



Parks & Open Space

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PARKS & OPEN SPACE ADVISORY COMMITTEE MEETING

Time/Date of Meeting: 6:30 p.m., Thursday, Sept. 28, 2023

Location: Boulder County Courthouse
1325 Pearl Street, Third Floor, Boulder

TO:	Parks & Open Space Advisory Committee
FROM/PRESENTER:	Joe Swanson, Weed Management Group, and Tina Nielsen, Special Projects Coordinator
AGENDA ITEM:	Integrated Weed Management Plan Updates
ACTION REQUESTED:	Information Only

Introduction

The purpose of this presentation is to provide POSAC with an update on the Integrated Weed Management Plan update process. This memo and the presentation summarize what staff has heard to date, how staff is responding, and next steps in the process.

The Integrated Weed Management Plan public process kicked off in June with POSAC presentations and public field trips:

1. POSAC Presentations
 - June: Behavior of Cheatgrass, Scott Nissen, CSU Emeritus, CSU Weed Sciences
 - July: POSAC Weed Tour, Rabbit Mountain
 - August: Herbicide Labeling, Safety, and Approval Process, Lisa Blecker, CSU
 - Sept: IWMP update, Staff
2. Weed Tours (See Appendices for detailed field trip reports and staff responses to questions)
 - 6/29 Weed Tour: Colorado Native Plant Society, Rabbit Mountain
 - 7/25 Public Weed Tour: Pierce and Monarch (facilitated)
 - 7/27 POSAC Weed Tour: Rabbit Mountain
 - 8/22: Public Weed Tour: Rabbit Mountain and Dowe Flats (facilitated)
 - 10/13: BOCC Weed Tour

Next steps:

3. Review and public input of the DRAFT Integrated Weed Management Plan
 - 9/29: Draft plan, story map, and online survey to be posted on the [webpage](#)
 - 10/11: Open House (facilitated)
 - 10/18: online survey closes
4. Public Hearings and adoption (Dates subject to change)
 - 12/7: POSAC public hearing and recommendation (special meeting)
 - 1/23/24: BOCC Hearing #1, public comment
 - 2/15/24: BOCC Hearing #2: Deliberation and Decision (no additional public comment)

What staff has heard so far (see Appendices for detailed reports from the three weed field trips conducted to date):

- Breakdown of integrated weed management tools used by Boulder County (see response below)
- Questions about other agencies and how Boulder County's weed treatment practices compare to other agencies (see response below)
- Concern about use of pesticides, concerns for human and ecological health, desire to minimize pesticide use
- Desire to understand decision process for which infestations to control, which tools to use, and how these decisions and practices are evolving based on monitoring and research
- Questions about effectiveness of different tools, especially non-chemical treatments, also tradeoffs and cost effectiveness
- Questions about cheatgrass, connection to fire danger, utility as forage
- Appreciation of complexity of balancing multiple (sometimes competing) values, as referenced in the wicked problem framework
- Desire for information and tools to address weed problems on private property

How staff is responding to public input:

- New IWMP Objective and Strategies, incorporating strategies for management (including minimizing herbicide use), collaboration, communication, and health and safety

Integrated Weed Management Objective

Boulder County restores, improves, and maintains healthy, functioning ecosystems and economically viable agricultural lands through responsible, proactive, and adaptive management of noxious weeds in accordance with State law.

Strategies

1. ***Manage:*** Use IWM tools and best practices to improve and maintain ecosystem diversity and health by preventing the introduction of new noxious weed species, eradicating isolated or limited populations, containing and suppressing noxious weed species within the county, while decreasing the use of herbicides over time.
2. ***Collaborate:*** Collaborate and cooperate with staff, partners, peer agencies, private property owners, and the public to improve noxious weed management throughout the county and region.
3. ***Communicate:*** Provide timely and transparent public notice about use of herbicides.
4. ***Health and Safety:*** Follow application labels and best practices to protect the health and safety of staff, the public, and ecological values.

- New IWMP section on implementation, includes information on decision process and explanation for why/how/when different tools come into play
- Proposed new aerial spray policy and buffers; also proposed use of drones for aerial application
- IWMP includes detailed information on pesticide products and toxicity
- Story map to be included on webpage will be a companion to IWMP. It will bring the IWMP to life by illustrating the scope of the weed problem and examples of how decision process plays out in different circumstances with different tools and outcomes
- Open house includes a deliberate facilitated discussion to help get at the tradeoffs between the different tools and methods of weed control.

Breakdown of Boulder County's Integrated Weed Management Tools

County weed staff collects detailed data on staff time devoted to weed management and treatment areas and methods. From year to year, treatment area size and tools used can vary widely depending on a number of factors including weather, staffing, equipment breakdowns, new properties acquired, new weed populations discovered, new disturbances (including new trail construction and natural disasters), etc. To date this year (through Sept. 14), staff has treated 8,834 acres of our 49,000 acres (42,000 acres natural lands plus 7,000 acres rangeland). The breakdown is as follows:

- two-thirds (36%) of treatments have been manual (hand pulling, digging, deadheading).
- Herbicide applications account for 18% of treated acres or half of manual treatments this year so far.
- Scouting for new weed infestations (preventative/cultural tool) accounts for 18% of acreage.
- Mowing accounts for 14% of acres (not including roadsides), partially as a result of the mower being out of commission for approximately 6 weeks so far this season.
- There have been six biological control releases for Dalmation Toadflax and Yellow Toadflax on six properties, targeting 2,500 acres.
- The data for time spent has a similar distribution. However, we note that this year is not necessarily representative given the ban on aerial spraying.

Peer Agency Comparison: The following chart is a comparison of peer agencies within the state of Colorado and we've also included Midpeninsula Open Space District (California), due to its similar size and scope.

Agency	Land Mgmt Acres	Local Advisory Board	Approved List of Herbicides*	Cheatgrass Mgmt?	Conduct Aerial Spraying; Spray Policy	Buffers	Public Notification for herbicide application on trails
Boulder County	120k	BOCC	Yes	Yes	Yes; No	Yes	Post treatment schedule webpage one week in advance for all herbicides and target species on Friday for upcoming
Larimer County	30k	BOCC	Yes	Yes	Yes; No	Yes	Post on day of treatment
Jefferson County	47k	BOCC	Yes	Yes	Yes; No	Yes	Post treatment schedule one week in advance, signage 1 day in advance
City of Boulder	45k	Staff	Yes	Yes	No	NA	Close trails on day of application
Longmont	2,485	Staff	Yes	Yes	No; No, but under consideration	No	use of city website, 48 hours in advance, posting of 11x17 inch signs on site 48 hours prior to treatment
USFS	~330k	NA	Yes	Yes	Yes; Yes	Yes	Will post to Treatment call in line one week in advance of following weeks expected application with notice of application schedule subject to change due to weather or unforeseen problems. Notification on site.
RMNP	266k	NA	Yes	Limited	No; No	NA	Do a blanket posting of sites with intended dates of treatment, no entry for 24 to 48 hours after treatment
Mid-peninsula	65K	NA	Yes	Invasive Grass	No; No	NA	Post 24 hours prior to treatment; signs remain for 72 hours after end of treatment
Colorado Parks and Wildlife	3mil.	NA	Yes	Yes	Yes; No	Yes	Post in advance of treatment

*RMNP, City of Boulder, USFS, Midpeninsula may deviate from approved prescribed lists only through formal approval process.

As the largest open space program in the state both in terms of acres managed and staff, Boulder County is considered a leader in many areas of land management. Boulder County collaborates and consults with all the agencies listed in the table above and others through involvement with professional associations such as Western Society of Weed Science, Society for Range Management, Colorado Weed Management Association, Great Plains Grassland Conference, Society of Ecological Restoration, and High Altitude Revegetation Workshops. All of our peers use the full spectrum of integrated weed management tools and methods customized to their unique conditions and circumstances. Some agencies are experimenting with the use of novel tools, such as Nutrafix, and Boulder County is eager to learn about those experiences.

Links to peer agency weed management plans:

- Jefferson County: <https://www.jeffco.us/3721/Noxious-Weed-Management>
- Larimer County: <https://www.larimer.gov/naturalresources/weeds>
- City of Boulder: not available on webpage at this time
- City of Longmont <https://www.longmontcolorado.gov/departments/departments-n-z/parks-open-space-trails/park-maintenance/weed-and-pest-management#:~:text=Weed%20Control%20on%20City%20Property,right%20of%20ways%20for%20weeds.>
- Midpeninsula Open Space District: <https://www.openspace.org/what-we-do/projects/integrated-pest-management>
- USFS <https://www.fs.usda.gov/detail/arp/?cid=STELPRDB5158721>
- BLM <https://www.blm.gov/programs/weeds-and-invasives/BLM-control-strategies/colorado>
- RMNP https://www.cal-ipc.org/nps_2003_rockymtn_invasiveexoticplantmanagementplan/

APPENDICES

- July 25, 2023, Field Trip Report Submitted by Carrie Bennett, Facilitator
- August 22, 2023, Field Trip Report Submitted by Carrie Bennett, Facilitator
- Staff Responses to comment card questions from field trips on July 25, July 27, and Aug. 22

Boulder County Parks & Open Space IWMP
Weed Tour Summary
July 25, 2023

Prepared by Carrie W Bennett



Having concluded the public weed tour with Boulder County community members and Parks & Open Space staff on July 25, I respectfully submit the following report to Boulder County leadership and residents. The information that follows is intended to document the process and basic outcomes. Nothing in this report is intended as an endorsement nor condemnation of any position or priority.

Contents of this report are as follows:

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Basic Information

- The weed tour began at the Parks and Open Space office at 5201 St. Vrain Road in Longmont.
- Approximately 40 people attended this event including community members and county staff.
- The meeting included two main parts: a welcome and grounding (participant introductions, a brief explanation of wicked problems, and event logistics) and two site visits and to explore on-the-ground impacts of different weed management tools.
- At each site, participants were invited to share their own observations before hearing additional information from County Staff. In addition, county staff distributed site-specific information packets. Carrie Bennett, facilitator, posed questions submitted from the group via index cards and helped moderate the discussion.
- At the conclusion of the event, participants were asked to complete a brief observation and feedback form. In all, 22 forms were completed and returned. The data that follows here reflect the results of the participants closing thoughts.
- Unless otherwise indicated with quotation marks, participant comments have been streamlined.

Pierce Property, Stop #1

The Pierce property is located on Hwy 36 south of St. Vrain Road. This site is not open to the public. In 2019, this site was treated with the Rejuvra (indaziflam) herbicide applied with tractor pulled sprayers to control for cheat grass. The following year 2020, the site burned during the Cal-Wood fire. In addition to the 2019 Rejuvra application, the herbicide Quinstar 4L was applied to this site in June of 2019 to control bind weed. The only other tools that have been used on this site since Boulder County acquired this property, is hand pulling or digging of Mediterranean Sage. Participant observations and insights from this location are listed below. NOTE- if multiple participants listed a similar observation, the numbers repeating this idea are indicated in parenthesis.

Observations on the Landscape

- Effectiveness of County management: native plants thriving, outnumbering cheat grass and other weeds (7)
- Beautiful natural meadow/prairie ecosystem, diverse native species (5)
- Bare ground, hard, cracked soil (3)
- Curly dock (weed with tall brown stocks) (2)
- Few insects (2)
- Lots of grass
- Burned fields
- Wolly mullein
- No public use
- Bindweed? Succession of weeds?
- Interested to follow changes in the coming years

New Learning

- The process and methods about weed management (3)
- Good to understand how the County approaches the challenge (3)
- Impact and history of cheat grass on the landscape: crowding out native plants and taking over. (2)
- Change is possible, cheat grass eradication worked (2)
- Different weed classes, A, B, C, + Watch List and how the County has to/chooses to manage these listed weeds
- Explanation for bare ground
- Hard to tease apart of the impact of fire vs. herbicide application
- Rejuvra is used a lot to manage weeds
- Curly dock seeds don't remain viable for long in the soil
- Native seeds are deeper in the soil and the Rejuvra stays higher (top layer). Allows for effective treatment of cheat grass while supporting regrowth of native plants.
- There's good (native) thistle
- Purple threeawn (native grass)

Priorities

- Concern about the spread of curly dock
- Figuring out how to treat hard to reach areas (arial application with planes, drones, helicopters on steep hillsides) without public alarm
- Concern about toxicity of Rejuvra to mammals and impact on perennial grasses

Monarch Park, Stop #2

Monarch Park is in Niwot. The group parked at the Niwot Trailhead before crossing N 79th St. and following the path about 100 yards to the west. This site was previously used for agriculture (livestock and grazing). After the County purchased the land, it was home to a large prairie dog colony that had eaten the vegetation down to bare soil. In the fall of 2021 and spring of 2022, this site was rehabilitated. A mix of seeds (grasses and flowering plants) were planted. Since then, weed management efforts in the 22-acre restoration zone have been mostly mowing and hand pulling with some spot application of herbicide. Participant observations and insights from this location are listed below. *NOTE- if multiple participants listed a similar observation, the numbers repeating this idea are indicated in parenthesis.*

Observations on the Landscape

- Effective rehabilitation of vegetation, recovery after over grazing (4)
- Lush/dense vegetation with a lot of grasses and flowers (4)
- No prairie dogs
- Lots of public use and enjoyment
- Hard soil, no organic matter/fertility (2)
- More vegetation
- Still being sprayed (??)
- Establishment period
- No sign of curly dock or mulleins
- Interesting to see a complete re-do of an area vs. the restoration that happened at Pierce.
- Prairie dogs

New Learning

- Rehabilitation takes a while. Things can go badly
- Different processes and methods for restoration (2)
- It may take years to rebuild the soil
- It's possible to restore barren ground with intense revegetation (2)
- Herbicides used don't directly affect insects
- Impact on natural cycle
- The number of species seeded vs. what is seen
- There is hope

Priorities

- Interested in planting to coexist with prairie dogs
- Concern when treatment is pursued without long-range plans
- Concern about disruption to prairie dog's social systems, being separated in traps

Overall Observations about and Feedback on Weed Management Tools

Herbicides

- Concerned about the environmental impact, health and safety, toxicity (12)
- Are very effective at killing the targeted plants (7) convenient
- Seem like these are preferred over other methods, used frequently (7)
- Good that Rejuvra is so effective with just one application (3)
- Impressive how it killed cheatgrass and allowed other natural plants to recover (3)
- Glyphosate is still in use (2)
- Staff seems more supportive of herbicide use than the public is
- Used too frequently
- Are there other options?
- Used close to human populations and waterways
- Not enough oversight for herbicide use
- Costly to purchase and apply
- Cheatgrass eradication mitigates fire risk
- Concerned about staff exposure (long term) to the herbicides
- Prefer to avoid non-selective herbicides
- Takes a lot of work to educate the public about the safety of herbicides
- Concern about longevity in soil, run-off, and accumulation of herbicides over time

Other tools (mechanical, biological, cultural, controls)

- Grazing seems like a rarely used tool/low priority. Should be used more, more investment of time and money to use it (3)
- Keeping many species of weed from going to seed is effective.
- Reseeding with high diversity led to lush growth at Monarch.
- Mowing/mechanical tools seem promising.
- Open Space hasn't hired a contract grazer or landscaping crew to mow.
- No long-term plans for grazing
- Lyons weed posse tries to do all weed management without herbicides but "we can't do it all!"

Suggestions

- Do more testing (herbicide safety) (3)
- Timing is everything (2)
- More education (2)
- More efforts to engage volunteers with weed management (2)
- Use grazing more frequently to decrease the need for chemicals (2).
- Figure out how to solve the problem without chemicals (2)
- Use the least toxic treatment first if practical (2)
- Work with farmers/land stewards who care about long term health of the land/ecosystem and will use integrative methods (2)
- Want more plantings/sites to coexist with prairie dogs.
- "Work with nature, not against it. Where is the balance in spraying chemicals?"
- Do a better job of educating the public about the other management tools.
- Do field trips in late spring with a focus on weed identification.

- “The point of integrated weed management is to be able to reduce the use of herbicides over time by using the full range of tools.”
- “Please care about our planet.”
- “People should trust the science.”

Remaining Questions

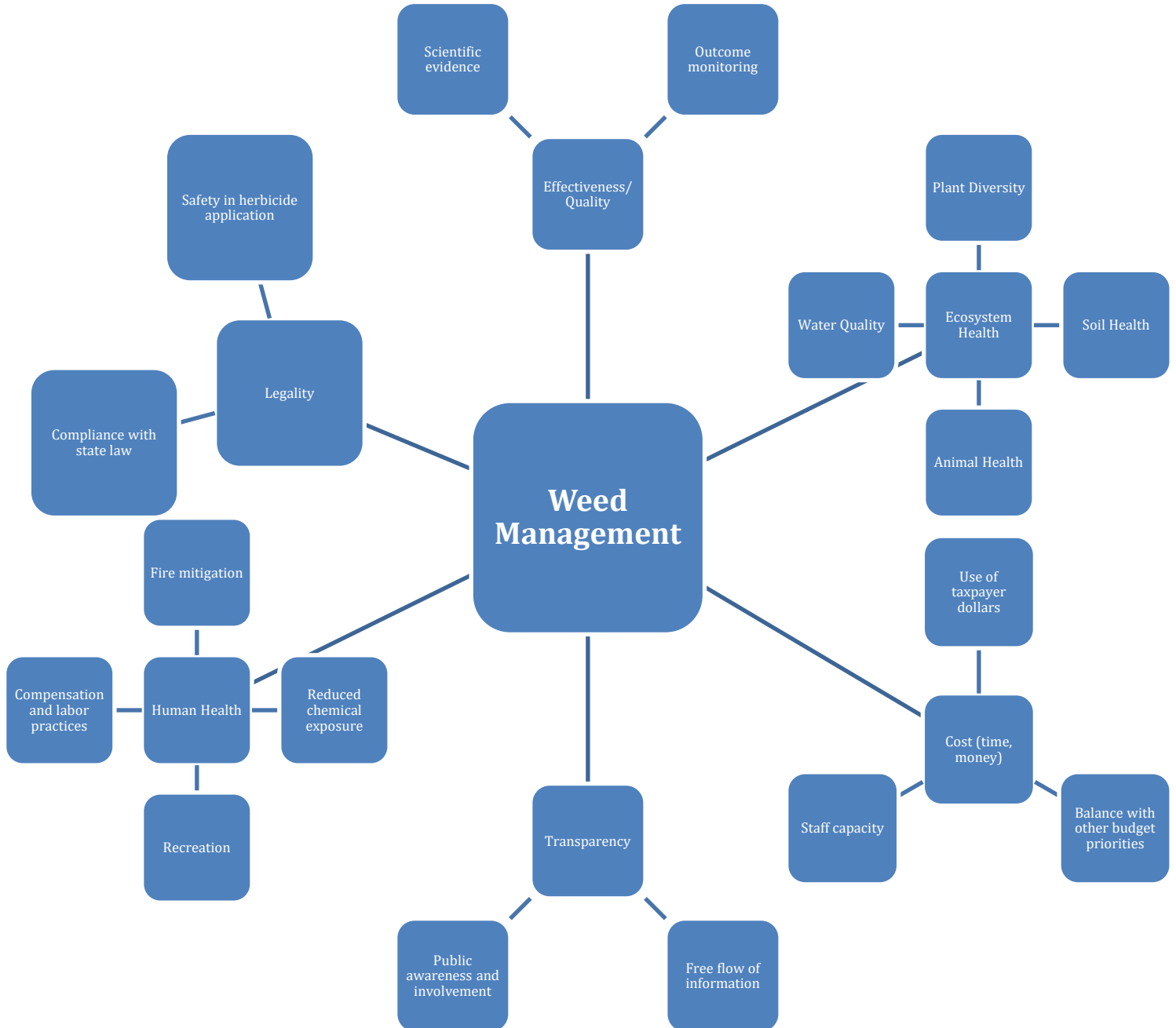
1. How much research is put into using the herbicides?
2. Concern for the bare ground at Pierce. More to the story than just native bee habitat.
3. Would like to learn more about native seeding.
4. How could we boost volunteer engagement for weed management?
5. Want more information about the relative safety of herbicides.
6. How is water quality impacted by herbicides? (2) Want more local testing.
7. How do herbicides move in the soil?
8. “How much money has been spent on herbicides treating class C weeds (including staff time)?”
9. “How much money has been spent on grazing or mowing efforts?”
10. “Is it even worthwhile to participate in this weed management conversation? Open space seems convinced in their tools and are not interested in changing.”
11. “How effective are biological controls?”
12. “How are budget priorities set between weed control on non-public use sites (like Pierce) vs. assisting agricultural leases (tenants) with weed control on agricultural properties?”
13. “What’s the decision process for expensive aerial spray vs. helping tenants with control?”
14. “How does the county decide how to manage weeds at a particular property? Is there a decision tree of some other standardized protocol?”
15. “What’s the long-term plan for restoring the land AND the soil?”
16. Want more information about the treatments (like Rejuvra) and their health pros/cons.
17. “Is it possible to do more grazing for weed control?”
18. “Does restoration sometimes take second place to fire mitigation?”
19. “Are there any changes in strategy for weed control in light of climate change? Other than adding more forbs to seed mixes, are there other new methods that can be adopted to prepare for more rain, fires, floods, etc.?”

Other Comments

- “Thank you for making this available to the public!”
- “Thank you for providing the info shared here today”
- Facilitator interrupted unnecessarily. Joe can hold his own.

Weed Management as an (emerging) Wicked Problem

In exploring complex issues like these, it can be helpful to use a Wicked Problem Mindset (see Appendix A for an explanation of this concept). Through this mindset, the following values are beginning to emerge. Consider which values you prioritize over others and which other values may be in tension with your priorities.



Next Steps

The following dates/events are planned to further this discussion:

- July 27: The Parks & Open Space Advisory Committee (POSAC) tour a site at Rabbit Mountain
- August 22: Second public field trip
- October 11: Open House to continue to learn more about these issues and explore possibilities.
- October: Public comments will be collected online
- Dec. 21: Parks & Open Space Advisory Committee Public Hearing.
- Jan. 23: Board of County Commissioners Public Hearing

Information will continue to be shared through the County's website. County staff are working to collect additional information and will try to answer as many of the participant questions as possible in the coming weeks and months.

It was my pleasure serving you in this capacity. I sincerely appreciate the thoughtful, civil engagement of Boulder County residents on this topic. I look forward to hearing more about your outcomes and would look forward to supporting your needs and your community in the future.

Carrie W. Bennett

Facilitator

[Learning Through Difference, LLC](#)

Appendix A: Field Trip Agenda, Ground Rules, and Wicked Problem Overview



Boulder County Integrated Weed Management Plan Field Trip #1: Pierce and Monarch Park July 25, 5-8 p.m.

Meet at: Boulder County Parks & Open Space Office, 5201 St Vrain Rd, Longmont, 80503

Purpose:

1. Identify and deepen our collective understanding of the benefits and drawbacks of available weed management tools.
2. Explore the County's past practices (past use of diverse tools) and outcomes to date.
3. Collect local ideas (questions, concerns, and priorities) regarding weed management.
4. Develop or strengthen positive working relationships within Boulder County.

Agenda:

- Welcome and Grounding —Carrie & Staff
- Wicked Problem Mindset (basic introduction)—Carrie
- Preliminary Question Identification—Carrie
- Load Vans- Travel to Site #1
- Pierce Property Site Visit**
 - Preliminary observations
 - Additional observations
 - Weed management history (from County Staff)
 - Outcomes/monitoring data (from County Staff)
 - Questions from the initial-round
 - Additional Q&A (if time allows)
- Monarch Park Property Site Visit**
 - Preliminary observations
 - Additional observations
 - Weed management history (from County Staff)
 - Outcomes/monitoring data (from County Staff)
 - Questions from the initial-round
 - Additional Q&A (if time allows)
- Load Vans- Travel to Site #2 (6:45)
- Closing and Evaluation (post-field trip survey completed on ride back)
- Load Vans- Return to Parks and Open Space Offices (7:45-8:00)

Norms/Ground Rules for Successful Engagement

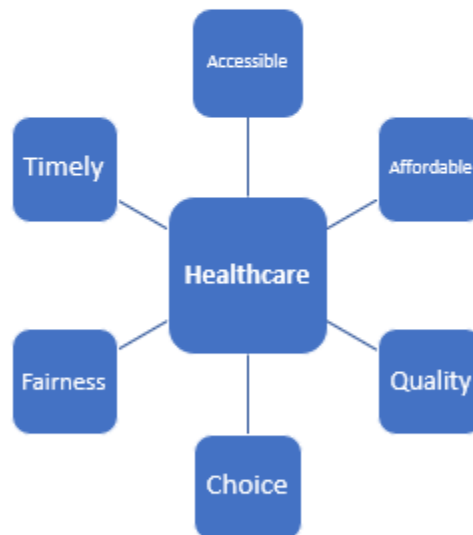
1. Listen to learn- the better we understand things, the stronger our solutions can be.
2. Balance participation- everyone has something to offer, create space for lots of voices.
3. Use a helicopter view- balance a focus on one priority with a landscape perspective.
4. Assume positive intent- we have shared hopes, use curiosity to better understand.
5. Take care of yourself- drink water, eat a snack, watch your step, ask for help...

Wicked Problem Mindset

Martin Carcasson, Colorado State University

“Wicked problems inherently involve competing underlying values, paradoxes, and tradeoffs that cannot be resolved by science.” Competing priorities exist in tension with one another in ways that are difficult/impossible to reconcile. Put simply, with wicked problems, “we can’t have it all.”

Health Care Example:



Our brains hate these paradoxes, we love a good story of good vs. evil. We crave certainty. We prefer simplicity and clarity to ambiguity.

Wicked problems are best understood by identifying and clarifying the priorities in tension AND recognizing the different ways that different people may prioritize or balance those values.

People who prioritize values aren't wicked, the problems themselves are. **Be hard on the problems and easy on the people.**

Appendix B: Preliminary Questions

Before boarding the vans and visiting the identified sites, participants submitted questions (on index cards) which they hoped to have addressed through this process. All questions submitted have been listed here. In this section, questions are taken directly from the index cards with only minor edits for clarity. There was not adequate time or opportunity to answer all of the questions during the field trip; staff responses are provided in a separate document.

1. Do we have capacity to push for more B list enforcement?
2. What are the underlying root causes of weed problems? What is the County doing to address the root causes?
3. Can we get pictures of wicked weeds to identify them at various growth stages and how to kills them?
4. Do wicked weeds have a place in our ecosystem? Is it appropriate for a new wicked weed to replace in indigenous one?
5. Is it possible to have a successful weed management plan without using pesticides or chemicals?
6. What resources are available to help a private landowner come up with a successful weed management plan?
7. How many years does it take for a weed management plan to start showing success? Is it less work over time?
8. Why is the field trip held now rather than when the weeds are in bloom and the grass shorter?
9. What invasive/non-native and listed weeds are managed and which are not managed?
10. How and when did the weed infestation arrive at the two sites we're visiting?
11. What is the County doing to control all the Curly Dock that's taking over?
12. Are landowners who have an outbreak notified by the county?
13. Who is in charge of roadside invasions?
14. What works in controlling/managing invasive plants? Especially teasel, Canadian thistle, and creeping thistle? Are there multiple approaches?
15. How can you eradicate curly dock?
16. Are curly dock and woolly mullein lost causes?
17. How does the County use volunteers in weed management (2)? Do you encourage community groups to work independently after training?
18. What is the cost/benefit analysis done prior to implementing management (especially before applying herbicides)?
19. What steps are taken to ensure ecological safety of pesticides or herbicides?
20. Is the County doing their own testing (monitoring)?
21. Is Boulder County Health involved with runoff concern as they are with compost production?
22. How can a person learn more about the County's weed management practices?
23. Is the County hiring local farmers to graze as a tool to control weeds? What does that look like?
24. What does the public want done in weed management? What are the public values around weed management?
25. When are chemicals (herbicides) used as a part of weed management?
26. How can you control weeds (bin weeds) in a garden spot? Pulling forces the roots to go deeper. Weeds can over take over plantings.

Boulder County Parks & Open Space IWMP
Weed Tour Summary
August 22, 2023

Prepared by Carrie W Bennett



Boulder County Parks & Open Space IWMP Update

Event Summary: Weed Tour August 22, 2023

Having concluded the public weed tour with Boulder County community members and Parks & Open Space staff on August 22, I respectfully submit the following report to Boulder County leadership and residents. The information that follows is intended to document the process and basic outcomes. Nothing in this report is intended as an endorsement or condemnation of any position or priority.

Contents of this report are as follows:

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Basic Information

- The weed tour began at the Trailhead Shelter at the Ron Stewart Preserve at Rabbit Mountain.
- Approximately 40 people attended this event including community members and county staff.
- The meeting included two main parts: a welcome and grounding (participant introductions, a brief explanation of wicked problems, and event logistics) and visits to two site visits to explore on-the-ground impacts of different weed management tools.
- At each site, participants were invited to share their own observations before hearing additional information from County Staff. In addition, county staff distributed site-specific information packets. Carrie Bennett, facilitator, posed questions submitted from the group via index cards and helped moderate the discussion.
- At the conclusion of the event, participants were asked to complete a brief observation and feedback form. In all, 16 forms were completed and returned. The data that follows here reflect the results of the participants' closing thoughts.
- Unless otherwise indicated with quotation marks, participant comments have been streamlined.

Rabbit Mountain Stop #1

Stop #1 on this weed tour was high on the mountain, accessed via 4WD road. This site demonstrates the use of Rejuvra (indaziflam) herbicide, which was applied with tractor-pulled sprayers in 2021 to control for cheat grass. Multiple constraints meant that only a portion of this site was treated. With this, there was a clear dividing line where the cheatgrass had/hadn't been treated. No other tools or treatments have been used on this site since 2021. Participant observations and insights from this location are listed below. NOTE- if multiple participants listed a similar observation, the numbers repeating this idea are indicated in parenthesis.

Observations on the Landscape

- Good to see treated next to untreated areas, could see impact of Rejuvra (3) Loved seeing how well it works!
- Cheatgrass (2)
- Saw multiple cool (painted) grasshoppers (2)
- More diversity of plant species on treated side.
- Mahogany bushes were kind of nice.
- Looks nice! Management was great.
- I've never been here! Thank you for the opportunity.
- No wildflowers
- No bees

New Learning

- Effectiveness for cheatgrass control and how quickly the native plants rebound. (4)
- Learned some plant identification + how to identify cheatgrass and some native grasses (2).
- Learned about cheatgrass.
- Rejuvra is the main method of control here.
- Decision making process for deciding on which treatments to use.
- St. John's Wort is bad, ragweed is good.
- The area is abundantly diverse.
- Rejuvra is a touchy subject. It can be applied by helicopter.
- Cheatgrass is a pain and it blocks out native plants/biodiversity.
- Didn't know about the elk hunt.
- Not enough people listen to the science

Priorities

- Listening to community input

Dowe Flats

Dowe Flats is a property on the southwest side of Rabbit Mountain. It was formerly an intensively-grazed agricultural property. The main weed management tool used in this area has been mowing. Participant observations and insights from this location are listed below. *NOTE- if multiple participants listed a similar observation, the numbers repeating this idea are indicated in parenthesis.*

Observations on the Landscape

- Elk!
- Thistle
- Chamomile
- Bindweed
- It's flat, small plants (2)
- It's green (2) Green is better than dustbowl conditions.
- Evidence of mowing (2)
- Sad state of former ag lands.
- Disappointing how hard it is to improve this site.
- Evidence of prairie dogs.

New Learning

- The elk like it here (2).
- Mowing is the best plan for here, can be effective (3)
- Much more disturbed site, looks like ag production has selected for a narrow range of species.
- Use non-herbicide methods here (mechanical with mowing).
- Learned about cultural methods (grazing)
- Decision process for deciding which treatments to use
- Great to compare the two areas
- The nice seed herbicide
- It would be challenge to restore this
- You can mow thistles

Priorities

- Listening to community input
- Take precautions when using herbicides near prairie dog holes.

Overall Observations about and Feedback on Weed Management Tools

Herbicides

- Don't use artificial pesticides
- Lots of chemical control of cheatgrass, even though it's not an A or B list species.
- Appreciate spot treatment and understand how time consuming it can be.
- "Heavy handed. Stop. Follow your own mission and eliminate chemical synthetic heli-spraying"
- Rejuvra helps with biodiversity but could have negative impacts.
- Mechanical tools (mowing and hand pulling) can be useful but for some weeds, herbicides seem like the only effective option.
- "I don't generally favor or use herbicides but I have been very impressed with the effectiveness of Rejuvra."

Other tools (mechanical, biological, cultural, controls)

- Would like to see more use of these tools, especially grazing (2).
- There are a lot of tools available. Each has pros and cons (balance of safety, cost, outcome)
- Full remediation takes a long time.
- Proper grazing would be more intensive, rotational, and regenerative.
- A lot of work goes into all this! Walking properties, hand pulling, monitoring, it's all a lot.
- There is a bug for bindweed!
- "I'm a beekeeper so I'm interested in controls that can co-exist. I also attempt to maintain 2 acres of land and I realize what an enormous task this county weed management must be"
- "I love that there are multiple tools used and which to use is analyzed in a thoughtful way."

Suggestions

- Share links to cheatgrass studies (used to justify herbicides) on Parks and Open Space website in the weed management area.
- Save more time on these tours for questions.
- Would be good to give attendees access to materials prior to the event.
- Help the public understand the science (as a process, not a body of knowledge).
- "The public distrusts some authorities because they believe, but don't actually know, they are funded by industry."
- "Explain (in detail!) the process/mechanism of application and how the herbicides work. This was answered but only after a question."
- "Be clear about the possible negative impacts of Rejuvra with the public. Say how you're dealing with them and why it's an important tool + show the other tools you use."
- Would be nice to learn more about why Rejuvra is so sensitive.
- Would like to be able to hear more about Joe's background, what he loves about his job, his favorite location in Boulder County, etc.
- Notify county residents (neighbors) when doing aerial applications since this is such a sticking point.
- Inform the public about the science of weed management.

Remaining Questions

1. What was indigenous here?
2. Want more information on HOW the County decides which weeds to control and how. What are the factors and considerations used to determine treatment?
3. Want more information on cheatgrass and fire. Asked for a specific expert and a selective reading of the literature.
4. What's in the weed management plan going forward.
5. How do I get insects to control bindweed?
6. I live adjacent to open space property. How can I get help to advise on my weed management efforts?
7. Are goats used in weed management here?
8. What sources do you use for your studies?
9. What obligations does BCPOS have to address the concerns of the public when developing this plan?
10. What good does all the weed control accomplish/achieve? Is this just a never ending game of whack-a-mole?

Other Comments

- This was so great! Would be cool to have more opportunities like this.

Next Steps

The following dates/events are planned to further this discussion:

- October 11: Open House to continue to learn more about these issues and explore possibilities
- October: Public comments will be collected online
- Dec. 21: Parks & Open Space Advisory Committee Public Hearing
- Jan. 23: Board of County Commissioners Public Hearing
- Feb. 15: Board of County Commissioners Decision (no public testimony)

Information will continue to be shared through the County's website. County staff are working to collect additional information and will try to answer as many of the participant questions as possible in the coming weeks and months.

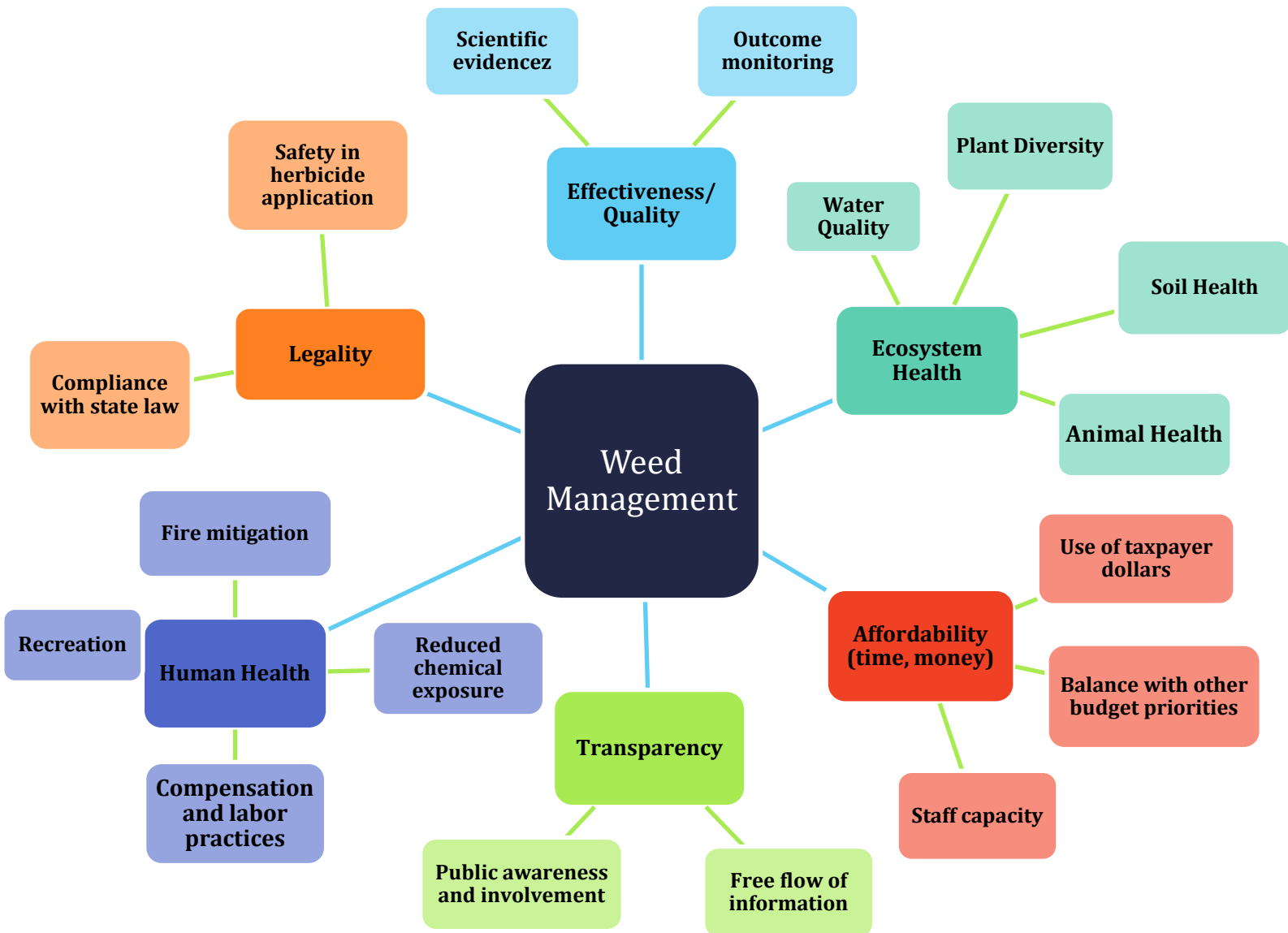
It was my pleasure serving you in this capacity. I sincerely appreciate the thoughtful, civil engagement of Boulder County residents on this topic. I look forward to hearing more about your outcomes and would look forward to supporting your needs and your community in the future.

Carrie W. Bennett
Facilitator

[Learning Through Difference, LLC](#)

Appendix A: Weed Management as an (emerging) Wicked Problem

In exploring complex issues like these, it can be helpful to use a Wicked Problem Mindset Through this mindset, the following values are beginning to emerge. Consider which values you prioritize over others and which other values may be in tension with your priorities.



Appendix B: Preliminary Questions

Before boarding the vans and visiting the identified sites, participants submitted questions (on index cards) which they hoped to have addressed through this process. All questions submitted have been listed here. In this section, questions are taken directly from the index cards with only minor edits for clarity. There was not adequate time or opportunity to answer all of the questions on the field trip. Staff responses are contained in a separate document.

1. What do County staff see as the biggest challenge in managing weeds on land the public has access to?
2. How do you keep County open space wild yet controlled?
3. Do you believe the earth is alive?
4. Does a 90% decline in birds and insects concern you?
5. What other IPM strategies does BCPOS use besides pesticide spraying?
6. Before there were humans, how did animals deal with problems of inequality in the ecosystem?
7. Please tell us more about sponsorship of Restore CO22--, POS Besos Earth Fund, Gates Family Foundation, but I mean locally within POS?
8. How do you choose which locations to prioritize for ecosystem management?
9. How did BCPOS "hit" it here? Foot soldiers of heli-dousing? What are the benefits of herbicides and costs in terms of ecological impacts?
10. What's the effectiveness of non-chemical weed killers like herbicidal vinegar or vinegar + Epsom salts and Dawn detergents? How is it best to apply those?
11. Why doesn't the Commissioner of Agriculture for Colorado promote cheatgrass to list B or A?
12. Did POS meet with the Department of Ag commissioner on cheatgrass?
13. Is cheatgrass a list A or list C species? Is it toxic?
14. Is there an elk overpopulation issue? Cheatgrass kills off elk food?
15. How does weed management interact with grassland fires?
16. Are costs associated with weed management better spent on wildfire mitigation?
17. How do County staff decide among alternatives when picking a weed treatment for a particular property?
18. What are the criteria for managing a particular species?
19. Why is smooth brome not managed as much as cheatgrass?
20. How does the county monitor the impact of its weed management work on flora and fauna?
21. Is Joe a fire marshal or volunteer fire fighter?
22. How does the County control for bindweed?
23. How many acres are under weed management?
24. As a volunteer naturalist who gives wildflower talks, what does the county want me to communicate?
25. What's the percentage breakdown of the usage of weed management tools? What % chemical, % mechanical, % cultural...
26. How practical is grazing as a County open space tool?
27. Can you explain "Integrated Pest Management?"
28. When will we hear about practices elsewhere in the county, state, and beyond?
29. What are the effective options for low to no chemical treatment of weeds? Especially for Colorado noxious weeds.
30. What are 1 or 2 strategies from this program we can adopt in our own backyards?



Boulder County Integrated Weed Management Plan Field Trip Questions and Staff Responses

As part of the outreach for the Integrated Weed Management Plan, the county offered three public field trips. Two of the field trips were offered through “Discover Boulder County” and led by an outside facilitator (Carrie Bennet, Learning Through Difference). The POSAC field trip was advertised through the POSAC mailing list. Each field trip had attendance of over 30 people. Staff drove county Youth Corps vans to and through the properties, gave short presentations, answered questions, and passed out comment cards. Responses to questions on the comment cards are contained in this document. The facilitator reports for tours conducted on July 25 and August 22 are separate documents.

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July 25, 2023 Integrated Weed Management Field Trip

Pierce and Monarch

Comment Card Questions + Responses from County Staff

1. Do we have capacity to push for more B list enforcement?

A full explanation of the County's efforts to manage different classifications of plants can be found under the "Eradication" section of the [Open Space Weed Management website](#). Under this plan, the County strives to contain B list species within its properties. Ongoing efforts are coordinated and implemented within the limits of available resources.

2. What are the underlying root causes of weed problems? What is the County doing to address the root causes?

The movement of people and animals are the primary drivers of plant dispersal. In some cases, people intentionally introduced certain plants to non-native ranges. Wildlife and domestic livestock alike disperse seeds which further spreads the plants. Disruptions of soil caused by land development, road construction, and more creates more opportunities for new plants to get established. Because noxious weeds are not native, biological controls like insects, disease, and animals that would limit their spread (in their native lands) are not present. Given this, noxious plants have an advantage over native plants and can out-compete native plants. Weed management efforts are focused on eradicating or controlling further spread of non-native plants so the problem doesn't get bigger. Many of these causes are not within the County's control to "fix."

3. Can we get pictures of wicked weeds to identify them at various growth stages and how to kills them?

Yes! The County maintains a [full list of Boulder County specific noxious weeds](#) online. From the website, follow the links to get more information about each plant as well as management/eradication suggestions from the Colorado Department of Agriculture and Colorado State University. You can also attend weed workshops hosted by [CSU Extension](#).

4. Do wicked weeds have a place in our ecosystem? Is it appropriate for a new wicked weed to replace in indigenous one?

Yes and no. Whether we like it or not, noxious weeds ARE a part of our ecosystem. In some places, some species of non-native plants have already significantly impacted native ones. Land managers relying on scientific research, seek to understand the impacts (positive and negative) of these plants and how to best manage them. Some noxious weeds can have powerful, negative impacts on human and environmental health (displacing food and habitat for native animals, consuming significant amounts of water, increasing the risk and intensity of wildfires, or poisoning livestock). In these cases, people have decided to take action to eradicate, or at least try to limit the spread of these plants.

5. Is it possible to have a successful weed management plan without using pesticides or chemicals?

Organic agriculture techniques demonstrate that it is possible to manage many weeds without the use of herbicides. Mechanical, cultural, and biological controls can adequately manage many weed problems. Many of these practices are more costly (labor intensive) than herbicide use, but consumers are willing to pay more for farm products raised using organic practices so producers can offset these added expenses. Some weeds are still extremely difficult to manage without herbicides. Bindweed, for example, is extremely difficult to eradicate through non-chemical means and even chemical control efforts are difficult. Non-agricultural land management and land management at large scale, makes the sole application of these non-herbicide practices more difficult. In Boulder County, the Parks & Open Space Department is responsible for 42,000 acres of land designated as natural areas, 7,000 acres of agricultural leased land that serves as wildlife habitat and 685 miles of county-maintained road right-of-way.

As an example, grazing can be an alternative to managing cheatgrass with herbicides. The County currently uses grazing as one of its tools for weed management. Trying to apply this tool, at scale, however, comes with a slew of challenges. These challenges are different in the context of open space natural areas compared to how grazing can be used in agricultural operations. If livestock are coming to a property having previously grazed on other weeds, they must be quarantined in a weed-free space for a period or they may bring in more weed seeds in their droppings. The simple movement of animals is one way that weeds are spread in the first place. Many open space properties do not have adequate fencing to support grazing. Adding fencing is costly and could impact the movement of wildlife. Portable electric fences that could be used to support rotational grazing practices require frequent monitoring and movement of the fences that are labor intensive. As recreation plays a large role on many open-space sites, conflicts between recreationalists and livestock/fence infrastructure can further complicate efforts. The coordination and timing of when to place animals in different locations and moving them to the locations is logistically challenging. In some cases, domestic livestock carry diseases that can spread to wildlife (e.g., domestic goats and sheep to big horn sheep) which can trigger a cascade of negative effects. Finally, some noxious weeds are actually toxic to livestock so extra care must be taken to ensure the safety of the animals when moving them to open space properties. For all of these reasons, while grazing has many benefits for weed management, it is logistically difficult and cost prohibitive to implement at scale.

While this is just one example, a similar pattern exists for other tools, mainly that the inputs of time and resources exceeds the County's capacity to successfully implement them at the scale necessary to control and eradicate many of the identified weeds. Whenever possible, management efforts intervene during different plant life stages to have the best chances of success and to use be able to employ the least expensive and least ecologically harmful methods available.

6. What resources are available to help a private landowner come up with a successful weed management plan?

[The Community Planning & Permitting Department](#) supports private landowners in implementing their own weed management plans. This is also the department that provides enforcement for weed management efforts on private property. Additional support for landowners is available through [CSU Extension](#).

7. How many years does it take for a weed management plan to start showing success? Is it less work over time?

The time it takes to see results varies widely by the site, management tools employed, and the specific plants being targeted. Other natural variables or disturbances (water, fire, wind, etc.) can also impact the time it takes for a plan to succeed (or fail). Some weed management tools have a rapid and lasting impact, others take more time or may need to be sustained year after year. Ultimately, the goal of all integrated weed management techniques is to have to do less over time. For A list species, eradication is possible. Once eradicated, efforts shift from eradication to monitoring. Similarly, with B list species, if the plant can be well controlled and does not spread, that means less intensive efforts may be necessary going forward.

8. Why is the field trip held now rather than when the weeds are in bloom and the grass shorter?

Hosting these field trips now allows for ready access to see the plants (it's not snowing or super muddy) and fits with the established timeline for delivering a revised plan to the County Commissioners. Plants in different stages of their lifecycles would certainly look different at an earlier or later time of year but we're hopeful that the landscapes, as they are now, adequately illustrate the results of past management efforts.

9. What invasive/non-native and listed weeds are managed and which are not managed?

By state law, land managers are mandated to work to eradicate List A species of plants and manage/control the spread of List B plants. There are not required management practices for List C or Watch List plants although the County may decide to intervene with these species. For a list of plants on each of the lists, see the [Boulder County plant identification and classification site](#).

10. How and when did the weed infestation arrive at the two sites we're visiting?

Many of the of the current noxious weed problems began prior to Boulder County ownership and management. Like many infestations across the county and state, disturbances such as overgrazing have allowed for noxious weeds to become established. Overgrazing can stress the native vegetation and allow noxious weeds brought in through many different pathways to become established. Some of these pathways are supplemental forage (hay), weed seeds sticking to livestock or wildlife fur or hair that eventually fall off on the site, bird droppings, and even seeds carried by vehicles on roadways that blow off randomly and become established.

11. What is the County doing to control all the curly dock that's taking over?

In some states this weed is considered a noxious weed, but Colorado is not one of them. Curly dock can grow up to about 5 ft tall if left unattended. It is one of the most widely dispersed weeds in the world. Curly dock is not currently a listed weed in the state of Colorado and Boulder County does not have management plans for Curly dock. However,

In some locations, or as part of other treatments curly dock is mowed or manually removed. The County must consider the costs and benefits given available resources when tackling unlisted weeds.

12. How can you eradicate curly dock?

Curly dock can be eradicated with herbicides or through manual controls (digging). Curly dock roots go deep into the soil so it can be difficult to remove the entire root. At least 75% of the root must be removed or the plant can re-grow. Each curly dock plant can produce thousands of seeds and the seeds can remain viable in the soil for a very long time. For more help with home weed management the [CSU Extension, Master Gardener Program](#) has extensive information.

13. Are curly dock and woolly mullein lost causes?

It is unlikely that Boulder County will eradicate either of these plant species on a large scale in the foreseeable future, but successful control can be achieved on a smaller scale depending on management objectives.

14. Are landowners who have an outbreak notified by the county?

Yes and no, the <https://bouldercounty.gov/property-and-land/land-use/noxious-weeds/Community Planning & Permitting Department> is responsible for monitoring weed management on private property. As with many County departments, staff resources may be a limiting factor.

15. Who is in charge of roadside invasions?

County Road rights-of-way mowing is managed by the County noxious weed department and is part of the County's integrated weed management plan. Roadside management is often more about motor vehicle and pedestrian safety by providing clear sight lines at intersections and pedestrian crossings and keeping signage visible than noxious weeds. , Mowing vegetation back from the edge of the roadway also allows motorist to see wildlife before they enter the road and provide cyclists the ability to stay closer to the of roads and out of traffic lanes. Boulder County does have a responsibility to maintain noxious weeds along roadway corridors to prevent further distribution of noxious weeds and their encroachment onto private property.

16. What works in controlling/managing invasive plants? Especially teasel, Canada thistle, and creeping thistle? Are there multiple approaches?

There are indeed multiple approaches that can be used to manage each of these species and the most successful management occurs when multiple methods of control are used. For specific management techniques, look for the plant in question on [full list of Boulder County specific noxious weeds](#) online. From the website, follow the links to get management or eradication suggestions from the Colorado Department of Agriculture and Colorado State University. You can also attend weed workshops hosted by [CSU Extension](#) or from the [CSU Extension, Master Gardener Program](#)

17. How does the County use volunteers in weed management (2)? Do you encourage community groups to work independently after training?

Yes! Noxious weed management is one of the more popular volunteer activities. The County organizes multiple events as well as ongoing opportunities for volunteers to engage and support weed management efforts. For more information, see the [County Parks & Open Space Volunteer Information](#)

18. What is the cost/benefit analysis done prior to implementing management (especially before applying herbicides)?

Staff utilizes an integrated pest management approach to controlling weeds that include mowing, hand pulling, insect bio-control, cultural control (tilling weeds and planting desirable vegetation), and herbicide application. Herbicides are only used in targeted areas. When controlling noxious weeds on open space properties, staff are careful to use the least damaging and most effective weed control strategies available. Staff always consider the local ecology to maintain and support the rich ecosystems of open space lands. Specific considerations include the size of the area to be treated, the life cycle and biological characteristics of the targeted plants, topography, water, and other local conditions

19. What steps are taken to ensure ecological safety of pesticides or herbicides?

All weed management tools have some downsides and negative impacts. Public concern over ecological harm from pesticide and herbicide applications are the most intense. Before products can come to market, they undergo significant testing and risk assessment. These are used to regulate the uses and guide application guidelines to mitigate potential risks. Boulder County staff follow these guidelines to minimize risks. Staff keep up to date on research and science so as new information comes to light, appropriate adjustments can be made. Even so, staff understand that herbicide application is not risk-free.

In 2020, the United States Forest Services published the results of a [Human Health and Ecological Risk Assessment \(HHERA\) on indaziflam](#), the active ingredient in Rejuvra. Conclusions from this extensive assessment are all included in the executive summary. Based on the results of rigorous scientific study, the County has deemed the use of indaziflam as an appropriate weed management tool. Applications are limited, well planned, and implemented according to the product labeling.

20. Is the County doing their own testing (monitoring)?

At this time, monitoring focuses on outcomes from weed management efforts. Most resource management work groups (wildlife, forestry, ecology, noxious weeds, etc.) conduct monitoring activities. Research opportunities in cooperation with academic research institutions through the County's Small grant research opportunities, the County monitors plant and animal abundance and diversity in targeted locations.

21. Is Boulder County Health involved with runoff concern as they are with compost production?

Not at this time.

22. How can a person learn more about the County's weed management practices?

The most up-to-date information about the County's weed management practices are on the [Boulder County Noxious Weeds & Invasive Species Management webpage](#).

23. Is the County hiring local farmers to graze as a tool to control weeds? What does that look like?

The County currently leases close to 7,000 acres for grazing which are also considered wildlife management areas. Grazing leases are managed by the County's Ag Division and are managed to maintain the health of the rangeland. Maintaining a healthy rangeland system can help suppress many noxious weeds and prevent new weed infestations from establishing. The noxious weed management group currently assists the Ag Division and the Wildlife group with rangeland management through large scale field mowing, releasing biological controls and some limited herbicide applications. However, most weed management is conducted by the ag tenant. At this time, the County does not pay farmers to graze livestock for weed control.

24. What does the public want done in weed management? What are the public values around weed management?

We are learning about the public's priorities through this very process.

25. When are chemicals (herbicides) used as a part of weed management?

Herbicide applications are used to control noxious weeds when they are on balance the most practical tool. Criteria for herbicide use include size and location of infestation, other species characteristics (e.g., plant phenology or growth cycles), terrain characteristics (such as slope steepness, rockiness of terrain, proximity to water, likelihood of runoff), efficacy, worker safety, environmental impacts, timing and cost of application, resistance concerns, and alternatives available. In comparison to other methods, herbicide treatments can be relatively cost-effective for large scale infestations. Depending on the management objective sometimes herbicides are the only method used to control noxious weed species (i.e., List A Perennial Species that need to be eradicated) and sometimes they are not used at all (i.e., newly seeded restoration areas) To assist in herbicide selection, staff relies on research data provided by Cornell Universities Environmental Impact Quotient (EIQ) calculator. Appendices E and F contain more detail on the herbicides utilized by Boulder County and other herbicide selection resources.

26. How can you control weeds (bin weeds) in a garden spot? Pulling forces the roots to go deeper. Weeds can over take over plantings.

For the best information on home garden weed management, please see resources from the [CSU Extension, Master Gardener Program](#). The same tools (mechanical, biological, cultural, and chemical) are available to home gardeners as they are to the county. However, the home gardener's time and resources, along with the smaller scale and intensity of home weed management, may make the "best tool" for a given weed different depending on the land manager.

July 27 Integrated Weed Management
POSAC Field Trip, Rabbit Mountain
Comment Card Questions + Responses from County Staff

- 1. What can you tell us about what has happened at these sites (tonight and impacted OS sites in general) in terms of degradation? I'm especially curious about erosion, soil loss, desertification, changes in which animals have been and are using these sites and their impacts?**

Rabbit Mountain: Staff has not looked at soil erosion, soil loss or desertification at this time. However, where soils are concerned, studies have been or are being conducted on the following, Rejuvra treated vs. untreated, side-by side studies, looking at soil microbe properties, soil moisture properties, and a soil carbon study (Nov. 2023, Boise State). Staff has monitored changes to ecosystem structure, ecological services, and wildlife use by using side-by-side transects located in treated cheatgrass sites vs. untreated sites. This monitoring includes, vegetation species diversity, mule deer utilization, shrub health in terms of browse production, vegetation biomass production, flower counts per plant; annual, short lived and monocarpic species, rare or uncommon species, georeferencing plant species densities and cheatgrass thatch degradation. Studies that have been completed consist of a peer reviewed pollinator study and small mammal study. We are currently in the process of other data being submitted for peer reviewed research. Anecdotally, we have also witnessed more native ground nesting bird on treated sites as well. Plant Monitoring is occurring on 16 different sites and shows consistent, positive results across all sites.

- 2. What other agencies or government agencies are using Rejuvra and for how long?**
 - Jeffco and Larimer County have recently started to employ the use of Rejuvra. Both have had completed smaller applications and some trials on areas to measure the changes and have a better understanding of what changes can occur. Larimer County like Boulder County was part of early trials conducted by CSU.
 - The USFS in 2020 completed a Human Health and Ecological risk assessment of indaziflam (Rejuvra) and has had it approved for applications. They have recently just hired a specialist to oversee Rejuvra applications on USFS land here in Colorado.
 - Sublette County Wyoming, Wyoming Weed and Pest has been actively applying Rejuvra for several years. They have been a leader in grant funding and forming interagency agreements across, county, federal and private landowners for wide area treatments of cheatgrass and potentially other winter annual invasive grasses. Sublette Wyoming also maintains the largest areas and populations of the threatened sage grouse in Wyoming which continues to have their habitat

overtaken by cheatgrass and further harmed by the more frequent fires that occur.

- The BLM is currently in the process of approving Rejuvra for use on BLM lands for the control of winter annual invasive grasses.
- Private ranch/range managers are also beginning to utilize Rejuvra to restore the production of their grazing. Some grazing studies

3. **Is there a leader in weed management amongst county governments?** Due to the nature of Boulder County's early controlled treatments and consistent, continuous monitoring (8 years on some sites) Boulder County is recognized as one of the agencies on the forefront of understanding Rejuvra. Boulder County staff has been requested to present at annual conferences for Western Society of Weed Science, North American Invasive Species Management Association, Society of Ecological Restoration, The Gunnison Sage Grouse Conservation Conference, and others. **Other states?**; Wyoming's Sublette County would also be a strong leader as well as some other counties in Wyoming.

4. **Has POS researched other county weed management plans from communities that have similar landscapes in the west?** Yes. The weed staff has reviewed several weed management plans from our neighboring counties with similar OS programs. Staff has also reviewed the Midpeninsula Open Space District (CA) Weed Management Guidance Plan as well as Chaffee, Weld and Archuleta Counties.

5. **How extensive is the herbicide testing? Bees fed rejuvra vs. long term genetic changes or reproductive interruption/disease (think Rachel Carson long term effects)**

According to resources provided by Lisa Blecker, CSU,

- a. In 2011, EPA began expanding the risk assessment process for bees to quantify or measure exposures and relate them to effects at the individual and colony level. This involved identifying additional data that would be needed to inform that process. These data are summarized in the table below.
- b. In November 2012, EPA, in collaboration with Health Canada's Pest Management Regulatory Agency and the California Department of Pesticide Regulation, presented a quantitative risk assessment process for bees and other insect pollinators to the FIFRA Scientific Advisory Panel.
- c. EPA has begun to employ its new risk assessment framework for bees as part of its regulatory decision-making process for all pesticide chemistries. The new framework:
 - i. Relies on a tiered process. :
 - ii. The lowest tier (Tier I) is intended to serve as a screening tool. It employs conservative assumptions regarding exposure (i.e., assumptions that are likely to overestimate exposure) and uses the most sensitive toxicity

estimates from laboratory studies of individual bees to calculate risk estimates.

- iii. Higher tiers (Tiers II and III) rely on characterization of risk based on measured exposure values and colony-level effects studies and so are more realistic.
 - iv. Focuses on the major routes of exposure, including contact exposure (e.g., from overspray or direct contact with the pesticide on the plant surface) and dietary exposure (e.g., from consumption of contaminated pollen or nectar).
 - v. Distinguishes different types of pesticide treatments, such as compounds applied to plant leaves or seed/soil-applied (systemic) compounds.
- d. Further resources can be provided upon request.
6. **How much do the various “tools” in the toolbox cost to implement? This is being review How can we do relative cost analysis?** This is being presented the IWM plan. We are also working on a table of relative commercial costs for various methods of management tools. Grazing, Field mowing, aerial application, ground application, weed whacking.
7. **Why does leadership of POS not believe the top experts in the field on how to manage weeds naturally? They are professors, with decades of experience in cheatgrass and fire (one wrote 11 papers on it). They don’t believe what these experts say – cheatgrass is List C, not a fire hazard (any more than any other substance). Isn’t, spreading, isn’t taking over. Elk and deer feed! They eat it in winter in fact.** Staff is happy to review any peer-reviewed studies if references are provided.
8. **What percentage of Rabbit Mountain has noxious weeds?** Boulder County has not conducted a noxious weed survey in recent years.
9. **Cheatgrass: will cheatgrass in Boulder County decline without intervention? Any studies?** Cheatgrass populations may ebb and flow in cycles, but generally does not decline without intervention.
10. **What it the decision process/including cost/benefit for deciding when and where to control invasive weeds? Not just the Sate’s A, B, C, Lists.**
Section 2.3 + story map

August 22 Integrated Weed Management Field Trip

Rabbit Mountain, Dowe Flats

Comment Card Questions + Responses from County Staff

1. **What do County staff see as the biggest challenge in managing weeds on land the public has access to?** Amount of land, staffing, time, and physical access.
2. **How do you keep County open space wild yet controlled?** The county's emphasis is to maintain and restore native ecosystems and ecological functions that provide the best opportunity to sustain our wild places.
3. **Do you believe the earth is alive?** Yes.
4. **Does a 90% decline in birds and insects concern you?** Yes. The largest cause of bird and insect decline is loss of habitat.
5. **What other IPM strategies does BCPOS use besides pesticide spraying?** The four categories of an IPM are Cultural, Mechanical, Biological, and Chemical.
6. **Before there were humans, how did animals deal with problems of inequality in the ecosystem?** Ecosystems are always in flux and change is constant. The best way to understand how ecosystems respond is through concepts such as succession or disturbance ecology. The abilities of humans to quickly move about the globe has led to introduction of invasive species that have a competitive advantage over native species. This has had the tendency to completely change the trajectory of these ecosystems and lead to habitat loss.
7. **Please tell us more about sponsorship of Restore CO22--, POS Besos Earth Fund, Gates Family Foundation, but I mean locally within POS?** National Fish and Wildlife Federation is the funding organization.
8. **How do you choose which locations to prioritize for ecosystem management?** Priority areas usually begin with the least ecologically disturbed sites. These sites require the least amount of effort, and we can prevent further degradation. It is the moderately disturbed sites that that we spend the most time on. These sites are recoverable with an IWM approach and restoring native ecosystems functions can be accomplished. Some sites, such as former agricultural properties, prairie dog sites, are degraded to a degree that restoration requires much more time and effort. These areas have a much longer-time horizon for restoration.
9. **How did BCPOS "hit" it here? Foot soldiers of heli-dousing? What are the benefits of herbicides and costs in terms of ecological impacts?** Herbicides can be far more cost effective than other strategies. They require less site disturbance while minimizing the

opportunity for other noxious weeds to germinate, can be targeted to individual plants with no off-target concerns. Ecological impacts can be minimized through use of tools for herbicide selection.

10. **What's the effectiveness of non-chemical weed killers like herbicidal vinegar or vinegar + Epsom salts and Dawn detergents? How is it best to apply those?** All weed killers are chemical in nature. Many of these remedies are chemicals being used outside of the use they were intended for and may cause environmental damage. Many weed killers that are thought to be organic (i.e., 30% agricultural vinegar) and a safer alternative to synthetic herbicides are not regulated by the EPA. Their impacts on the environment are relatively unknown because they do not undergo the formal human health or ecological studies required of synthetic herbicides. Many require follow-up treatments all season long as they burn the plant down but do not kill it.
11. **Why doesn't the Commissioner of Agriculture for Colorado promote cheatgrass to list B or A?** List A species are for eradication and cheatgrass levels across the state would exceed criteria for putting it on that list. Staff is unsure if the Commissioner or State Weed Coordinator would consider making it a List B species based on populations levels across the state. But individual land managers can manage for it and many do.
12. **Did POS meet with the Department of Ag commissioner on cheatgrass?** No.
13. **Is cheatgrass a list A or list C species? Is it toxic?** Cheatgrass is a list C species
14. **Is there an elk overpopulation issue? Cheatgrass kills off elk food?** The main issue with our elk populations is that they do not migrate seasonally due to easy access to private ag lands for food and shelter. Typically, elk herds move to higher elevations during summer months and then move to lower elevations during winter months. This seasonal movement spreads out the herbivory across the landscape rather than focusing it on one location. Cheatgrass is only a palatable species for a short window to elk and deer while they prefer native grasses and shrubs. Cheatgrass outcompetes many of these native grass species and steals nutrients from many of the other native shrubs and plants.
15. **How does weed management interact with grassland fires?** Grasslands evolved primarily under grazing and fire. In a healthy grassland ecosystem, fire is essential to its health and maintenance. However, if the grassland is not in a healthy state fire can harm or displace native vegetation with more aggressive invasive plants that can often establish much easier post fire. In the case of cheatgrass, fire can become more erratic. Fires can burn hotter, with longer flame lengths, cause shrub mortality, work as a ladder fuel to fire into lower branches of trees and cause general ecosystem harm.
16. **Are costs associated with weed management better spent on wildfire mitigation?** These are two separate concepts. Weed management is primarily focused on removing invasive

noxious weeds that displace native ecosystems. Sometimes (as in the case of cheatgrass) we can see secondary or complementary benefits from control such as wildfire mitigation.

17. **How do County staff decide among alternatives when picking a weed treatment for a particular property?** Boulder County relies on best practices and scientific evidence to inform weed management. Integrated weed management tools and practices are carefully selected based on the required state management guidelines for specific List A, B, and C species (eradication, suppression, or elimination), the size of infestation (i.e., single plant to large monoculture infestations), location (i.e., critical habitat, riparian areas, sensitive areas, etc.) and known best controls for individual species.
18. **What are the criteria for managing a particular species?** List A species are managed for eradication wherever they are found per state law. List B Species are managed for containment, meaning, you try to prevent or not allow them to flower. The state also maintains suppression or elimination zones by county for many of these species, to help prevent further spread or greater infestations. They are all enforceable for control through state law. In general List C species are recognized as having broad negative effects, however, their broad spatial distribution is such that elimination is not feasible, thus management is “as needed,” and up to individual landowners.
19. **Why is smooth brome not managed as much as cheatgrass?** Smooth Brome while being an introduced species, and a species that can overrun native vegetation, has often been seeded as a grazing alternative or a roadside revegetation in the past, because it is easy to establish. As a forage it does have economic value for livestock managers.
20. **How does the county monitor the impact of its weed management work on flora and fauna?** Through monitoring of treatments made and working with our Plant Ecology group, which also conducts monitoring of sites across open space.
21. **Is Joe a fire marshal or volunteer fire fighter?** Joe is not currently a fire marshal or volunteer fire fighter but has conducted prescribed fire on thousands of acres in the Flint Hills as a range manager in past land management positions.
22. **How does the County control for bindweed?** Bindweed being a very hardy perennial plant is usually treated with an herbicide. Timely applications can be very effective. There is also a biological control that has shown some efficacy to help suppress field bindweed and assist in its suppression.
23. **How many acres are under weed management?** Boulder County Parks & Open Space manages weeds on 42,000 acres of natural areas and 7,000 acres of rangeland.

- 24. As a volunteer naturalist who gives wildflower talks, what does the county want me to communicate?** Thank you for being a volunteer naturalist! We appreciate your help communicating the serious impacts of noxious weeds to native ecosystem values and the complexity of effective weed control.
- 25. What's the percentage breakdown of the usage of weed management tools? What % chemical, % mechanical, % cultural...** The breakdown of this information changes from year to year based on many different factors. Weather, size of staff, equipment breakdowns, etc. all can have significant impacts. It can also vary widely depending on the weed species that may be more dominant on the landscape. It is further complicated by the fact that many sites receive more than one type of treatment. So far this year (as of Sept. 14, 2023), 8,886 acres have been treated for weeds. Herbicides have been applied to 173 acres and 4,200 acres have been treated mechanically.
- 26. How practical is grazing as a County open space tool?** The county ag program currently uses grazing leases for approximately 10-12 acres of county owned open space, and grazing and is very practical at these areas. However, due to fencing needs, water availability, and other concerns, grazing as a weed management tool on a larger scale is severely limited.
- 27. Can you explain "Integrated Pest Management?"** Weeds come under the general category of pests. Integrated weed management is the planning and implementation of a coordinated program utilizing a variety of methods and tools to manage noxious weeds to achieve specified management objectives (control, suppress, contain, eradicate) and promote desirable plant communities. Such methods may include, but are not limited to, education, preventive measures, good stewardship, and the tools include biological, cultural, mechanical, and chemical controls.
- 28. When will we hear about practices elsewhere in the county, state, and beyond?** See the POSAC memo for Sept. 28, 2023, for an overview of peer agency weed management practices and links to peer agency web pages.
- 29. What are the effective options for low to no chemical treatment of weeds? Especially for Colorado noxious weeds.** Effective weed management depends on a variety of factors and vary by weed species and site. The Integrated Weed Management Plan and accompanying Story Map provide information on treatment decisions and examples.
- 30. What are 1 or 2 strategies from this program we can adopt in our own backyards?** The best strategy is prevention! But once a weed infestation is established, a rapid response is the best strategy. The response will depend on type of weed and site conditions. CSU Extension has a variety of resources for homeowners.