

Open Space Advisory Board

Agenda

Wednesday, June 12, 2024
Library 1st Floor Meeting Room
951 Spruce Street
7:00 PM

Members of the public are welcome to attend and give comments remotely; however, the in-person meeting may continue even if technology issues prevent remote participation.

- *Call in to: +1 346 248 7799 or +1 408 638 0968 or 877 853 5247 (Toll Free) Webinar ID: 883 3175 6380 or*
- *You can log in via your computer. Please visit the City's website here to link to the meeting: www.louisvilleco.gov/osab*

The Board will accommodate public comments during the meeting. Anyone may also email comments to the Board prior to the meeting at EmberB@LouisvilleCO.gov.

1. 7:00 pm Call to Order
2. Roll Call
3. Approval of Agenda
4. Approval of Minutes
5. 7:05 pm Public Comments on Items Not on the Agenda (5 minutes, more time as needed)
6. 7:10 pm Staff Updates (5 Minutes)
7. 7:15 pm Board Updates (10 Minutes)
 - Downtown Revitalization Plan-South Street Underpass

Persons planning to attend the meeting who need sign language interpretation, translation services, assisted listening systems, Braille, taped material, or special transportation, should contact the City Clerk's Office at 303 335-4536 or MeredythM@LouisvilleCO.gov. A forty-eight-hour notice is requested.

Si requiere una copia en español de esta publicación o necesita un intérprete durante la reunión, por favor llame a la Ciudad al 303.335.4536 o 303.335.4574.

8. 7:25 pm Discussion Item: Review a Draft Ordinance Amending and Clarifying OSAB's Role Related to Quasi-Judicial Matters. Presented by: Rob Zuccaro, Director of Community Development (20 Minutes). ***postponed to July meeting***
9. 7:45 pm Discussion Item: Redtail Ridge Construction Drawings-Trails. Presented by Bryon Weber, PROS Project Manager (60 Minutes). ***postponed to July meeting***
10. 8:45 pm Discussion Item: Review of Proposed Acquisition Process. Presented By Susan McEachern, OSAB Chair (10 Minutes)
11. 8:55 pm Action Item: OSAB Review of Potential use of Glyphosate and Prescribed Fire as Part of Small Isolated Research Plots. Presented by, Ember Brignull, Open Space Superintendent (15 Minutes)
12. 9:10 pm Discussion Items for Next Meeting July 10th, 2024
Possible Topics:
 - A. Discuss Option for a Tiger Team in Coordination With PPLAB to Identify Appropriate Locations for BMX/Pump Track Bike Course to Mitigate Damage to Open Space Natural Resources
 - B. Strategies for Protecting Habitat, Steve Jones Wildlife Consultant (July or August)
 - C. Off-Trail Education Regarding Grazed Areas (Staff Update)
 - D. Presentation by LOSA (August)
13. Adjourn

Open Space Advisory Board Meeting Minutes
Wednesday, May 8, 2024, 6:00pm
Louisville Public Library, 1st Floor Meeting Room
951 Spruce Street

1. 6:12 pm Call to Order

Pizza dinner and the meeting began.

2. Roll Call

Andrew Dorsey, Brad Pugh, Jessamine Fitzpatrick, David Blankinship, Susan McEachern, Michiko Christiansen, Mark Poletti via Phone.

Charles Danforth arrived late at 6 :45pm.

Staff members: Ember Brignull, Adam Blackmore, Jeff Durbin, Bryon Weber

Council member: Deborah Fahey

3. Approval of Agenda

Changed on the agenda, update from Bryon to proceed as drafted.

Motion made by David to be approved and Andy seconded. All approved.

4. Approval of Minutes

Jessamine motioned, and Andy seconded. All approved.

5. 7:05 pm Public Comments on Items Not on the Agenda (5 minutes, more time as needed)

Public in audience. No comments.

6. 7:10 pm Staff Updates (5 Minutes)

Ember:

- Lafayette's Open Space Advisory Committee is interested in our invitation to participate in a joint meeting with us. She shared the agenda items, and the committee will look at it to see if they can add additional topics. Aiming for September date; however, the Lafayette Open Space Coordinator likely will be on maternity leave then. Will prep the packet and will send us the revised agenda. Will keep us in the loop.
- Louisville Open Space Manager interviews in process working down to three candidates and will continue to interview them next week.
- First round of interviews for maintenance technician positions – 2 positions moving forward to get them on board.

- Nate is giving a presentation for the Wildfire Mitigation workshop at FRCC on May 29th. All are welcome to attend.
- Herbicide application postponed due to windy weather.
- Andy: What type of herbicide and for what purposes?
- Ember: Three types of weed categories divided into species A, B, and C following state definitions and requirements:
 - A: few and eradicate
 - B: same as A but larger populations that can only be controlled
 - C: extensive populations that can't be eradicated but try to contain as much as possible
- Spot treating the weeds instead of broadcast spraying.
- Cattle grazing this week at Davidson Mesa and North Open Space.
- Wayfinding: Powerline trail will see fabrication and installation. Budget approved for Lake-to-Lake trail as well for 2024. Staff will be assessing projected completion around July.
- Trail mowing will be starting.

Adam:

- Budget amendment was passed unanimously. 50/50 to parks and OS. New policy dedicates 30% of the new .125% tax (earmarked solely for open space) as a reserve for land acquisitions. Still working out the kinks with the policy, including establishing a potential cap.
- Discussed the vegetation survey. Citizen feedback has shown strong advocacy for a single comprehensive plan rather than smaller, separate plans. He hopes to combine all remaining aspects—including wildlife, repairing trails and environmental conditions of the property—into a single plan completed in 2025. Received funding (\$50,000 from OS, \$50,000 from Parks) to add a trails plan. It will address future trail opportunities, environmental impacts, social trails policy, and connectivity options Hecla Lake, restoration of the pipeline construction area, areas around the trails and habitat area with the equipment that has been approved for purchase. Fund was approved.
- Lastly, making room for new staff with office modifications and new equipment.

Future meetings dates:

- July 24 12:00pm -5:00pm - Budget meeting with project with the city council.
- June 11, 2024 - Encroachment meeting with the city council being postponed. Instead, there will be a city council discussion on the 2025 work plan.

CORRECTION: May 28, Sales use tax 101 will be moved to a later date. The May 28 meeting will be focusing on public safety and E- bike regulations. More information on the website.

- Susan to Adam: Will there be a trails study in addition to PROST?
- Adam: TBD, to ensure subject-area expertise will be allocated as a separate bid project with the same timeline parallel to PROST. It is important to have its own document

without PROST. Since OSAB is in the city charter, our primary responsibility is trails with the Master plan and we don't have one Master plan for the trails. This will benefit us with future connectivity.

- Susan: We can discuss this at the RFP stage.
- Adam: yes, Bryon will return and discuss the PROST at a later meeting.
- David 1: Will the 30% allocated from 2C be recurring annually?
- Jeff: Yes, but haven't decided what the cap will be.
- David 2: Wayfinding? Will signs for the trails be new, replacing the old signs?
- Ember: No, not part of the wayfinding funding but similar signs will be installed in as a 2025 CIP or if a small quantity operational.
- David 3: Update on our Boulder County request?
- Ember: There are two processes, one is a grant program and OS was not prepared to apply this year. The second process is like what was seen in the past with the annual request. She can submit the existing program again. The dates for the meeting will give us more time to prepare.

7. 7:15 pm Board Updates (5 Minutes)

Setting up who will be the secretary for upcoming meetings.

June- Andrew
July- Brad
August- Mark

Tiger Team- Grants –

- Jessamine: Started a database and created a library for the staff. Received a lengthy list of resources from Helen Moshak, which is very helpful. Andy mentioned that Helen was advocating the idea to hire a grant writer for the City of Louisville. It would be useful to have one to work with us.
- The team has a list of names as references and will continue to research. Boulder County has a foundation and does give out grants.
- David; Grant for general or specifics?
- Andy: All are geared toward specific projects. They will figure out what criteria to match the specifics.
- Will create columns on the spreadsheet regarding types of grants that fit our needs and be ready for the next project.
- David: asked the public for input on leads for these types of grants.
- Responded: Justin S? recently worked in Castle Rock. Takes all Federal, state, local, private foundations grants.

OSAB Comprehensive Plan Priorities

Susan: gave out the total ranking from OSAB's previous input. Remove the points to keep it a simple ranking. This is for our information and for Rob's reference.

8. Updates from Parks, Recreation, and Open Space Department Memorial Program.

Adam:

- Due to reaching our maximum preferred number of memorial benches, trees were to be planted in the proper places. Plaques require upkeep. Those add to staff's workload. With existing memorial benches, will continue to do maintenance and upkeep. Idea is to create and transition into financial donations for specific places. No policy was set up for this type of program. Will be working with the Finance Director to create a policy and program called "In Memory of."
- Susan: Have the donations been given to Open space already?
- Adam: Believed so and not sure about the specifics; however, was aware that some for the Parks had been received.
- Susan referenced the existing PROST plan.
- Click on the link in the agenda to access the existing plan as we will be thinking about how the new plan is going to be formed and create an outlook.

9. Open Space Encroachment – Update with the City council discussion

Adam:

- Golf Course encroachment and Parks and Open Space should be included. The goal is to educate the City Council members about existing encroachment policies and receive feedback regarding how the city enforces the policy. Will present past and current encroachment and rehabilitation after using the current policies. The meeting will be rescheduled when he gets the detailed updates.
- Question from? What type of encroachment normally happens?
- Answer: Landscaping improvement along the property lines like rock beds, flowers, lawns, failure to maintain the landscaping.
- Ember: Relating to the Open space, people dump grass clippings, tree branches, and other things. These must be cleaned up before mowing to work with the wildfire mitigation plan. If you see this, report it due to the code enforcement officer. Working with the builders and construction work regarding property lines have been addressed through the ranger system via code enforcement to educate them.
- David: 10 ft rule: how to resolve this?
- Adam: contact the code enforcement officer to clarify and resolve.
- Ember: Gate to gate, social trails can be included in the document about the encroachment policy.
- Adam: The approach is different from Gate to Gate, needs to start with awareness and education and cannot allow people or businesses to do things on public property. The city needs to figure out where and develop strategies.
- Jessamine: The education outreach can be proactive, for example mailing letters with a reminder about holiday decorations and a spring reminder about dumping and mowing.

- Andy: It is important to notify the public because it is part of the wildfire mitigation program.
- Ember: Just hired a part-time worker for Ginger, who will be publicizing the cattle grazing and will provide educational outreach.

10: Proposed Revisions to the Louisville Acquisition Process

- Adam: Worked with the task force on the land acquisitions process. Adam and Jeff created a flow chart and asked us for feedback before presenting it to the city council. Three charts: First sample is what we normally do. Second sample rethinking with red boxes by showing where need to be added on the chart. Third is the streamlined process outlook.
- Analogy: If you test-drive a car you like on the lot and go home to think about it, it may already be sold when you return to the lot. This is the same process with land acquisitions, an outcome we want to avoid.
- David: Firstly, since OSAB focused on finishing the work, then at some point a member will be in the executive session meeting, which is not included on the flow chart.
- Secondly, with all the listed properties, some of them are one-time processes which can be removed.
- Thirdly, lots of factors go into the acquisition process and someone is needed who can work closely and weed out the weeds. What can we do in the middle of the sales process?
- Jeff: same as before, once we have the list, we can set up a special meeting within OSAB. Not sure if anyone from OSAB can join the executive meeting.
- Susan: For what reason?
- Jeff: Due to the number of people, the type of conversation, and the meeting itself can run long. This is a new concept for the city council.
- Susan: executive meeting for each property or all at one time?
- Jeff: Maybe it will be the whole list to review and prioritize which one to have the executive session. May take time if the list is long.
- Michiko: During the executive session, would it be helpful if we do the presentation of a location, but not be involved in the actual discussion mode? We could just give the presentation for the property and why we think it important and then we can excuse ourselves, so the city council has a better understanding of what we are looking for.
- Good idea.
- David: Apart from Louisville, can seek Boulder County's advice or use their template for this process.
- Jeff: not yet asked Boulder County but did with the land acquisitions team regarding negotiating. Boulder County and Longmont have a bigger jurisdiction, larger budgets, and plenty of staff on board.
- Ember: When OSAB was established, we did the outreach focus to develop OSAB's process of acquisition review. Once the review is done, need to figure out how to create a process.

- Jeff: The flow chart itself is more general and will not be perfect, the goal is to have us in a better position and well prepared to inform the city council to respond to a property in a timely fashion.
- David: Concern about the time lag and need to know the city council's feedback.
- Jeff: According to the chart the second right says providing OSAB an update as appropriate within the executive sessions, depending on the attorney, Jeff, and the city council members.
- Analogy with city council: like buying a house seeking how many bedrooms, baths, or playrooms.
- Adam: Our property evaluations are very thorough and very detailed. Important information into the city council annual report will be worth of education and where they can see the prioritization.
- Charles: Since we do an incredible amount of work on this already, it's better to do it biannually instead of annually since the property ranking will remain the same. It's a time-consuming process, so let's stay with a biannual process so we have time to focus on other things.
- Michiko: Question for Charles about the annual review: Can we create some efficiencies in the process because we will be able to notice something by doing annually and will be able to notice things that we might want to add and it might be easier to do that review annually because we were doing less of a review so would it be more beneficial to standardize that process on an annual basis than to do it every two years.
- Jessamine: agrees with Charles that it does take up our time and we need to focus on other areas. Michiko's point is valid and does make sense if we do this frequently and you don't need meetings because there is more of remembering the process and you don't need to put much effort into it. I prefer one year to focus on new acquisitions and one year to focus on the existing properties. Each year do a desk review with discussion instead of a field tour and alternatively, consider new properties or take other properties off the list.
- Good idea.
- Susan: One important change is that acquisitions are now a priority, and we have the funds coming in.
- David: Overlooking one of the properties that is up for sale can impact us. Having an active monitor on the properties is important since we cannot afford to wait for our next review or City Council meeting to get news about them and by then the property would likely be sold. It is a tight process. The acquisitions fund represents about \$300,000 per year, which means we'd have enough about every three years to purchase a smaller property. However, grants and bond issues can help us. We need to consider a more efficient process with a good connection with the property. Wondering if we have an example of a good acquisitions strategy since there have been zero open space acquisitions in the past seven years.
- Andy: Is the list being completed or there is more out there. Can use the top 20, then prioritize where we really want properties. Some on the list would never be available, but at least they would be on our priority list.
- Brad: felt the list is a good solid start, and we can add a smaller list on smaller properties.

- Susan: have the property in mind and then ask for grants. According to the chart the city manager can engage with the owners.
- Adam: good open discussion about availability currently and near future. Give notice of purchase if available and possibly to award to us. GOCO preserves the property working together with the respective agencies. For example, consider the Colorado Springs success story and how they worked with GOCO.
- Michiko: back to David's comment, with the land identified for acquisition, how can we expedite an OSAB meeting to evaluate?
- Jeff: Can go ahead and set up a meeting within four or five days max given the need for public notice. Can figure out the board member's schedule, then arrange a meeting. While this chart is not perfect, he suggested focusing on taking the first step by having a conversation with the city council and seeing where that goes and seeing what happens.
- CORA requires us to write a memo to the city council and this idea from Michiko has just to present to the city council and that step is a better way to be approached.
- Mark: wondered about the criteria if we did this process.
- Susan said yes, it is
- Jeff: Describe your current process.
- Biannually in the summer, OSAB tours potential properties, meets to create the ranking by October, submitted in February this year.
- Jeff: Better to submit before the final budget in January to have the amendment for the budget in OSAB.
- Budget council retreat in July, before March capital project, April to May, operational budget.
- Andy: How to have a good process? Will never know when the property is up for sale. Once we find it and then ask for the budget then go through lengthy negotiations. Should separate the list from the budget.
- Jeff did tell the departments and directors not to make any decision at their level about what the city can or can't afford. It is the city council's responsibility to figure out the budget, not the departments.

Five-minute break....

11: Update: Trail review to OSAB regarding RedTail Ridge

- Bryon is the planning and project manager for Redtail Ridge: brief update on proposed trails map.
- Jeff: This type of process is vague for everyone. Complicated.
 - Explained the quasi-judicial role of OSAB and PPLAB, City council believes OSAB and PPLAB have a quasi-judicial role. The City attorney is drafting a clarification on the ordinance for us which will be presented on July 16 with the City council. Our role in this process is to act like a judge to hear both sides and

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ask for clarification and make recommendations upon the information presented to us, including public comments

- Adam: With Bryon, we are in the referral stage of this process, where we are reviewing one part of the development plan and providing comments back to the developer who will consider our feedback . As one part of the process they will give us the documents for review, and we will get feedback from the developer. This is not an action item tonight. For the June meeting to include our acknowledgement to them there will be an action item related to the approval or referral comments to be included in the packet of information from the community development director back to the developer.
- Questions tonight should be deferred to the June meeting. Jessamine: comment on the process. When we had the joint meeting with the City council, if we are part of the quasi-judicial process, we need to be given some training. Jeff's advice tonight is helpful, however, in our prior experience with this project, we have been given direction to not say anything with the same meeting where we are voting about what part of the code we should be considering without any advance packet material. If we are not going to receive formal quasi-judicial training, I would ask the staff to work as hard as possible within the uncertain time frame at least for us to understand the context in which we make a decision. In certain aspects, we don't have enough time to understand or study the code and it is uncomfortable for us to go ahead and vote.
- Jeff: Can we move the vote to July instead of June? In June, the city clerk, city attorney, and I will provide video training available on the city website so it can be accessed at any time. Per Bryon, Trails has the first public works deadline coming upon July 19. OSAB's meeting is on July 10. We all agreed we would be open to a special session to meet the necessary deadline.
- Bryon: just wanted to focus the overall review process with clarification. Confusing to see what is happening and what is not. Looking at the trails component, he is not the expert but will try to answer the questions. It is not a formal motion, and he is just getting comments from us.
- Three basic steps: review, referral, council approval process.
 - Preliminary plat, second is final plat and lastly is PUD. In the preliminary plan, a map that shows the total parcel will get subdivided into multiple smaller parcels and will show individual ownership. Where we are now is the second step of the final plat.
 - Subdivision improvement agreement (SIA). reviewing construction drawings. Public works gets the construction drawing from the developer, then will analyze the documents in a first initial review and voice their concerns. The staff will be making recommendations, and the council would potentially approve the final plat. PROST is involved in this process. Their role is as a referral agency, gathering all the comments from BVSD, police, fire, Northwest Parkway, and the list goes on. These comments will be passed on to the developer to revise their plans. We will have a time frame to provide comments back to them.
- This process is very much a cyclical process.
- Here is the plot map: dark green shades (l) land being dedicated to the City of Louisville as open space. Tract B may be a potential future park parcel. The light green now c a Boulder County as a conservation easement will go to the City of Louisville for open

space. The bottom section belongs to Broomfield. The yellow overtone in the center of the map represents parcels that I can be subdivided into different tracts that will determine the roads. The developer will be coming back to the city parcel by parcel for PUD review and approval, Will look at the development and most often in this process, will be engaging back and forth with the PUD process. There is no plan for PUD in the yellow areas.

- Looking at the map with trails, the little red boxes with suggestions for reviewing and comment process will be given to the developer.
- “Detached” means the sidewalk is separated from the road by a planted strip to create a buffer to avoid the feeling of the upcoming traffic rushing by.
- Underpass will be plowed therefore the change from soft gravel to hard surface.
- Question came up with the connection with future natural areas into the parcel area. Do we want those connections or not?
- Ember: asking about parking for access to the trail and how to figure out the process to clarify whether there will parking there or not
- Bryon: There are a few challenges because the PUD is not connected to the final plat. The final plat can be approved, then the PUD. However, there is no real commitment, and the plot could be sold to another developer, potentially leading to a new PUD. There is a possibility to identify future trail connections that could be part of the PUD depending on the trail then needs to be built back to the open space.
- Ember: correct wanted to know if this will happen or not.
- Bryon: will add the staff comments about the connectivity. Now next to the overpass on the Northwest Parkway (Broomfield) to Redtail Ridge. Expect students and workers to need safe access between their homes east of the Parkway to Monarch and Redtail Ridge.
- Michiko: Question for workers not the students?
- Bryon: both
- Michiko: Those who live in Broomfield are required to do open enrollment for Monarch, which has an enrollment cap.
- Bryon: for people who work there and potentially students.
- Andrew: How would bikes access an overpass?
- Bryon: good question, must have access according to the ADA, ramp, or elevator, haven't seen the plan. Make sure the developer follows the ADA requirements.
- The overpass is a huge project, as would be an underpass option. Have one underpass trail leading nowhere.
- Bryon: will be connected via blue line
- Have already seen paths that are not showing on the map.
- Bryon: Parkway authority must have the overpass due to their safety concerns about people crossing over the south part of the Parkway via a pedestrian crossing.
- Broomfield believes an overpass is the better option. If the Jefferson parkway is completed, it will generate more traffic.
- Bryon: Big question is how to connect the trail along 96th Street or the Northwest Parkway. There may be a new Bromfield park called Vera Park, creating a trail over 96th or through the park. The request was made to build an off-site trail along 96th, which

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would be an improvement not shown on the previous map. New overpass to school will be plowed and the underpass would be soft surface.

- Build a new connection from the underpass on Campus Drive to go up to the street level for plowing purposes. Requesting for the connection or any additional connection to the trail the school to be more efficient.
- Comments will be formalized in the document package for June or July. Since July is packed, just wanted us to have the time to review and get ready for June or July.
- Susan: Group visitation to Redtail is not allowed due to legal reasons, but a site visit would be very helpful. The board supported it and made a formal request to do so.
- Jeff: the quasi-judicial nature of the issue and the need to have a clear record of all kinds of conversation will be the city attorney's concerns. There is a 5–10-minute drone video of the property available.
- Michiko: Would it be possible to have two-person tiger teams visit the site? Good question will ask.
- Jessamine: 8ft hard surface – yellow, connecting to purple is that the end of the trail. Bryon: purple is a 6-ft sidewalk. The northern part is a 10-ft wide trail. This is important for the city's maintenance responsibility.
- Charles: S-shaped dotted red line leads to the underpass connecting to school, the pavement is in the middle of open space. in that location would prefer soft surface. Since it will be paved due to snow plowing needs for students, it would be better to move the trail to the western side toward the road area instead of in the middle.
- Michiko: Asking about the determination that there will be an underpass, can they change that later to an overpass or it is set in stone? I have two concerns: Given that E-bikes will be hauling through underneath toward the schools and kids tend to zoom as well, there should be a consideration for safety. The developer must be made aware of this.
- Jeff: quick reminder—the goal is for Bryon to provide a short update at this meeting. He can't answer our questions now, but referral comments will be in the June or July packet.
- Andy: want to clarify the relationship process with the red dots, the developer says too costly then what to do?
- Bryon: the construction drawings are approved by public works as part of their permit. If they don't meet the requirement of the city or city engineer, they can deny the permit. Dealing with all the different departments and outside agencies, trails are part of the preliminary plat process. The concept of our referral saying no, I don't approve of this then the city engineer will feel uncomfortable making recommendation at the final plat plan and recommend to the city council not to approve. Having the timeline, his discussion will be going back and forth and more of a negotiation process. Will create more reviews and discussion. This will go through a repeated cycle.
- Looking at the next step, gathering of those comments from reviews on the construction drawings with the trails component will be presented back to us.
- Regarding grading, the city council requested a delay of four months back in February, so grading will start in June. Trails on the PUD parcels will begin shortly thereafter.
- Susan: There will not be grading on open space, correct? My concern and the reason city council delayed grading for four months was to allow open space to remain in a natural setting.

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- Bryon looked at the plans closer. I is labeled as open space and parcel B is a park tract. It is my understanding that the grading on I will only be for the purpose of trail construction.
- Charles: trails are not yet decided, and the possibility to go ahead to push a 12-foot-wide trail is premature.
- Bryon: The importance of the timing is now for us to approve or not. I was not there, but it's my understanding that OSAB approved it two years ago in the preliminary plat. ? Charles' feedback is not about the alignment, just concerns on which trails have hard or soft surfaces.
- Bryon: it is important to collect those comments and will get them back to you as soon as possible.
- Lastly, it is very vague, the final plat goes back to the city council for approval around late fall
- Andrew and quasi-judicial review: one specific part creating more studying or comments, for example either underpass or overpass, based on the decision we think is good for the community, which doesn't work for us as a quasi-judicial process.
- Bryon: referral process, PROST does not have decision-making authority on the project, City council has the decision-making authority based on the recommendations from the planning department and the public works department considering recommendations from OSAB, PROST, and PPLAB. We can provide suggestions and feedback.
- David: One thing is missing: the underpass at Rockcross that we had suggested earlier. Two options were there and just disappeared in this version. It is very important for the north and south corridor – campus drive to Hwy 36 – given safety concerns in this heavy traffic area. Will suggest it again. Why are there three separate trails with two different trail widths around the lake? This area needs to be cleaned up.
- Bryon: It is about the user experience in the open space. Can change 12 feet to 10 feet wide. Needs to give feedback tonight.
- Jeff: not tonight, just listen to the update and Bryon is taking notes and OSAB board members will be giving formal feedback in the next meeting.
- David: The fact is, it is not on the map showing tonight and someone deleted it. To me it feels biased when the staff does not agree with OSAB board members. Thus, for me to go straight to the developer will be creating conflict between us and the staff. We need to agree with the staff. I am confused and can you tell me why the underpass is not on the chart/ map.
- Bryon: I can't answer that question since I was not there.
- David: I am trying to understand the process, felt like waiting too long and missed the opportunity.
- Bryon: thinks that the process on the project is a one-person opinion made in a staff's recommendation that the council can say thanks or no thank you. There are several ways things have been happening during the process. So that specific underpass, I don't know the history or why it got removed. At the next meeting will make a formal comment.
- Jeff: Rob and Karen will be at the next meeting, and they may have more information.

- Michiko: asking about the detached sidewalk leading to 88th and campus drive. Will there be sidewalks or improvements alongside the memory care facility to create trail connectivity? What is the plan dealing with the red dotted line?
- Bryon: drawing there is a portion that is not currently detached, the section from Campus Drive to that dotted line is already detached, then there is a rough approximation of where the new detached trail would be connecting and extending.
- Michiko: Lastly, wayfinding: Should there be a tiger team to work on any of those trails and wayfinding signs?
- Bryon: (Looking at Ember), understand that the wayfinding for the primary trail' corridors *88th) would be a separate wayfinding effort or project.
- Ember: added along with 'David's comment that we might put out signs matching the wayfinding component would separate more of the property name.
- Public Comments
- Tamar Krantz: will OSAB decide in the next meeting, looking back at the chart with different properties that will be maintained by the city? She has concerns relating to the operations budget. Can you clarify who is responsible for what areas, Open Space, Parks, and the Metro District.
- Wildlife: Will there be wildlife corridors? Will OSAB be responsible for running over the animals?
- Bryon: the maintenance responsibilities will be outlined in the subdivision improvement agreement, which will have its own layer of review from the planning department. Based on the draft you have seen, which is from the staff, we need to clarify who will be responsible for what properties and have the actual physical identification in the field.
- Will that be in the OSAB review meeting or not?
- Bryon: Not yet discussed. SIA will bring it to OSAB later. Will have a referral discussion with SIA. Will be relating to construction drawings.
- Michiko: 12-ft trail width with hard surface meaning what? And what is the purpose of having a specific width? Is this design for bikes to go over 30 miles per hour to run over people?
- Bryon: (looking at Ember). The width is based on the volume of traffic there and the need to allow users to pass each other. Public Works has seen that 12 ft is the more standard commuter, multi-use, share-the-road design. I think it is a part of the transportation master plan, which is already established.
- Sherry Sommer (public comment): asking about the Metro District, figuring out on the calculator, seems like a 21% reduction for the funding the district is asking for. Would be beneficial to know how the Metro District funding is analyzed. Including the debit for grading as well. OSAB saves more during the PUD level. The underpass situation (third) she felt the developer will reject it and the council will accept their word. Concern with wildlife and wanted to make sure the developer's data is valid.
- Bryon: with wildlife, my understanding is the city of Louisville doesn't have any ordinances that require the developer to do certain things or not with wildlife. Don't have any ordinance requiring studies. However, they must follow both state and federal level regulations.

- Susan: updating the next meeting agenda. Will add the packet from the planning department.
- Ember: Removing agenda items, A and B, which have a person already scheduled to present for 15 minutes; LOSA can be moved to August.
- David: will be out of town in June and can call in.
- Michiko: asking if Jeff, Adam, and Bryon will be back in June?
- Ember: TBD needs more internal discussion.
- Charles: June will have fewer agenda items since we don't know what will be added to it.
- Michiko: quasi-judicial training in June in effect?
- Jeff: TBD
- Andy: clarification with voting, to provide feedback with revision or is there a separate set of comments while we are giving feedback formally not voting.
- Bryon: Actually, voting on the recommendations. In the OSAB group vote on the recommendations and add anything wanted to document. Once voted it will go to the city council formally.
- Ember: Historically, the staff provide full staff comments, OSAB will go through the comments approving, disapproving, and add more comments. The staff will take the recommendation and some revision to go forward. However, if there is a disagreement between the staff and board, both of their recommendations will be incorporated into the documents.

12: Discussion items for the next meeting June 12, 2024

- Strategies for Protecting Habitat, Steve Jones, wildlife consultant
- Glyphosate and Prescribed Fire use in pilot projects

13: Adjourn 9:30pm

MEMORANDUM

To: Open Space Advisory Board
From: Open Space Division
Date: June 12, 2024
Re: Information Item 6: Staff Updates

General:

1. Staff has selected a candidate for the Open Space Maintenance & Trails Position and have provided them with an offer letter. The response deadline is by the end of the workday on Monday, June 3rd, 2024.
2. Staff has selected a candidate for the Open Space Manager which is pending acceptance.

Natural Resources:

1. Fire Presentation updates
 - a. Nathaniel Goeckner, Natural Resource Supervisor, presented at the Front Range Grassland Fire Workshop on May 29th. This was the first year of the conference and was organized by several Front Range partners including: the Great Plains Fire Science Exchange, Southern Rockies Fire Science Network, Colorado State Forest ice, The Watershed Center, Boulder County, and Wildfire Partners
 - b. <https://www.southernrockiesfirescience.org/event/front-range-grassland-fire-workshop/>
2. Hecla Pocket Prairie Installation
 - a. The entire Open Space team was able to prepare, install and plant a pocket prairie on the northwestern side of Hecla Lake
 - b. Planting is a representation of species of grasses, forbs, and shrubs that are found historically in the area of Louisville
 - c. Staff is working with Marketing team to post a plant list with information for the public
3. Goat and Cattle Grazing
 - a. Cattle have finished grazing at both North and Davidson Mesa for the spring grazing season; cattle were prescribed to graze at higher utilization rates in introduced cool season grass stands to add pressure to exhaust the species
 - b. Goat Grazing (browsing) Goats have finished up at Dutch Creek Open Space, where they were grazing on noxious weeds, and cool season grasses; goats also browsed on ladder fuels, lower limbs and invasive woody species

- c. Total of 16.8 acres grazed by goats and 91.6 acres by cattle
- 4. The American Kestrel box with the camera is active this season and five chicks have hatched. Staff and the Colorado Avian Research and Rehabilitation Institute have been checking other kestrel boxes throughout the season and three other boxes are active so far this season.
- 5. Weed control:
 - a. The herbicide contractor will be working on select Open Space properties during the weeks of June 4-7 and June 11-14.
 - b. Staff released biocontrols to help control spotted knapweed on Daughenbaugh.

Maintenance & Trails:

- 1. Staff has been conveying water to the Harney Lastoka agriculture tenant since May 23rd, 2024. The planned timeline for this task is to continue running water until June 13th, 2024.
- 2. Staff has submitted the Trails and Acquisition Request to Boulder County identifying potential opportunities for future trail and acquisition priorities. The submittal was identical to the OSAB and Council approved 2023 submittal.
- 3. Trail corridor mowing is first priority for the Open Space seasonal staff. The concrete trail corridors have been mowed at least once so far and staff is moving on to soft surface trail corridors at the present moment.
- 4. Staff has installed fishing line receptacles at Warembourg fishing pond and Harper Lake to collect used fishing line and recycle it. Please see materials following staff updates.
- 5. Staff has begun installing the new wildlife friendly trash cans throughout the Open Space network to update amenities and improve staff efficiency.
- 6. Staff will be hosting an event for National Trails Day on June 8th 2024 at Harper Lake Open Space. The event will run from 9 am to 2 pm and will consist of repairing and resurfacing the 4-foot pedestrian trail around the northern side of the lake.
- 7. Staff will begin the process of filling the Warembourg Fishing Pond via the Goodhue Ditch on June 4th 2024.
- 8. Staff partnered with the City of Boulder's OSMP department for an Accessible Trails event on May 25th 2024 at the Daughenbaugh and Warembourg Open Space properties. The event consisted of participants being able to try adaptive bike styles. These specialized bikes are built to be adaptive to those with mobility challenges to experience cycling again, regardless of disability status. With the success seen at this event, staff is in the planning process to create similar future events.
- 9. Staff met with 104th Street Trail partners to discuss how to jointly maintain the trail this season with consideration to the approved IGA.

Resource Protection:

1. Ranger Meili participated in Ranger Excellence School from 5/13/2024 to 5/17/2024 and acquired a Certified Interpretive Guide endorsement.
2. Rangers launched their trail etiquette campaign in collaboration with the PROS Senior Marketing Specialist. At the first four booth locations have brought more than 160 attendees.
3. Enforcement case load remained high through May as rangers worked to extra-patrol areas where grazing contracts were taking place.
4. Fishing-related contacts remain high, likely due to increased fishing use of Harper Lake after CPW stocked the pond in late April.

Education Events Upcoming:

1. Thursday, 6/13/2024 from 10:00 AM to 12:00 PM, Noxious Weed ID Booth on Davidson Mesa Open Space.
2. Saturday, 7/6/2024 from 8:00 to 10:00 AM, Pulling for Louisville-Davidson Mesa at Davidson Mesa Open Space.

Education Events Past:

3. Saturday, 5/11/2024 from 9:00 to 9:45 AM, Bullfrogs and Biodiversity at Hecla Lake Open Space. 1 participant.
4. Saturday, 5/18/2024 from 10:00 to 10:45 AM, Noxious Weed ID at Aquarius Open Space. 15 participants.
5. Saturday 5/18/2024 from 11:00 AM to 12:00 PM, Pulling for Louisville-Aquarius at Aquarius Open Space. 4 participants.
6. Sunday, 5/19/2024 from 8:00 AM to 10:00 AM, Aquarius Lightning Tree on Canvas (Open Space Plein Air Series) at Aquarius Open Space. 3 participants.
7. Thursday, 5/21/2024, from 5:00 PM to 7:00 PM, Grassland Walk at Davidson Mesa Open Space. Cancelled due to inclement weather.
8. Saturday, 5/25/2024 with 3 session times: 10:00-11:00 AM, 11:00 AM -12:00 PM and 12:00-1:00 PM, Adaptive Bike Ride/Accessible Trails at Daughenbaugh Open Space. 10 participants.
9. Saturday, 6/1/2024 from 2:00 to 4:30 PM, Free Fishing Weekend at Harper Lake Open Space. Not available at time of publication.
10. Sunday, 6/2/2024 from 5:00 to 7:00 PM, Fishing Pond on Canvas (Open Space Plein Air Series) at Warembourg Open Space. 9 participants.
11. Saturday, 6/8/2024 from 9:00 AM and 2:00 PM, National Trails Day at Harper Lake Open Space. Not available at time of publication.

MEMORANDUM

To: Open Space Advisory Board
From: Open Space Division
Date: June 12, 2024
Re: Information Item 7: Fishing Line Recycling Program

Whether intentionally or accidentally discarded, fishing line can be a silent killer of wildlife.

In a proactive move to mitigate the harmful effects of discarded monofilament fishing line on wildlife and the environment, the City of Louisville is excited to join the BoatUS Foundation's Reel In and Recycle Program. This initiative has empowered anglers nationwide to safely dispose of over 20,000 miles (and counting) of fishing line.

Specially designed recycling containers aimed at collecting plastic fishing line are now conveniently placed at the City's three fishing areas: Harper Lake, Lake Park, and Warembourg Fishing Pond.

Anglers are urged to contribute by gathering any used fishing lines they come across, whether their own or discarded by others, and depositing them into the designated recycling tubes. It's important to remove all bobbers and hooks from the line before recycling. Please do not place trash or other items in these containers.

City staff will regularly empty the recycling containers and send the collected fishing line to Berkley Fishing in Iowa, where it will undergo processing and repurposing. In addition, ongoing shoreline clean-up efforts will continue.

By taking proactive steps like these, the City of Louisville reaffirms its commitment to environmental stewardship and encourages its community members to play an active role in preserving the natural beauty of their surroundings. Monofilament fishing line takes roughly 600 years to break down, so by doing your part, you're not only keeping our waters clean but also protecting wildlife and preserving the beauty and health of our lakes for generations to come.

SAVE OUR WILDLIFE!

RECYCLE USED FISHING LINE AND TACKLE HERE

PLEASE NO GARBAGE, HOOKS, OR BOBBERS!

PROTECT HABITAT
 Please help keep our wetland habitats healthy by properly disposing of fishing line and tackle.

PROTECT WILDLIFE
 Each year, thousands of animals are injured or killed as a result of improperly discarded fishing equipment.

MAKE A DIFFERENCE
 More than 20,000 miles (and counting, thanks to you!) of fishing line has been disposed of safely because of programs like this!

DISPOSE OF YOUR FISHING LINE PROPERLY
 Discarded fishing line can injure and kill wildlife.

DESECHA TU LÍNEA DE PESCA CORRECTAMENTE
 Las líneas de pesca desechadas pueden herir y matar a la fauna.

New Fishing Line Recycling Program!
 In partnership with BoatU.S. and Berkley, your fishing line can now be recycled.

BoatUS **Berkley**

Thank You for Fishing Responsibly

City of Louisville

This Canada goose was found in Louisville with a discarded lure stuck in its wing.
 Esta ganso canadiense fue encontrado en Louisville con un señuelo de pesca atascado en su ala.

Discussion Item 8: Review A Draft Ordinance Amending and Clarifying OSAB's Role Related to Quasi-Judicial Matters

**ORDINANCE NO. XXX
SERIES 2024**

AN ORDINANCE AMENDING CHAPTERS 2.20 AND 4.02 OF THE LOUISVILLE CONCERNING THE QUASI-JUDICIAL ROLES OF THE OPEN SPACE ADVISORY BOARD AND THE PARKS AND PUBLIC LANDSCAPING ADVISORY BOARD

WHEREAS, the City previously created and established an Open Space Advisory Board (OSAB) and a Parks and Public Landscaping Advisory Board (PPLAB), which serve in an advisory capacity to the City Council; and

WHEREAS, City Council desires to formalize and clarify the quasi-judicial roles and responsibilities of the OSAB and PPLAB with respect to land development application review.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. Chapter 2.20 of the Louisville Municipal Code is hereby amended by the addition of a new Section 2.20.080 to read as follows:

**Chapter 2.20
Boards and Commissions**

Sec. 2.20.080. Parks and Public Landscaping Advisory Board.

A. There is created and established a Parks and Public Landscaping Advisory Board for the City.

B. The Board shall consist of seven members, each of whom shall be appointed by the City Council. The qualifications, terms, and other matters respecting membership of the Board shall be set by City Council resolution.

C. The members of the Board shall serve in an advisory capacity to City Council, and shall have principal responsibility for matters related to parks and public landscaping. The powers, duties and responsibilities of the Board shall be set forth in this section and by City Council resolution.

D. Development application review.

1. The Board shall review:

a. Preliminary and final subdivision plats that include public use dedications or cash in lieu of public use dedications pursuant to Section 16.16.160 of the Code or

Discussion Item 8: Review A Draft Ordinance Amending and Clarifying OSAB's Role Related to Quasi-Judicial Matters

public.

b. Land development applications that include streetscape landscaping in new development.

2. The intent of the Board's review is to advise the Planning Commission and City Council on those parts of the land development application related to:

a. Park development within the project boundaries, including the preferred locations for parks and whether the application meets the criteria for park development set forth in the City Code and other City-adopted policies;

b. Development of trails and trail connections;

c. Infrastructure or improvements relating to parks;
and

d. If the application does not include a park dedication, the Board may recommend that the application be revised to include a park element.

3. The Board shall conduct a public hearing in connection with its review of land development applications. Public notice shall be provided in accordance with Sections 16.04.070 of the Code. The Board shall act as a quasi-judicial body in the conduct of the hearing.

4. After the public hearing is concluded, the Board shall adopt a resolution making findings concerning the matters set forth in this Section and recommending approval, approval with conditions or denial of the application.

Section 2. Chapter 4.02 of the Louisville Municipal Code is hereby amended by the addition of a new Section 4.02.050 to read as follows:

Chapter 4.02 Citizens Open Space Advisory Board

Sec. 4.02.050. Development application review.

A. The Board shall review development applications that include proposals for public use dedications, cash in lieu of public use dedications, or public or private common open space. Specifically, the Board shall review:

Discussion Item 8: Review A Draft Ordinance Amending and Clarifying OSAB's Role Related to Quasi-Judicial Matters

1. Preliminary and final subdivision plats that include public use dedications or cash in lieu of public use dedications pursuant to Section 16.16.160 of the Code.

2. Preliminary and final PUD applications that include a proposal for open space pursuant to Section 17.28.080 of the Code.

3. Preliminary and final PUD applications that include a proposal for open space as part of a waiver request pursuant to Section 17.28.110 of the Code.

B. The intent of the Board's review is to advise the Planning Commission and City Council on those parts of the land development application related to:

1. Open space development within the project boundaries, including the preferred locations for open space and whether the application meets the criteria for open space development set forth in the Charter, City Code and other City-adopted policies;

2. Development of trails and trail connections;

3. Land management standards for private common open space;

4. Infrastructure or improvements relating to open space;
and

5. If the application does not include an open space dedication, the Board may recommend that the application be revised to include an open space element.

C. The Board shall conduct a public hearing in connection with its review of land development applications. Public notice shall be provided in accordance with Sections 16.04.070 and 17.04.070 of the Code. The Board shall act as a quasi-judicial body in the conduct of the hearing.

D. After the public hearing is concluded, the Board shall adopt a resolution making findings concerning the matters set forth in this Section and recommending approval, approval with conditions or denial of the application.

Section 3. Section 4.02.040.D of the Louisville Municipal Code is hereby amended to read as follows (words added are underlined; words deleted are ~~stricken thorough~~):

Discussion Item 8: Review A Draft Ordinance Amending and Clarifying OSAB’s Role Related to Quasi-Judicial Matters

Sec. 4.02.040. Ongoing duties.

D. The board shall provide comments to the Council and/or Planning Commission on development applications as provided in Section 4.02.050. ~~proposals for land immediately adjacent to, or materially impacting, open space lands providing the comments are provided during the standard referral timeliness established for the city's development processes. Staff will coordinate providing the board with information on pending issues to provide the board a timely opportunity to provide such comments as part of the established planning process.~~

Section 4. If any portion of this ordinance is held to be invalid for any reason, such decision shall not affect the validity of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance and each part hereof irrespective of the fact that any one part be declared invalid.

Section 5. The repeal or modification of any provision of the Municipal Code of the City of Louisville by this ordinance shall not release, extinguish, alter, modify, or change in whole or in part any penalty, forfeiture, or liability, either civil or criminal, which shall have been incurred under such provision, and each provision shall be treated and held as still remaining in force for the purpose of sustaining any and all proper actions, suits, proceedings, and prosecutions for the enforcement of the penalty, forfeiture, or liability, as well as for the purpose of sustaining any judgment, decree, or order which can or may be rendered, entered, or made in such actions, suits, proceedings, or prosecutions.

Section 6. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED this ____ day of _____, 2024.

Christopher M. Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

APPROVED AS TO FORM:

Discussion Item 8: Review A Draft Ordinance Amending and Clarifying OSAB's Role Related to Quasi-Judicial Matters

Kelly PC, City Attorney

PASSED AND ADOPTED ON SECOND AND FINAL READING, this _____ day of _____, 2024.

Christopher M. Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

June 4, 2024

To: Open Space Advisory Board
From: Bryon Weber, PROS Project Manager

Re: Discussion Item 9: Redtail Ridge Construction Drawings – Trails

Following the staff update provided at the May 8, 2024 OSAB meeting, staff welcome board comments and suggestions pertaining to the latest iteration of the trail and sidewalk plans for Redtail Ridge as part of the City's development review referral process. A map is attached to reference site locations corresponding to various Staff comments.

Comments received from the Board will be included with PROS Staff comments sent to the City's case manager – in this instance the City Engineer. As with all development review and construction document referrals, Board and PROS Staff comments will be taken into consideration during the project's approval and permit process as seen fit by the project's case manager.

A draft of staff comments to be submitted to the case manager is provided below for board review.

Based on review of materials submitted for the above mentioned referral, The Parks, Recreation & Open Space Department has the following comment items:

- 1) Staff support developing a fully detached concrete walkway on the east side of 88th between Campus Drive and Rockcross Drive.
- 2) Staff support modifying the trail surface from crusher fines to concrete for the portion of trail on Tracts I & B which connects Rockcross Drive to the proposed school underpass (see item 3) for the purpose of creating a plow-able route from the SW corner of the development to the BVSD school property. A minimum of one new trail/walk connection on the north side of the proposed underpass on the BVSD property should therefore also be concrete.
- 3) Staff support creating a safer crossing of Campus Drive near the Boulder Valley School District's property by installing an additional pedestrian underpass at Campus Drive instead of an at-grade crosswalk.
- 4) Staff do not support development of two trail connections shown on Parcel I which connect to the west side of parcel PUD 3 as currently shown. Staff suggest including these potential connections as part of the review process for PUD 3 if/when submitted.
- 5) Staff suggest adding an additional hard surface trail connection on Tract C to more efficiently connect the easternmost Campus Drive underpass up to the sidewalk on the north side of Campus Drive. The trail connection should be concrete to establish a plow-able route from the east side of the development to the BVSD property. The portion of trail from the northern portal of the easternmost underpass to the new connection should be changed from crusher fines to concrete.
- 6) Staff support the installation of a pedestrian bridge over the NW Parkway to better connect the development to the City of Broomfield. Staff support sidewalk/trail

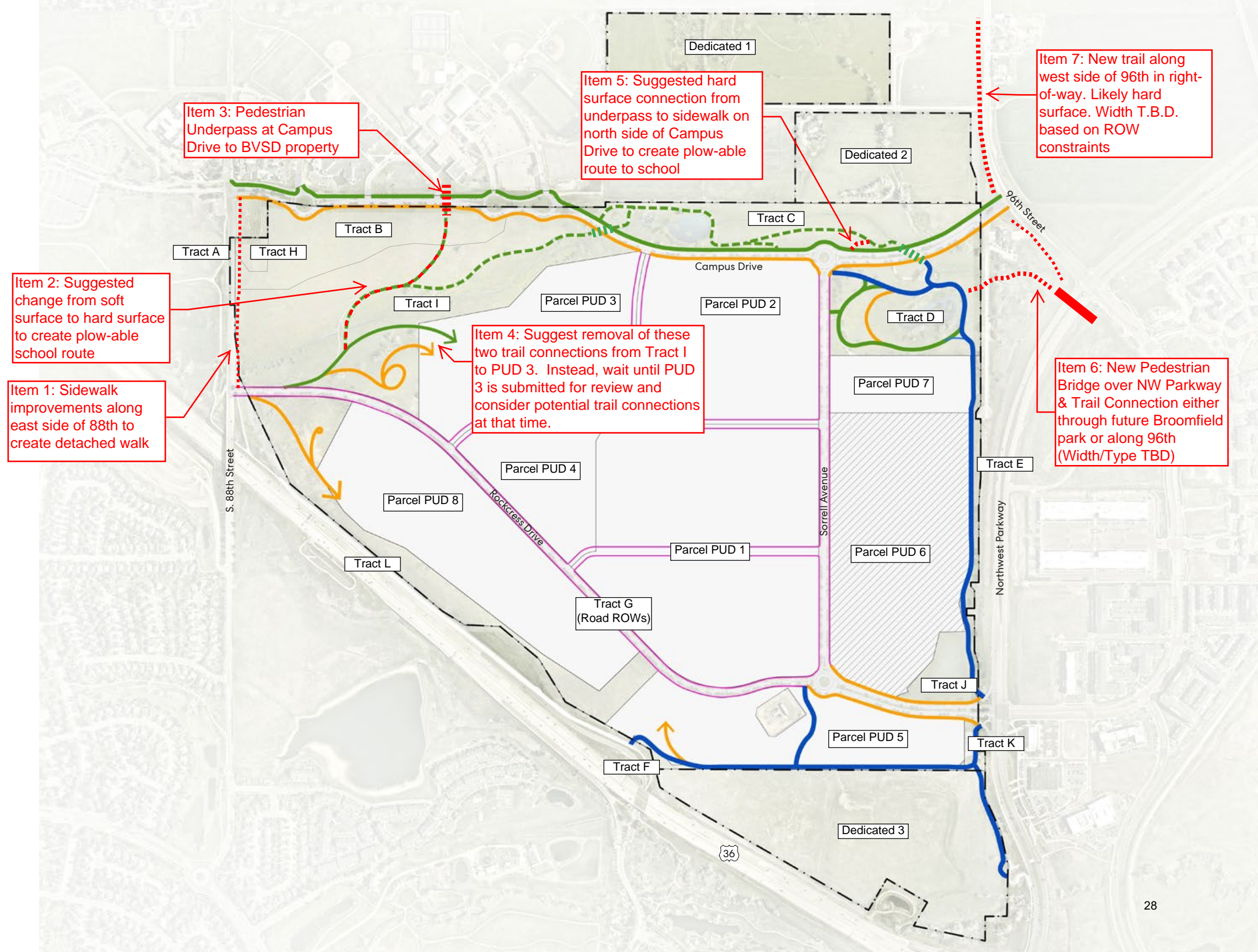
connections from the proposed bridge along the west side of 96th and/or through the future City of Broomfield Varra Park. Staff suggest one connection at minimum be 8' width concrete to enable a plow-able pedestrian route from the bridge's north/west side to the development's overall sidewalk/trail system as currently shown.

- 7) Staff support the development of sidewalk/trail connection on the west side of 96th to connect Campus Drive to W Dillon Rd. Staff prefer the trail is detached from the roadway for safety and a better user experience.

Trail Surfaces & Widths

All comments shown in RED indicate on-going discussions as part of the final plat and/or construction document review. No decisions or agreements have been made regarding implementation. All are subject to change.

- 12' Width, Hard Surface Trail
- 10' Width, Hard Surface Trail
- - - 10' Width, Soft Surface Trail
- 8' Width, Hard Surface Trail
- 6' Width, Hard Surface Trail



Item 3: Pedestrian Underpass at Campus Drive to BVSD property

Item 5: Suggested hard surface connection from underpass to sidewalk on north side of Campus Drive to create plow-able route to school

Item 7: New trail along west side of 96th in right-of-way. Likely hard surface. Width T.B.D. based on ROW constraints

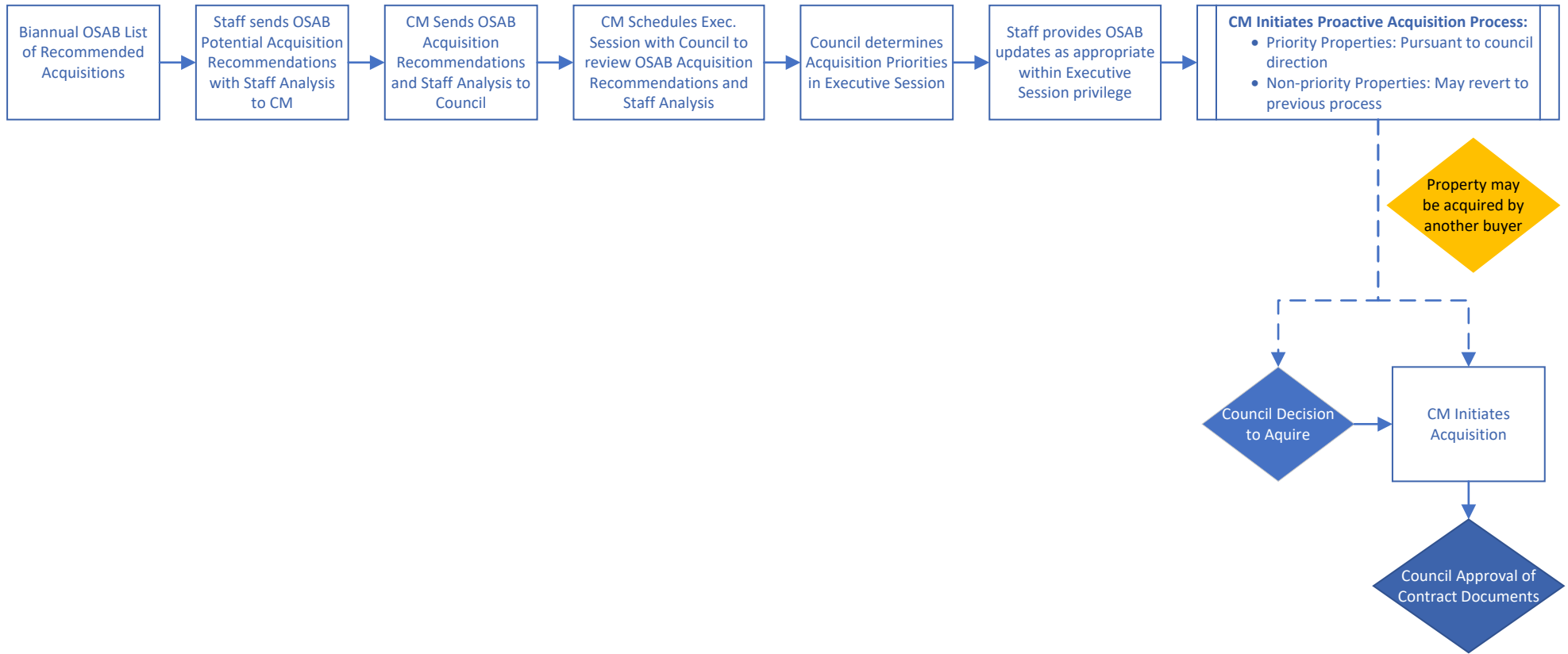
Item 2: Suggested change from soft surface to hard surface to create plow-able school route

Item 4: Suggest removal of these two trail connections from Tract I to PUD 3. Instead, wait until PUD 3 is submitted for review and consider potential trail connections at that time.

Item 1: Sidewalk improvements along east side of 88th to create detached walk

Item 6: New Pedestrian Bridge over NW Parkway & Trail Connection either through future Broomfield park or along 96th (Width/Type TBD)

Proposed Open Space Acquisition Process



MEMORANDUM

To: Open Space Advisory Board

From: Nate Goeckner, Natural Resource Supervisor

Date: 6/5/2024

Re: Action Item 12- OSAB Review of Potential Use of Glyphosate and Prescribed Fire as Part of Small Isolated Research Plots

Purpose:

Staff is proposing use of glyphosate and prescribed fire to be included in two different studies that will be occurring on Open Space this year.

Smooth Brome Study: Staff is proposing that Open Space staff are allowed to use glyphosate in two select plots, each 75ft x 75ft, on North Open Space to research the control of the introduced cool-season grass, Smooth Brome (*Bromus inermis*). This research is vital in our ongoing efforts to explore all tools and best management practices to control the abundance and prevalence of Smooth Brome. Glyphosate (Roundup) is a widely used herbicide that has been proven to be an effective way to treat noxious weeds and grasses. When applied correctly, with proper training and following label guidelines, glyphosate has less impactful interactions with water and other elements of ecosystems, making it a more appropriate selection than other herbicides.

Joint Fire Science Program Grassland Fuels Project: This proposal is a collaborative effort with the University of Colorado Boulder, led by Postdoctoral Researcher Jonathan Henn. His research focuses on understanding variability in grassland fuels across the Front Range landscape and how different potential fuel mitigation methods, including grazing, burning, and mowing, affect fuels and other important grassland functions, like plant diversity and soil health. This research, backed by the University's expertise, will be a very impactful way for City of Louisville Open Space staff to learn more about best management practices for grassland wildfire mitigation treatments and their effects on fire behavior. Prescribed fire is a widely used tool for prairie restoration and is often used as an effective and safe treatment for mitigating wildfire. Prescribed fires combust fuels like grasses, shrubs, and scrub, reducing high fuel loads that can contribute to high severity and damaging wildfires. Prescribed fires must meet several conditions (i.e., Weather, season, staffing, control lines, etc.) and planning before implementation. Prescribed fire operations use comprehensive planning to target windows where fire behavior is minimal, giving the ability to secure and control fire spread. For this study 1-2 acres would be burned.

Partners for this study would include the University of Colorado Boulder, Boulder County Open Space, Boulder County Sheriff Office, the City of Boulder Open Space and Mountain Parks, Boulder County Fireshed—Grasslands Working Group, Jefferson County Open Space, and Colorado State Forest Service.

Please see following materials for more detail.

PROPOSED - Joint Fire Science Program Grassland Fuels Project Overview

Project Summary: We are working to better understand variability in grassland fuels across the Front Range landscape and how different potential fuel mitigation methods including grazing, burning, and mowing affect fuels and other important grassland functions like plant diversity and soil health. We are combining information collected from field observations of grassland fuels, experimental implementation of fuel management methods, and fire behavior modeling to help prioritize if, when, and how fuel mitigation methods might be most effective for reducing fire risk and maintaining healthy grassland systems.

Project Leads:

- Jonathan Henn:
- Katharine Suding:

Main Municipal Partners:

- City of Boulder Open Space and Mountain Parks
 - Main contact: Chris Wanner
 - Other Contacts: Paul Dennison, Ryan Middleton
- Boulder County Parks and Open Space
 - Main contact: Erin Maier
 - Other Contacts: David Hirt, Stefan Reinold
- City of Louisville Open Space
 - Main Contact: Nathaniel Goeckner
 - Other Contact: Ember Brignull
- Jefferson County Open Space
 - Main Contact: Tanner Marshall
 - Other Contact: Steve Germaine
- City of Longmont Public Works and Open Space
 - Main Contact: Jim Krick

Other Project Partners:

- Chad Hoffman, Colorado State University/USGS, fire behavior modeling expert

Project Activities:

Grassland fuel monitoring: we are measuring grassland fuel characteristics at 90-120 plots scattered across Boulder and Jefferson Counties twice annually at peak biomass (~July) and after the growing season (~October). This may also be expanded to spring (~May) monitoring. These plots are split across the main grassland types to characterize how different soils, topography, and species composition affect fuel accumulation and done annually to capture variation in year-to-year weather and how it affects fuel accumulation. All plots are on land owned and managed by the partners (OSMP, BCPOS, JeffCo Open Space, previously also on City of Longmont properties also).

- Main lead: Jonathan Henn
 - Main lead is in charge of coordinating the field and lab work to collect biomass samples and other ancillary data
- Other contacts: Chris Wanner, David Hirt, Tanner Marshall
 - Other contacts are in charge of permitting and helping with access (keys, closures, etc.)

Experimental fuel treatments: We will implement grazing, burning, and mowing as potential fuel mitigation methods to measure their effects on grassland fuels, as well as other outcomes like plant diversity, soil health, etc. This will occur at 8 sites in Southern Boulder County (5 on OSMP properties, 2 on BCPOS, and 1 in Louisville). Project setup is occurring during summer 2024 with first treatments occurring either fall 2024 (burning and mowing) or 2024/2025 (grazing). Implementing these treatments will require coordination and collaboration across organizations. Pre-treatment data will be collected summer 2024 and post-treatment data will be collected in fall 2024, continuing annually thereafter.

Treatment plots are approximately 1 acre each and at each site will involve excluding cattle from ~3 acres using electric fences whenever cattle are present. The prescribed fire plot will likely be ~2 acres and span across the enclosure fence line to have some burn area in a grazed area. Grazing and mowing will be implemented annually while prescribed fire will be implemented in 2024 and likely not again until ~3 years later. In most cases, each experimental site will involve excluding cattle from ~3 acres using electric fencing then implementing the control, mow, and burn treatments within that enclosure.

- Main Lead: Jonathan Henn
 - Main lead is in charge of coordinating treatments with partners and with collecting data on outcomes of the project
- Other contacts:
 - BOSMP: Chris Wanner (general coordination), Paul Dennison (fire and mowing), Ryan Middleton (grazing)
 - BCPOS: Erin Maier (fire, mowing, and grazing)
 - Louisville: Nathaniel Goeckner (fire, mowing, and grazing)
 - Other contacts will be in charge of coordinating and communicating with the project lead about the implementation of treatments on their properties, what they need and what they can do. See below for more detail on each of the types of treatments
- Treatment details:
 - Prescribed fire: We will do our best to implement prescribed fires in fall (Oct-Nov) of 2024 at all plots. This depends on preparing burn plans and determining the appropriate type of burn to get the required permits lined up. Because Boulder County has the greatest capacity for implementing prescribed fire, our ideal situation is to have them implement all fires (regardless of property owner). To start this process, we will mark all plots and create shapefiles of their locations for review by Boulder County fire and other partners.
 - Main lead is in charge of coordinating with partners to make sure prerequisites are met in time to implement the burns in the fall (weather permitting)
 - Partner organization leads: Erin Maier (BCPOS) is the main contact for the details of what is needed to get fire implemented. Paul Dennison (BOSMP) and Nathaniel Goeckner (Louisville) are main contacts to ensure that the needs of their organizations are met in the planning of the prescribed fires
 - Mowing: We will implement mowing treatments annually in the fall (Sept/Oct). This can be done by either using mowers or weed whips, depending on the preferences of each partner organization. The mowed material can be collected as hay if desired, but this is not required. Each partner organization will be in charge of implementing these treatments as resources allow, but the project leads will assist in determining ideal

timing, ensuring that the right plots are mowed and that burn breaks are mowed at the same time.

- Partner Organization leads: Paul Dennison (BOSMP), Erin Maier (BCPOS), and Nathaniel Goeckner (Louisville)
- Grazing: We will primarily leverage the normal grazing plans from each organization and their grazing leasees. The most important part is that each organization will have to notify the project leads on the timing of grazing so that we can put up the electric fencing and determine an appropriate monitoring schedule to ensure that the fence remains intact during the duration of the grazing. Project leads will ensure that we can measure utilization in the areas we monitor as the timing, duration, and number of cattle grazing will vary across experimental sites.
 - A note on grazing. The project leads are very interested in evaluating the effectiveness of using virtual fencing in targeting grazing for fuel treatments at large scales. As such, the project leads would be excited to be involved in conversations and planning around virtual fencing trials implemented by BOSMP and BCPOS.
 - Partner Organization leads: Ryan Middleton (BOSMP), Erin Maier (BCPOS), and Nathaniel Goeckner (Louisville)

Fire behavior modeling: We will employ a range of fire models (empirical fire spread models and physics-based models). We will use and compare two approaches as each have their tradeoffs between realism and scale. The models will be parameterized using data collected in the monitoring and experimental parts of this project and combined with local and landscape-scale characteristics to better understand how grassland fuel structures influence fire behavior at fine scales and across the landscape. We will then implement scenarios of fuel treatments to evaluate the effectiveness of different approaches in reducing fire risk to the built environment.

- Main Lead: Jonathan Henn
 - Main lead is in charge of gathering and managing data important for parameterizing fire models and implementing the modeling experiments
- Other contacts: Paul Dennison (OSMP), Chad Hoffman (Colorado State University)
 - Other contacts are in charge of consulting with main lead to determine the best and most interesting modeling experiments to run and to ensure that the models are run appropriately

Communication: Communication between partners and project leads will primarily occur via email or phone. In the event of any questions regarding the project or its implementation, do not hesitate to contact project leads. We will also plan biannual meetings with partner organizations in March (pre-field season) and November (post-field season) where we will provide project updates and solicit any feedback or thoughts from all the partners.

Funding: This project is primarily funded by a Joint Fire Science Program award to the project leads. This funding covers salaries for the project leads and student assistants and travel to field sites for these personnel. It also covers all necessary research supplies and equipment for making the field and lab measurements. It can also cover expenses related to treatment implementation and project setup, as needed. The fuel monitoring was started a year early thanks to \$10,000 from each of BOSMP, BCPOS, Longmont, and JeffCo in 2023. BOSMP has also agreed to contribute \$15,000 toward setting up and running the experiment.

Reporting: The project leads will provide a short report on project progress annually in September/October, concurrently with required reporting for the grant.

Publication/authorship guidelines: Project support (logistical and financial) will be acknowledged in any publications/outreach materials that emerge from this research. For scientific publications, any individuals who contribute to at least three of the following activities: project design/conceptualization, project supervision, data collection, data analysis, writing, and revising will be invited to be included as an author.

Publicly accessible information: We aim to develop a website (part of the Suding lab website) to provide information on project goals, activities, and outcomes. Material published on the website will be sent for review to all project partners before publication. We will not publish detailed information on project site locations, treatment timelines, etc.

PROPOSAL

Project Timeline: 2024-2026, continuation into 2027 possible but contingent on funding and needs.

2024													
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
Experimental setup													Marking corners, creating shapefiles
Burn planning													
Experiment: pre-treatment data													
Monitoring: peak biomass data													
Implement grazing													Exact timing not important this year
Implement mowing													
Implement prescribed fire													
Experiment: post-treatment data													
Monitoring: post-growing season data													
Data management, analysis, modeling													
Biannual partners project meeting													
Workshop: Virtual fencing for large-scale fuel treatments													An idea, is this of interest?
2025													
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
Experiment: spring data collection													
Monitoring: spring data collection													
Experiment: peak biomass data													
Monitoring: peak biomass data													
Implement grazing													Exact timing TBD
Implement mowing													
Experiment: post-treatment data													
Monitoring: post-growing season data													
Data management, analysis, modeling													
Biannual partners project meeting													
Large scale trial of virtual fencing with fuel treatments in mind													Proposed, details and feasibility could be discussed at workshop in 2024
2026													
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
Experiment: spring data collection													
Monitoring: spring data collection													
Experiment: peak biomass data													
Monitoring: peak biomass data													
Implement grazing													Exact timing TBD
Implement mowing													
Experiment: post-treatment data													
Monitoring: post-growing season data													
Data management, analysis, modeling													
Biannual partners project meeting													
Workshop: Lessons learned and next steps													

Smooth Brome Trial Study (Draft)

Proposed by: Nathaniel Goeckner M.Env, Certified Ecologist, ESA

City of Louisville – Open Space, Natural Resource Supervisor

1.1 Background

The City of Louisville, Colorado, is located at an elevation of 5,338 feet. It is situated at the confluence of two grassland types comprising Eastern Colorado's Front Range prairie: Western Shortgrass Prairie and Piedmont & Foothills Grassland. Colorado's shortgrass prairie contains short-stature grasses with a mix of mid-height, various perennial and annual forbs, and some patches of shrubs. The shortgrass prairie can be found from elevations (3,560 to 6,000ft) and covers much of the eastern part of the state.¹ In areas of higher elevation within its range, shortgrass prairie intermixes and intergrades with foothills and Piedmont grassland. This ecosystem was historically treeless and characterized by short grasses, mixed mid/tall grasses, and warm-season grasses. It is comprised of species of big & little bluestem (*Andropogon gerardi*, *Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), various forbs like dotted blazing star (*Liatis punctata*), white sagebrush (*Artemisia ludoviciana*), soapweed yucca (*Yucca glauca*) and secondary warm season short stoloniferous grasses like buffalograss (*Bouteloua dactyloides*).² With blue grama grass being the most dominant and widespread grass species. Across the short grass prairie, areas with more mesic conditions and areas with sand-supported taller grasses creating a more mixed prairie structure.¹

Grassland plant communities have been heavily influenced by the human introduction of exotic and invasive grass species such as smooth brome (*Bromus inermis*), cheatgrass (*Bromus tectorum*), Japanese Brome (*Bromus japonicus*), and crested wheatgrass (*Agropyron cristatum*). Smooth Brome, a member of the Poaceae family, is one of the most successful and aggressive introduced grasses, spreading across the western great plains and invading both cool and warm-season prairies.³ Smooth Brome was introduced into the United States in the 1880s as a soil stabilizer and forage species. Eventually, escaping cultivation and soil stability treatments to rangeland across the US. Historically, this species was not viewed as an invasive plant. Still, due to the short timeline of its takeover and ability to out-compete and overcrowd native plants, it has been the focus point of control and restoration efforts.

1.2 Smooth Brome

Smooth brome is a perennial grass that is a fast-growing C3 (3-phosphoglycerate) cool-season grass species. Cool-season grasses begin growing in early spring, favoring cooler spring weather, and continue

1 Decker, K., R. Rondeau, J. Lemly, D. Culver, D. Malone, L. Gilligan, S. Marshall. 2020. Guide to the Ecological Systems of Colorado. Colorado Natural Heritage Program, Colorado State University, Fort Collins, Colorado.

2 Natural Resources Conservation Service (NRCS), September 2023. Range Site Description for Cobbly Foothill #213. : USDA, Denver Colorado.

3 Palit, R.; DeKeyser, E.S. Impacts and Drivers of Smooth Brome (*Bromus inermis* Leyss.) Invasion in Native Ecosystems. *Plants* 2022, 11, 1340. <https://doi.org/10.3390/plants11101340>

growing into early summer until the arrival of hot temperatures. They are known to continue growing again in fall with the return of cooler weather. Once hotter weather arrives, these grasses produce seed and go dormant. Smooth brome is a rhizomatous grass species with strong and deep roots, and its prolific root growth increases its invasiveness. Smooth brome can reproduce both via seed and vegetative through rhizomatic growth. Growing in earlier spring gives Smooth Brome an advantage as growth occurs before native C4 warm-season grasses, giving it a competitive edge in gathering nutrients and resources before native grasses, limiting their availability to resources.³ Over time, this grass is able to establish monoculture stands and pushes native species out of habitats. Ungulates will typically prefer native grasses to smooth brome due to the lower palatability of smooth brome, especially after the grass has gone dormant and started to dry, and this, in turn, can increase the abundance of smooth brome grass in rangeland and pastures. Smooth brome thrives in soils with higher amounts of nitrogen and can break down residual leaf matter faster than native plants.^{3 4} This feedback allows smooth brome to feed off vegetative litter and create nitrogen-rich conditions in which the plant can transport these nutrients from older plants to younger progenies.⁵ These physiological traits allow Smooth brome to thrive and become a vehement invader of native prairies. Smooth brome invasion of native grasslands and replacement of native grassland species can eventually transform diverse ecosystems dominated by native plants into a monoculture and novel ecosystem. The impacts of these grass species on native ecosystems now require comprehensive management and restoration efforts.³

1.3 Management

While smooth brome has proven to be a pervasive introduced grass species, several types of treatment and management can be used to lessen grass abundance and stress vegetative growth and reproduction. Treatments like mowing, grazing, herbicide, and burning have been used to control smooth brome. Timing treatments should be emphasized on the early season boot stage of the grass, and cutting/grazing during this time would take advantage of low levels of carbohydrates in the root system, causing damage to smooth brome.⁶ Grazing can be a better control option over herbicides for smooth brome management without harming cool-season native grasses.⁷ Fire has been used as an effective management option to control smooth brome. Early spring and late fall burns over a regular fire return interval have been proven to be an effective management option. Caution should be used to allow the recovery of native plants to avoid damage to those plant communities. When invasive cool-season grasses grow with warm-season native grasses, emphasis on spring control treatments creates a

4 Vinton, M.A., Goergen, E.M. Plant–Soil Feedbacks Contribute to the Persistence of *Bromus inermis* in Tallgrass Prairie. *Ecosystems* 9, 967–976 (2006). <https://doi.org/10.1007/s10021-005-0107-5>

5 Edward S. DeKeyser, Miranda Meehan, Gary Clambey, Kelly Krabbenhoft "Cool Season Invasive Grasses in Northern Great Plains Natural Areas," *Natural Areas Journal*, 33(1), 81-90, (1 January 2013)

6 Knievel, D.P., Jacques, A.V.A. and Smith, D. (1971), Influence of Growth Stage and Stubble Height on Herbage Yields and Persistence of Smooth Bromegrass and Timothy1. *Agron. J.*, 63: 430-434. <https://doi.org/10.2134/agronj1971.00021962006300030025x>

7 Bahm MA, Barnes TG, Jensen KC. Herbicide and Fire Effects on Smooth Brome (*Bromus inermis*) and Kentucky Bluegrass (*Poa pratensis*) in Invaded Prairie Remnants. *Invasive Plant Science and Management*. 2011;4(2):189-197. doi:10.1614/IPSM-D-10-00046.1

competition shift that favors native species and their growth cycles, especially warm-season natives. Chemical herbicides such as imazapyr, imazapic, and sulfometuron have been used to control smooth brome. Studies have reported that these herbicides have caused a 70% decline in smooth brome productivity.³ Research in Nebraska, South Dakota, and Kentucky has shown that imazapyr, imazapic, and sulfosfron applications improved native grass cover.⁸

Mowing Smooth Brome can be an impactful management option and should be targeted when smooth brome is in the early boot stage, followed by two to three subsequent mowings throughout the growing season. The boot stage for smooth brome occurs when flowering heads are still enclosed within the sheath and stem around 18-24 inches in height.⁹ Cutting at the boot stage of the plant just after the apical meristem has begun to elongate within the sheath can take advantage of the lower root carbohydrate levels, stressing the plant.¹⁰ High-intensity grazing in time-controlled rotations during this booting stage is detrimental to smooth brome survival and spread.³ There is no panacea for controlling smooth brome and restoring native prairies. Instead, an adaptive approach utilizing several methods is needed to accomplish restoration and land manager goals in the long term.

1.4 Objective

- The main objective of these study plots is to determine the most efficient and best method(s) for combating smooth brome spread and abundance.
- Best method(s) for encouraging native grass regeneration and restoration into degraded prairie and rangeland systems.
- Comparison of efficacy between treatment options and cost comparisons between treatment methods.
- Best treatment for use at a larger scale, multiple acreages.
- Most ecosystem-comprehensive and low-impact treatment method(s)
- Provide community education and outreach on COL Open Space prairie restoration work
 - Provide lunch and learn to land management partners

1.5 Methodology

There will be 13 plots, including a control plot, that will receive no treatment and will be used to directly compare the various treatment methods utilized in the other plots. Each treatment type will have an unseeded plot as well as a seeded plot. Seeding will be implemented and completed in the Fall of 2024. Grazing and mowing will target the early season growth during the “boot stage” of Smooth Brome or a vegetative growth of 18 inches in height, depending on weather conditions and seasonality.

- There will be a total of 13 plots
 - 1 control plot

8 Matt A. Bahm, Thomas G. Barnes "Native Grass and Forb Response to Pre-Emergent Application of Imazapic and Imazapyr," *Natural Areas Journal*, 31(1), 75-79, (1 January 2011)

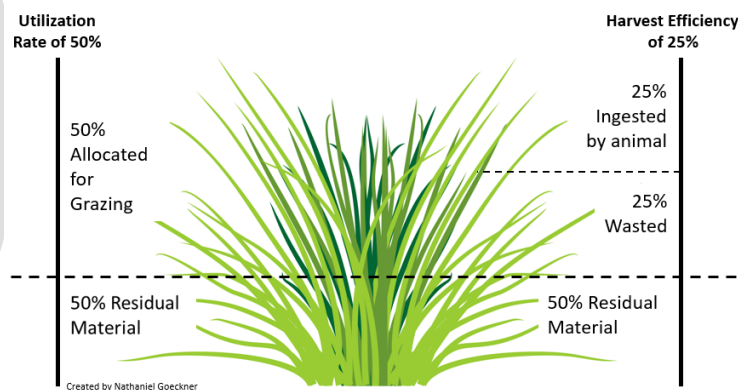
9 Illinois Department of Natural Resources (n.d.-a). Vegetation management guideline - [dnr.illinois.gov. https://dnr.illinois.gov/content/dam/soi/en/web/dnr/inpc/documents/vmg/vmg-29-smooth-brome-revised-2017.pdf](https://dnr.illinois.gov/content/dam/soi/en/web/dnr/inpc/documents/vmg/vmg-29-smooth-brome-revised-2017.pdf)

10 *Bromus inermis* - bugwoodwiki. (n.d.-a). https://wiki.bugwood.org/Bromus_inermis

- 12 various treatment type plots (Seeded and unseeded)
- Plot size
 - 75ft x 75ft , 5,625 ft² or 0.13 acres
- Soil Testing
 - Nitrogen levels
 - Soil pH testing
 - Soil microbial (diversity, abundance, etc)
- Herbicide treatments will be administered in the fall of 2024
 - Application in Fall 2024

Grazing

- There are four treatment allotments
- Two different grazing rates will be used across all four plots
- Two plots will be seeded, and two will be left unseeded
- Grazing rates will be measured at 70% and 100% utilization (see Figure below)



Soil Type

- Study plot soil type
 - All plots are located in the soil type **Ascalon Sandy Loam**

Mowing

- Treatment types will be implemented in early spring when smooth brome has hit a target height of 18 inches.
- Two treatment plots with two rounds of mowing at each interval of grass height of 18 inches

1.6 Vegetation Measurements (Pre-treatment and Post-treatment)

- Quantifying Vegetation and ground cover
 - Point Intercept Transects
- Photo Points
- Grass heights measured at the time of first treatment

- Measurements taken at Pre-treatment (Spring 24) and Post Treatment (Fall 24)

1.7 Ascalon Sandy Loam Properties and Taxonomy (USGS Web Soil Survey)

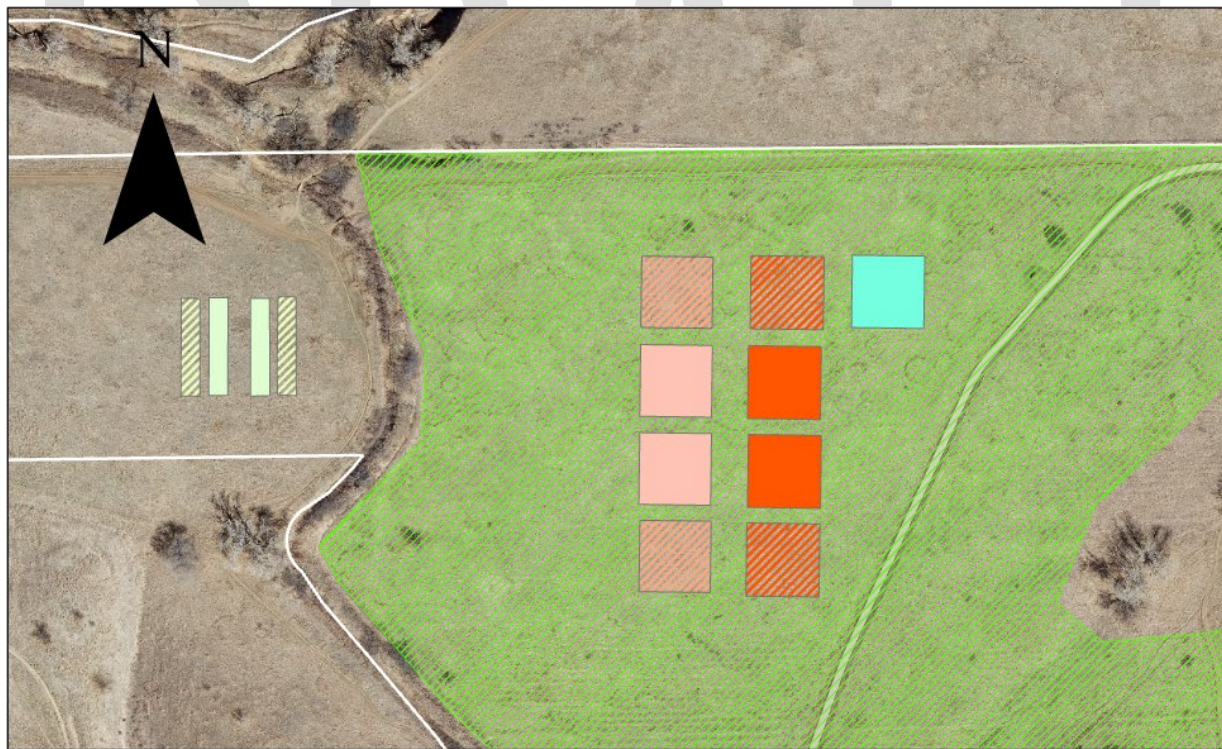
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors		
										Kw	Kf	T
	<i>In</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>	<i>g/cc</i>	<i>micro m/sec</i>	<i>In/In</i>	<i>Pct</i>	<i>Pct</i>			
AcA—Ascalon sandy loam, 0 to 3 percent slopes												
Ascalon	0-6	53-67- 67	19-19- 33	8-14- 16	1.48-1.52-1.56	14.11-28.23-42.34	0.09-0.11-0.12	0.7- 1.3- 1.6	1.0- 1.0- 2.0	.17	.17	5
	6-12	52-57- 63	12-18- 23	18-25- 27	1.41-1.51-1.61	4.23-9.00-28.23	0.10-0.13-0.18	1.8- 3.1- 3.5	0.5- 0.6- 1.0	.20	.20	
	12-19	52-57- 63	12-18- 23	18-25- 27	1.41-1.51-1.61	4.23-9.00-28.23	0.10-0.14-0.18	1.6- 3.1- 3.3	0.4- 0.5- 0.8	.20	.20	
	19-35	56-62- 68	4-15- 29	15-23- 28	1.37-1.48-1.60	4.23-9.00-14.11	0.14-0.16-0.18	1.1- 1.6- 2.5	0.2- 0.2- 0.5	.20	.20	
	35-80	66-75- 81	3-11- 25	9-14- 16	1.51-1.62-1.73	14.11-28.00-42.33	0.08-0.11-0.13	0.0- 0.5- 0.8	0.1- 0.1- 0.2	.15	.15	

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	<i>In</i>	<i>meq/100g</i>	<i>meq/100g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
AcA—Ascalon sandy loam, 0 to 3 percent slopes								
Ascalon	0-6	6.6-14	—	6.6-7.6	1	0	0.1-2.0	0
	6-12	14-22	—	6.6-7.6	1	0	0.1-2.0	0
	12-19	14-20	—	6.6-7.6	1-3	0	0.1-2.0	0
	19-35	13-15	—	7.9-9.0	5-10	0	0.1-2.0	0-1
	35-80	3.8-5.6	—	7.9-9.0	5-10	0	0.1-2.0	0-1
AcC—Ascalon sandy loam, 3 to 5 percent slopes								
Ascalon	0-6	6.4-13	—	6.6-7.6	1	0	0.1-1.9	0
	6-12	14-21	—	6.6-7.6	1	0	0.1-1.9	0
	12-19	14-19	—	6.6-7.6	1-3	0	0.1-1.9	0
	19-35	6.1-15	—	7.9-9.0	5-10	0	0.1-1.9	0-1
	35-80	3.6-5.2	—	7.9-9.0	5-10	0	0.1-1.9	0-1
AcD—Ascalon sandy loam, 5 to 9 percent slopes								
Ascalon	0-5	4.0-15	—	6.6-7.8	0	0	0	0
	5-16	5.0-25	—	6.6-7.8	0-5	0	0	0
	16-60	5.0-20	—	7.9-9.0	0-10	0	0.0-2.0	0
AoE—Ascalon-Otero complex, 9 to 20 percent slopes								
Ascalon	0-6	7.3-14	—	6.6-7.6	1	0	0.1-2.0	0
	6-12	15-22	—	6.6-7.6	1	0	0.1-2.0	0
	12-19	15-21	—	6.6-7.6	1-3	0	0.1-2.0	0
	19-26	7.4-12	—	7.9-8.4	1-3	0	0.1-2.0	0
	26-80	7.4-12	—	7.9-8.4	5-10	0	0.1-2.0	0-1

Soil name	Family or higher taxonomic classification
Ascalon	Fine-loamy, mixed, mesic Aridic Argiustolls
Ascalon	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Otero*	Coarse-loamy, mixed, superactive, mesic Aridic Haplustepts
Valmont	Clayey over loamy-skeletal, montmorillonitic, mesic Aridic Argiustolls
Water	

1.8 Treatment Types

	Mowing	Mowing	Haying	Grazing	Grazing	Herbicide	Control
Seeded w/ Native Mix	Mowing 1 One spring mowing at 18in grass height	Mowing 3 Two mows at 18in grass height	Haying 1	Grazing 1 (Utilization 70%)	Grazing 3 (Utilization 100%)	Herbicide 1	Control 1
Unseeded	Mowing 2 One spring mowing at 18in grass height	Mowing 4 Two mows at 18in grass height	Haying 2	Grazing 2 (70%)	Grazing 4 (100%)	Herbicide 2	



Legend

S.Brome_Study_Plo... Treatment_Type

Control	Grazing	Mowing Seeded
Solarizing/Shading Seeded	Grazing Seeded	Solarizing/Shading
Herbicide Seeded	Herbicide	<all other values>
Herbicide Seeded	Mowing	

1.9 References

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