, or meat CSA. Examine the opportunities for creating direct sales in the existing marketplaces (e.g. farm stands, farmer’s markets).
<p>Evaluate the suitability of alternative agricultural practices for OSMP lands.</p>	<ul style="list-style-type: none"> • Increase diversified organic vegetable farming on OSMP land. • Conduct a best opportunity analysis to evaluate potential locations for alternative agricultural practices on OSMP. • Evaluate the suitability/feasibility of other alternative agricultural uses. • Examine the feasibility of establishing a meat marketing cooperative, or meat CSA. Examine the opportunities for creating direct sales in the existing marketplaces (e.g. farm stands, farmers’ markets).
<p>Establish ten Class B Bobolink Management Areas and refrain from mowing each area until after bobolink fledging (July 15) one year out of three.</p>	<ul style="list-style-type: none"> • Determine which 10 of the class B candidates (from the Grassland Plan) would be best added to the Class B Management areas. Analysis will use recently collected hayfield bird monitoring data.

Grassland Plan Guidance	Agricultural Plan Component
Manage Ute ladies’-tresses orchid habitat with compatible grazing, haying and irrigation practices.	<ul style="list-style-type: none"> • Reiterate the Ute ladies’-tresses orchid strategies identified in the Grassland Plan. • Determine where management could be improved or established on new properties.
Treat non-native (invasive or unwanted) plant species in the Grassland Planning Area using appropriate integrated pest management techniques.	<ul style="list-style-type: none"> • Develop an IPM policy specific to OSMP agricultural lands to manage invasive species/pests on open space agricultural lands in a way that minimizes environmental impacts, increases productivity and minimizes the use of pesticides and herbicides.

Increased Community Desire to Sustain Local Farming

The 2008 Farm Bill defined local or regional food as a product that traveled *less than 400 miles from its origin, or within the State in which it is produced*.⁶ The increased dominance of “local” in national dialogues about food is reflected in the increase in the number of farmers’ markets nationwide (up 184% from 2000 to 2013)^{7,8} and advertising in grocery stores that identifies state and even farm of origin (e.g. Colorado Proud and Jersey Fresh). Consumer preferences for buying local include perceived quality and freshness of local food and support for the local economy. These consumers are willing to pay higher prices for a product they believe to have better quality, nutritional value and methods of production that are better for the environment. This market was estimated to be \$4.8 billion in 2008.

Production and sale of locally marketed and direct to consumer food items is more likely to occur on small farms located in or near metropolitan areas.⁹ The proximity of OSMP properties to large population centers, including Boulder, surrounding suburbs and Denver, make these agricultural properties prime for taking advantage of direct sale opportunities to consumers who are both health and environmentally conscious.

The Agricultural Plan will evaluate the potential for additional OSMP lands to be used for local consumption. This evaluation will:

- Analyze the barriers/opportunities to finishing and harvesting beef locally
- Establish a definition of natural beef for producers on OSMP lands, and an analysis of how to best support natural beef production on OSMP lands
- Examine local marketing strategies
- Examine ways to establish connections between local producers and consumers.

⁶ SEC. 6015.H.R. 6124 *Food Conservation and Energy Act of 2008* http://www.usda.gov/documents/Bill_6124.pdf

⁷ <http://www.ams.usda.gov>

⁸ Martinez *et al.* *Local Food Systems Concepts, Impacts, and Issues* Economic Research Report 97

⁹ http://www.ers.usda.gov/media/122868/err97_1_.pdf

Policies

Several policies have been identified by staff as needing evaluation or inclusion in the plan in order to support the management of agricultural operations. The identified policies are a Genetically Modified Organism (GMO), Lease Rate and Greenhouses.

- **GMO**

Due to potential risks to the environment and unknown consequences to consumers, staff recommended, in 2000 the department continue to prohibit the use of transgenic crops. This GMO policy was approved by the OSBT. In accordance with this policy staff: 1) sent a letter to each lessee, reinforcing the policy that transgenic crops on Open Space is not permitted, and that securing leases meant compliance with this provision 2) inserted language explicitly precluding transgenic crop production at the time of lease renewal and 3) required Open Space Resource Specialists approve crops to be planted.

- **Lease Rate**

Lease rates are generally determined by what a lessee bids. The Agricultural Plan will provide an opportunity to evaluate alternative lease rate policies.

- **Greenhouses**

As part of the desire to sustain local agriculture greenhouses are frequently suggested. OSMP currently lacks a formal policy allowing, limiting or prohibiting greenhouses. The Open Space Charter prohibits the improvement of open space land after it has been acquired by the city unless the improvements are necessary to provide for open agriculture (or support other services unrelated to agriculture). There *may be* circumstances where a greenhouse would meet the charter requirements, therefore a policy surrounding greenhouses and their appropriateness on OSMP lands, along with an analysis of the economic and energy tradeoffs will be included in the Agricultural Plan as the department evaluates ways to sustain local agriculture.

V. NEXT STEPS

OSMP staff will develop the plan through the third quarter of 2014 and into the beginning of the fourth quarter. Staff will hold a “scoping” open house for the community at the beginning of the plan development stage to gather input on the topics/issues to be addressed in the plan. Small or one-on-one meetings will be held with lessees to gather input on the plan components during the development of the draft plan. Update(s) for the OSBT will be scheduled. Upon completion of a draft plan it will be made available for broader public comment. Staff will hold an open house for interested members of the public and make appropriate changes to the plan based on public input. The plan will be submitted to the OSBT in the first quarter of 2015 for approval.

Table 5: Agricultural Plan Timeframe with Public, Lessee, and OSBT Input Opportunities

July	OSBT Study Session	Plan Development (Lessee Input)
August	Public Comment/Open House	
September		
October		
November	OSBT	
December		
January		
February	Public Comment/Open House	Draft Plan Review
March	OSBT	
2 nd Quarter 2015	City Council	

ATTACHMENT:

- A. Map of OSMP lands leased for agricultural production

Agricultural Uses for OSMP Leased Lands

