



# Parks & Open Space

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## PARKS & OPEN SPACE ADVISORY COMMITTEE MEETING

Time/Date of Meeting: 6:30 p.m., December 5, 2023

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

<b>TO:</b>	Parks & Open Space Advisory Committee
<b>FROM/PRESENTER:</b>	Justin Atherton-Wood, Planning Work Group Supervisor
<b>AGENDA ITEM:</b>	Integrated Weed Management Plan Study Session (please note: no public comment will be taken as part of the study session)
<b>ACTION REQUESTED:</b>	<b>Information and Discussion</b>

### Introduction

The purpose of this memo and study session is to review community survey results for the draft Integrated Weed Management Plan (IWMP), present modifications BCPOS Staff is proposing in response to this input and solicit feedback and recommendations from POSAC on proposed integrated weed management actions. The study session format enables a less formal and potentially more in-depth discussion with POSAC members about policy options. Staff will return in January with a final proposal for the IWMP responsive to the discussion with recommendations from POSAC. Public input will be welcome at the January meeting.

### Background

On October 2, 2023, Boulder County Parks & Open Space (BCPOS) posted an online survey in conjunction with the Draft IWMP and companion story map. The survey closed on October 19, 2023. The survey referenced the IWMP and companion story map and consisted of eight questions. Questions 1 through 7 were designed to gauge opinions about weed threats, weed contributions to wildfire risk, and a range of weed management practices. Question 8 was an open-ended question about weed management. The survey was not designed to be a statistically valid poll of the community's support of the plan. Rather, it was intended to serve as a public engagement tool for input into the update process and gain feedback on the draft IWMP. See **Attachment A** for the full report.

### IWMP Survey Responses

The survey received 1,076 responses. 39% of respondents live in Boulder; 20% live in Longmont; 13% live in unincorporated Boulder County; 8% live in Lyons; 6% live outside of Boulder County. Other demographics are in the report.

Overall, while many respondents agreed that weeds pose a threat to ecosystem health and biodiversity, most respondents expressed opposition to the use of herbicides as a means for controlling weeds, including through aerial spraying. Specific results of Questions 1 through 7 are summarized below. This memo also provides detailed discussion of the nine themes identified by the public under Question 8.

## Summary of Responses to Questions 1 through 7

Ecosystem health and biodiversity: 54% of respondents agree (33%) or strongly agree (21%) that weeds pose a threat to ecosystem health and biodiversity, and 43% agree (26%) and strongly agree (17%) that weeds pose a fire risk in Boulder County. (Question 1 and 2).

Integrated Weed Management strategies: Between 66% and 81% of respondents are concerned about the use of herbicides as a weed management tool across a range of proposed strategies:

- 81% agree (14%) or strongly agree (67%) with the statement “No herbicide use at all; the potential negative effects are too great. Use other treatments only (e.g., mowing, grazing, hand pulling, biological agents).” (Question 3)
- 69% disagree (27%) or strongly disagree (42%) with the statement “Follow an integrated approach using all available treatment tools to eradicate weeds, including herbicides, following best management practices to minimize negative effects.” (Question 4)
- 66% disagree (24%) or strongly disagree (42%) with “Strategic, targeted use of herbicides along with complementary treatment tools to comply with state law to eradicate List A weeds and contain and suppress List B and C weeds, as illustrated by the case studies in the Story Map.” (Question 5)
- 75% disagree (21%) or strongly disagree (54%) with the statement “Targeted herbicide use as the primary tool for eradication of noxious weeds to maximize the ecological restoration benefits of this treatment method, acknowledging they are EPA approved and have demonstrated effectiveness with minimal negative effects.” (Question 6)

Aerial Spray Policy: Similarly, survey respondents have concerns about the proposed Aerial Spray Policy (**Attachment E**), which now proposes infrequent herbicide application by helicopter with 1/4-mile buffers and additional conditions. A total of 84% of respondents strongly oppose (73%) or oppose (11%) aerial spraying by helicopter; opposition to the use of drones was slightly less (81%). (Question 7). See below for detailed discussion of concerns about aerial spray applications under Theme No. 3.

## Nine Themes from the Open-Ended Comments

Open-ended comments were received in the survey in response to Question 8, which read, “Please share any additional thoughts about weed management.” This question received 555 responses. Boulder County hired Circuit Media to categorize these responses. Circuit Media identified nine themes based on key words or phrases appearing multiple times within the responses (five or more responses). See **Attachment A** for discussion of the themes as well as all verbatim responses. This section provides staff responses to these concerns.

### 1. Concern for Chemical Herbicide Use

Staff Response: Staff shares the public’s concerns about overuse of chemical herbicides and advocates for targeted, selective use of a limited range of herbicides where and when appropriate. We are experiencing a global crisis of declining biodiversity and need all available tools to fulfill both our legal obligation to manage noxious weeds and our program mission to protect ecosystem health and biodiversity. Noxious weeds also significantly increase the risk of wildfire (refer to research cited in **Attachment B**).

- As described in Section 2 below, staff is proposing using the World Health Organization’s pesticide assessment tool to determine which herbicides BCPOS may use. This tool will minimize the risk to public health and safety and protect overall biodiversity. Staff will also continue to extensively use biological, cultural and mechanical control.

- List A species control: State law requires landowners to eradicate List A species. BCPOS uses all tools to accomplish this. Without limited herbicide use, BCPOS would be in violation of state law.
- List B species control: 18 of 38 species on List B are designated by the state for eradication within Boulder County. Another 17 species are designated to be contained to their existing range with some zones targeted for elimination within Boulder County. Maps prepared by the state indicating required weed management objectives are included in **Attachment C**. These maps illustrate that just 3 species are designated for suppression- only county-wide, while 15 require eradication in at least some parts of Boulder County in order to prevent their expansion into new areas.
- List C species control: The state doesn't mandate but rather recommends management of List C weeds for protecting ecosystem health and biodiversity.
- BCPOS manages lands currently in a degraded state due to natural disaster or impacts from previous uses such as gravel mining or mismanaged agricultural practices. List C species and other invasives species often infest these sites and hinder ecological restoration. Projects such as Prairie Run (East Boulder Creek) need intense weed management for restoration to be successful. State, County, and Federal agencies often require native plant establishment and as part of the construction permitting and/or funding agreements. Weed management is integral to achieving the required native species establishment.
- If BCPOS stopped using all herbicides, we would be in violation of state law, and due to the costs and impracticality of using non-herbicide treatment solutions exclusively, we would see an increase in noxious weeds and a decrease in overall ecosystem health and function on county open space lands.

## 2. Support for herbicide use

Staff Response: We appreciate the community's understanding that noxious weeds threaten our native ecosystems and increase wildfire risk. We also heard through public comment that they would like a systematic and transparent approach for determining which herbicides BCPOS uses.

- The World Health Organization (WHO) is the United Nations agency that uses science to promote public health. Their "Recommended Classification of Pesticides by Hazard" report analyzes pesticides and ranks their safety. Pesticides are divided into 5 tables, with Table 1 being the most toxic and Table 5 being the safest. Staff proposes to use their safety assessment to determine which herbicides BCPOS will use. BCPOS will only use herbicides in Table 4 (slightly hazardous) and 5 (unlikely to present acute hazard in normal use). see **Attachment D** for herbicide selection criteria and for a table of the herbicides that meet the selection criteria that BCPOS recommend for use on BCPOS lands.
- Using the WHO criteria, BCPOS will remove the following herbicides from use:
  - 2,4-D, Dicamba, Triclopyr, and Mecoprop.
  - Additionally, Picloram will be removed because it is registered as restricted use in Colorado.
- Glyphosate is on the WHO list and therefore remains on the Boulder County list.
- Using a standardized, thoroughly vetted and publicly available list of approved herbicides meets the public's request for a system and transparency. This approach will also allow BCPOS to quickly respond to any new weed infestations and minimize the chance for herbicide resistance to develop.

## 3. Concerns About Aerial Spraying

Staff Response: Aerial application will be used sparingly and only for wide-spread weeds that threaten ecosystem health. BCPOS will assure applicators are licensed and follow all Colorado State Law to

assure there is no drift onto adjacent lands. We are also proposing to increase the buffer size from our original plan from 1/8 mile to ¼ mile.

- BCPOS is monitoring 28,000 acres of BCPOS lands that are vulnerable to severe cheatgrass infestations which negatively impact biodiversity. These cheatgrass management zones are located primarily along the county's western foothills and in the county's southern grasslands. To date, BCPOS has used aerial application for cheatgrass control on 1,985 acres primarily in the foothills and an additional 2,315 acres have been treated with ground equipment primarily in the southern grasslands. This is a total of 4,300 acres. POSAC has had the opportunity to view the results of some of these treatments. BCPOS has identified approximately 3,000 cheatgrass-infested acres on the Northern Foothills properties (Hall, Heil, Trevarten, et al), Rabbit Mountain, Betasso Preserve, and Walker Ranch where aerial application would provide effective control. Conducting aerial applications in these areas would support the department's overall restoration efforts that favor biodiversity and support ecosystem health of these lands. These are the only areas being considered for aerial herbicide applications at the present time.
- Drone technology has greatly advanced and is rapidly being accepted as an efficient, accurate and sustainable method for the aerial application of herbicides. BCPOS proposes using drone technology within the quarter-mile helicopter buffer area and other appropriate areas to treat cheatgrass and other noxious weed infestations.
- See **Attachment E** for updated Proposed Aerial Spray Policy.

#### 4. Environmental Concerns

Staff Response: BCPOS recognizes there are environmental concerns with herbicide treatments to control noxious weeds and shares this concern. For this reason, BCPOS utilizes multiple best management practices to minimize risk to the environment. First, BCPOS applies herbicides using approved label instructions and by using best management practices. Second, by using the WHO criteria to select herbicides, environmental factors including persistence (criteria 5), ozone layer depletion (criteria 7), and severe or irreversible environmental damage (criteria 8) are considered. Third, much of BCPOS's herbicide use is for spot treatments of individual plants or very small populations. This greatly limits the amount of herbicide that is used by BCPOS overall. Finally, BCPOS consults tools such as EIQ-FUR and Bee Traffic Light when considering the rates to apply ensuring the impact is low.

#### 5. Alternative Methods of Weed Control

Staff Response: BCPOS currently uses a variety of mechanical, cultural and biological control practices as part of the Integrated Weed Management program. We use more of these methods than herbicide application. Going forward, BCPOS intends to continue to use these tools and to pilot other tools outlined below in order to continue to minimize the need for herbicide.

- To support BCPOS's goal of restoring healthy ecosystems on open space, BCPOS uses mowing, hand-pulling (both mechanical), insect releases (biological) and planting competitive native plants (cultural). In 2021, these practices accounted for 67% of the entire area treated for invasive weeds, a total of 5,680 acres. By comparison, only 33% of the entire treated area had herbicide utilized, a total of 2,800 acres.
  - In 2021 BCPOS used:
    - Monitored 1,710 acres,
    - Mowed 890 acres,
    - Manually controlled 3,080 acres; and,
    - Completed 6 releases of biological control agents (insects).
  - For POSAC's reference and consideration, a "Cost of Weed Management Tools" table is attached as **Attachment F**.

- BCPOS is in discussions with the Boulder County Office of Sustainability, Climate Action and Resilience (OSCAR) to pilot use of alternatives to herbicides and evaluate their effectiveness and carbon footprint.
- Steam weeding pilot. BCPOS is in the process of identifying some trail head sites for a pilot project. Trailheads are especially suitable to testing this technology.
- Soil Amendments. BCPOS is in the process of identifying sites for a soil amendment pilot and will do a comparison to a control site.
- Grazing. BCPOS can use grazing in very limited areas because of cost, fencing, and logistics of providing water. Grazing is not suitable in several of our open spaces because domestic sheep can transmit lethal pneumonia to wild Big Horn Sheep (link to CPW report: <https://cpw.state.co.us/Documents/WildlifeSpecies/Mammals/ColoradoBighornSheepManagementPlan2009-2019.pdf> )

## 6. Health and Safety

Staff Response: By using the WHO criteria and removing herbicides in the moderate or higher risk categories, we are addressing public health and safety. In addition, continued emphasis on spot spraying and use of cultural, biological and mechanical controls further minimizes health and safety risks.

- The WHO Criteria looks at acute toxicity (criteria 1) as well as chronic health toxicity using carcinogenicity (criteria 2), mutagenicity (criteria 3), and reproductive toxicity (criteria 4). Refer to **Attachment D**.

## 7. Community Involvement and Outside Expertise.

Staff Response: BCPOS is constantly engaging with experts in the field of weed management and natural areas management to ensure our land management practices are informed by the latest science and best management practices. This includes engagement with peer biologists and ecologists on our own staff, staff of land managers at the local, regional and state levels, fellow members of national professional associations, and researchers at various universities and other institutions. We sought feedback from many of these peers on the draft IWMP to ensure our management practices aligned with practices occurring in the greater community. In addition, many of these peers attended the recent open house to share their expertise with members of the public.

The IWMP is currently in the middle of a public process to ensure that the community is also involved in shaping the IWMP. Opportunities for community involvement are being provided through site tours, a range on POSAC presentations from staff and other experts, a community survey on the draft plan, and hearings with POSAC and the Board of County Commissioners.

- BCPOS weed manager staff are members of several key professional associations. These professional organizations have hundreds of experts from throughout the state and the west from universities and land management organizations. They have annual conferences and periodic webinars that address pressing weed management topics and the latest science on weed management. The organizations that BCPOS staff are actively involved with include:
  - The Colorado Weed Management Association (<https://cwma.org/>),
  - Western Society for Weed Science (<https://wsweedscience.org/>),
  - Western Science Society of America (<https://wssa.net/>),
  - Society of Ecological Restoration (<https://www.ser.org/>)
  - Society of Range Management (<https://rangelands.org/>), and;
  - North American Invasive Species Management Association (<https://naisma.org/>).

- BCPOS solicited peer review of the draft IWMP from several other land managers/weed scientists and have incorporated their feedback into the document.
- BCPOS also partners with local researchers who have studied weed management and restoration on open space. There are 37 research reports that include weed management conducted on BCPOS lands in the past 20 years. <https://bouldercounty.gov/open-space/education/research/> (use the search word “weeds”).

## 8. Request for More Research

Staff Response: As mentioned above, BCPOS has been supporting research on county open space related to BCPOS’s land management. Two recent studies pertain specifically to BCPOS’s weed management practices. The findings are summarized below. Future studies are planned and in process.

- The most recent study compared the soil structure and biology between cheatgrass infested areas that were treated Rejuvra to areas left untreated (*Plant and Soil Microbial Community Composition Legacies Along A 5-Year Time Series Gradient Post-Indaziflam (Rejuvra™) Herbicide Treatment*; Ember Bradbury, Amy Gill, and Caroline A. Havrilla, 2022). See Attachment B, p. 5.
  - Results showed about the same number of microbes in both plots – thus there is not a killing of the soil biology.
  - In the treated plots, there was a shift in the types of microbes to one that helped metabolize nitrogen.
  - There were more actual numbers of microbes in the treated plots.
  - There was more nitrogen available in the treated plots.
- A second study evaluated pollinator response to Rejuvra treated lands. This study found that pollinators were more abundant in the Rejuvra treated plots, thus showing that Rejuvra does not negatively impact pollinators. On the contrary, when cheatgrass is removed, plant diversity increases and so do pollinators. <https://assets.bouldercounty.gov/wp-content/uploads/2019/03/bringing-back-flowering-plants-pollinators.pdf>

## 9. Impact on Organic Farming

Staff Response: As detailed above, BCPOS’s noxious weed management on natural areas and rangeland will follow best management practices for weed management tool selection, and when herbicide use is necessary, employ herbicide selection and application protocols to minimize impacts to all neighbors, including organic farms. Generally speaking, our natural areas are in different parts of the county than organic farms. The primary exception is our noxious weed management on roadside rights of way. Our primary weed manage on roadsides is mowing, but we also apply herbicides in some areas. Organic farms are required by USDA to maintain buffer areas to assure their crops are not contaminated by non-organic practices. They should not use the roadside rights of way for buffers. This allows Boulder County to adequately manage the roadside areas for noxious weeds and prevent noxious weed infestations that may impact organic farms.

## **Conclusion**

Staff appreciates the public interest and comments provided through the IWMP survey, comments at previous POSAC meetings and field trips, and overall engagement in the public process. We have outlined above the changes we have made to our plan as a result of this input. We welcome POSAC's input during the study session and look forward to further discussion and questions from POSAC members at that time.

## **Next Steps**

- Jan. 25, 2024: POSAC public hearing to present updated staff proposal based on December 5 POSAC discussion
- Feb. 22, 2024: POSAC public hearing and recommendation
- March 12, 2024: BOCC public hearing/public comment
- April 4, 2024: BOCC decision (no additional public comment)

## **Attachments**

- A. Integrated Weed Management Plan Community Survey Results, Circuit Media
- B. List of Cheatgrass-related Articles and Research
- C. State List B Species Maps for Boulder County
- D. Proposed Herbicide Selection Protocol and Proposed List of Herbicides
- E. Revised Draft Aerial Application Policy
- F. Weed Management Treatments Cost Summary





**Draft Integrated Weed Management Plan**

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# **Community Survey Results**



**Boulder County**  
Parks & Open Space

CIRCUITMEDIA

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### Introduction and Methodology

Boulder County's Integrated Weed Management Plan objective is to restore, improve, and maintain healthy, functioning ecosystems and economically viable agricultural lands through responsible, proactive, and adaptive management of noxious weeds in accordance with state law.

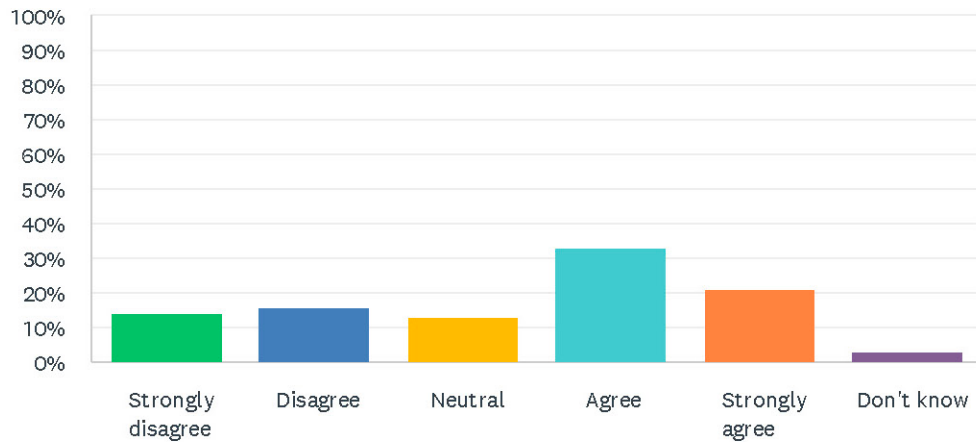
On October 2, 2023, Boulder County Parks & Open Space released its Draft Integrated Weed Management Plan (IWMP) and a companion story map illustrating planning context and weed management case studies. Along with the Draft IWMP and story map, Boulder County posted a community survey on their webpage to gather public feedback on the Draft IWMP. The survey closed on October 19, 2023. The survey received 1,076 responses, including 555 open-ended responses to Question 8.

Questions were designed to solicit thoughts on weeds as threat to ecosystem health and their contribution to wild fire risk, and opinions about alternative weed management programs, ranging from no herbicide use to herbicides as the primary tool. Respondents were asked to refer to the Draft IWMP and companion story map for more information and examples. Questions 1-7 results are from the report generated by SurveyMonkey. For question 8, "Please share any additional thoughts about weed management." Circuit Media staff manually reviewed responses to identify themes. Nine themes emerged based on key words or phrases appearing multiple times within the responses (five or more responses). Open-ended survey responses commonly include multiple themes within one response. Therefore, listed percentages do not equal 100%. The quotes enclosed within the Question 8 analysis are representative of general sentiment.

# Question 1

Total Responses: 1062  
Total Skipped: 12

**Weeds threaten ecosystem health and the variety of native plants and animals (biodiversity) on Boulder County Parks & Open Space lands.**

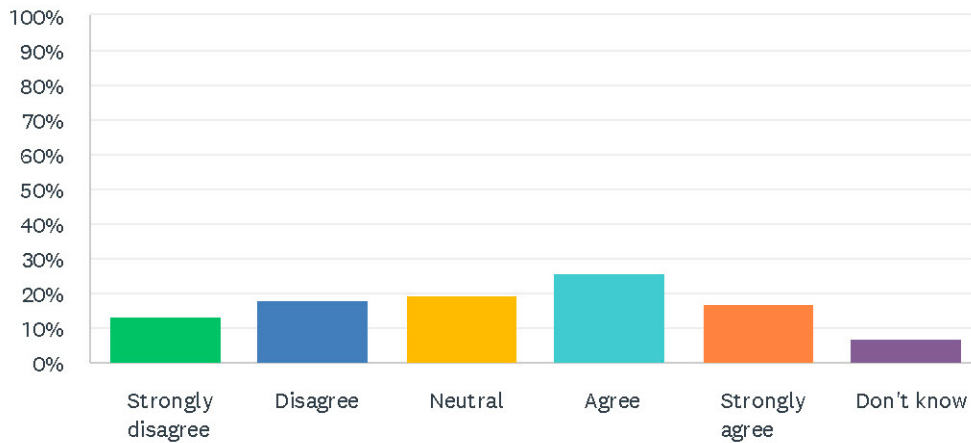


Answer Choices	Responses	
Strongly Disagree	14.03%	149
Disagree	15.63%	166
Neutral	12.90%	137
Agree	33.05%	351
Strongly Agree	21.19%	225
Don't know	3.20%	34
Total Respondents: 1062		

## Question 2

Total Responses: 1060  
Total Skipped: 14

**Weeds contribute to an increased risk of fire in Boulder County.**

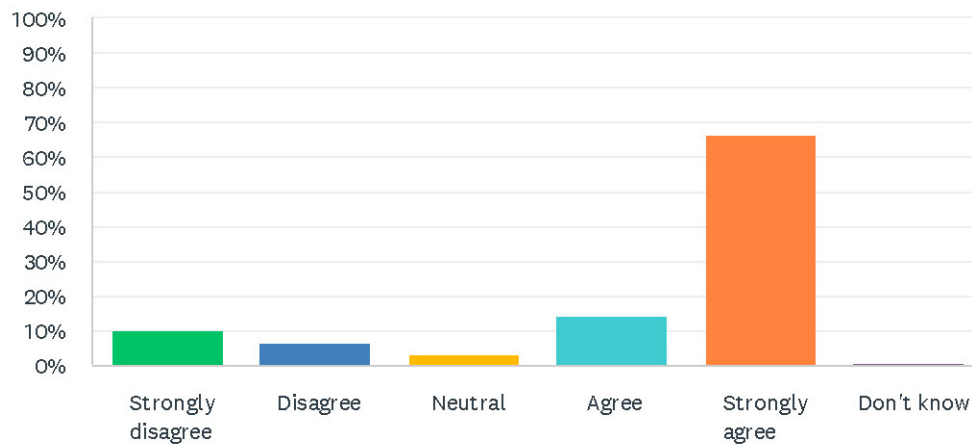


Answer Choices	Responses	
Strongly Disagree	12.92%	137
Disagree	17.64%	187
Neutral	19.53%	207
Agree	26.04%	276
Strongly Agree	17.08%	181
Don't know	6.79%	72
Total Respondents: 1060		

## Question 3

Total Responses: 996  
Total Skipped: 78

**Herbicides should not be used at all as the potential negative effects are too great. Use other treatments only (e.g., mowing, grazing, hand pulling, biological agents).**



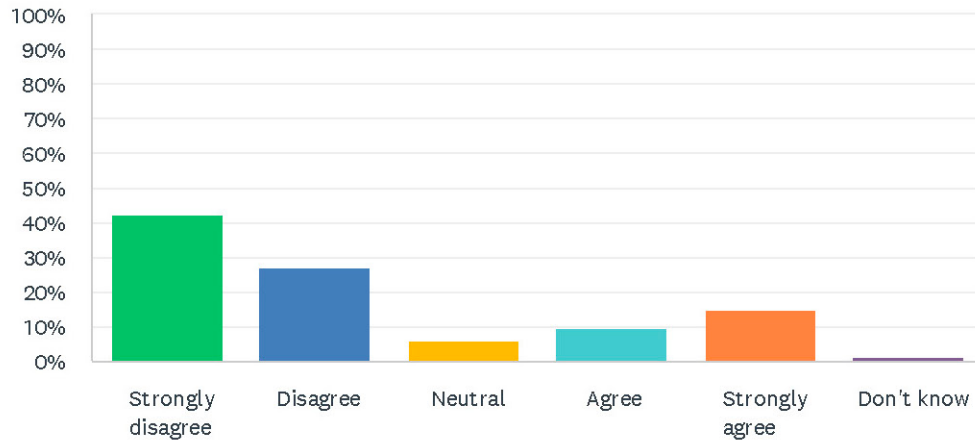
Answer Choices	Responses	
Strongly Disagree	9.84%	98
Disagree	6.33%	63
Neutral	2.91%	29
Agree	13.96%	139
Strongly Agree	66.57%	663
Don't know	0.40%	4
Total Respondents: 996		



## Question 4

Total Responses: 994  
Total Skipped: 80

**Follow an integrated approach using all available treatment tools to eradicate weeds, including herbicides, following best management practices to minimize negative effects.**

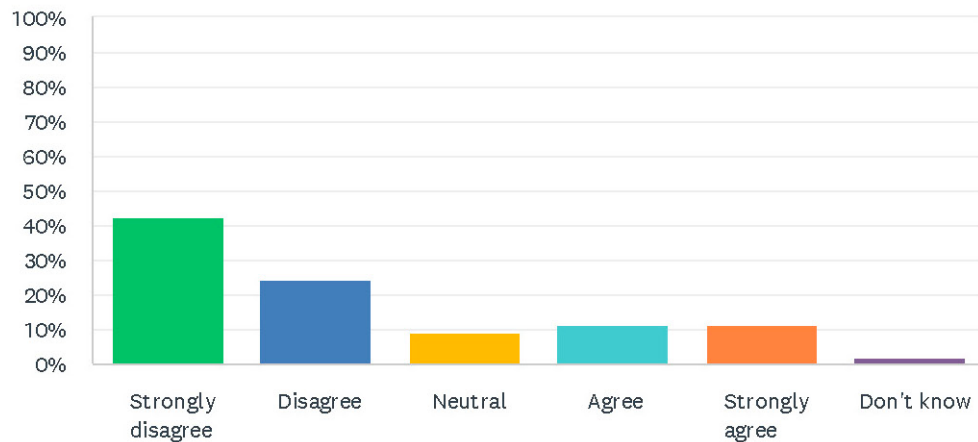


Answer Choices	Responses	
Strongly Disagree	42.05%	415
Disagree	27.06%	269
Neutral	6.04%	60
Agree	9.36%	93
Strongly Agree	14.69%	146
Don't know	0.80%	8
Total Respondents: 994		

## Question 5

Total Responses: 991  
Total Skipped: 83

**Strategic, targeted use of herbicides along with complementary treatment tools to comply with state law to eradicate List A weeds and contain and suppress List B and C weeds, as illustrated by the case studies in the Story Map.**

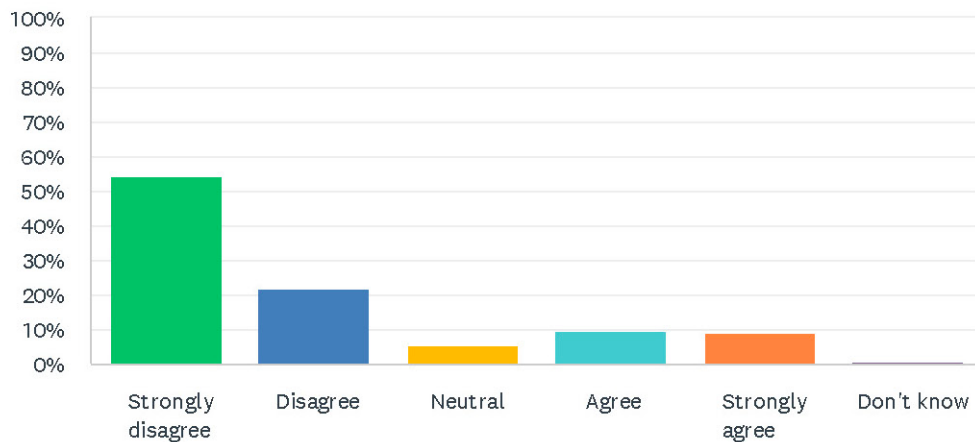


Answer Choices	Responses	
Strongly Disagree	42.28%	419
Disagree	24.22%	240
Neutral	9.08%	90
Agree	11.30%	112
Strongly Agree	11.30%	112
Don't know	1.82%	18
Total Respondents: 991		

## Question 6

Total Responses: 994  
Total Skipped: 80

**Targeted herbicide use as the primary tool for eradication of noxious weeds to maximize the ecological restoration benefits of this treatment method, acknowledging they are EPA approved and have demonstrated effectiveness with minimal negative effects.**

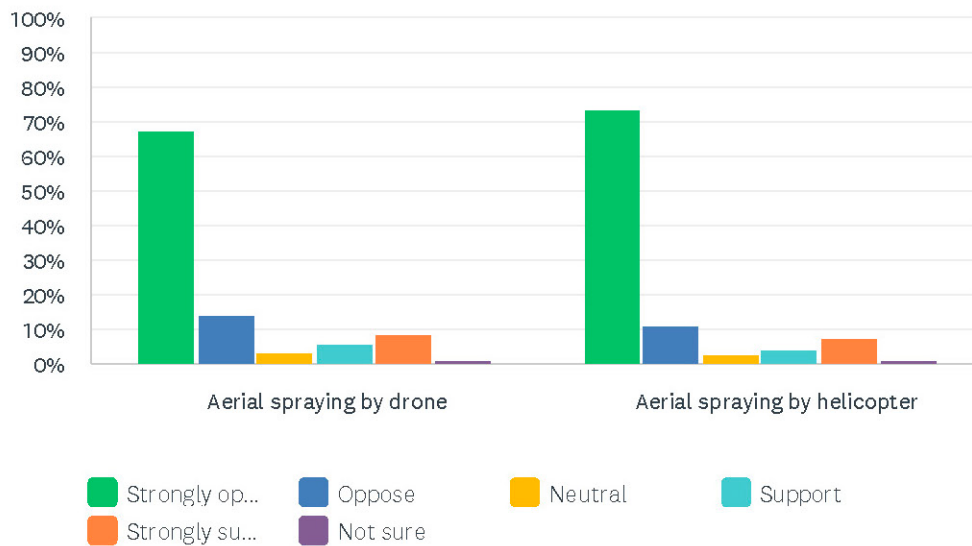


Answer Choices	Responses	
Strongly Disagree	54.43%	541
Disagree	21.33%	212
Neutral	5.13%	51
Agree	9.26%	92
Strongly Agree	9.15%	91
Don't know	0.70%	7
Total Respondents: 994		

## Question 7

Total Responses: 980  
Total Skipped: 94

Do you support the use of aerial spraying, with the conditions and buffers outlined above?



### Aerial Spraying by Drone

Answer Choices	Responses	
Strongly Oppose	67.42%	660
Oppose	14.4%	141
Neutral	3.37%	33
Support	5.82%	57
Strongly Support	8.17%	80
Don't know	0.82%	8
Total Respondents:	979	

### Aerial Spraying by Helicopter

Answer Choices	Responses	
Strongly Oppose	73.44%	719
Oppose	11.13%	109
Neutral	2.76%	27
Support	4.39%	43
Strongly Support	7.35%	72
Don't know	0.92%	9
Total Respondents:	979	

## Question 8

Total Responses: 555  
Total Skipped: 521

### Please share any additional thoughts about weed management.

The following categories are themes and summaries of responses to Question 8 of the Boulder County Parks and Open Space Draft Integrated Weed Management Plan, “Please share any additional thoughts about weed management.”

### Survey Analysis Methodology

Circuit Media staff manually reviewed responses to question 8 to identify themes. Nine themes emerged based on key words or phrases appearing multiple times within the responses (five or more responses). Open-ended survey responses commonly include multiple themes within one response. Therefore, listed percentages do not equal 100%. The quotes enclosed within the Question 8 analysis are representative of general sentiment. Analysis of responses to Question 8 were based solely on the short answer portion of the survey, and do not necessarily reflect the overall sentiments captured in the multiple choice questions of the survey.

### Theme 1: Concerns About Chemical Herbicides:

67% to 81% of responses to questions 3-6 indicated concern for herbicides depending on the management alternative. Similarly, 86% of respondents to Question 8 were against the use of glyphosate and chemical herbicides in their community. These respondents said these chemicals shouldn’t be the only solution. Concerns included the toxicity of herbicides, their impact on pollinators, and long-term environmental consequences. Glyphosate, 2,4-D, and Dicamba are specifically mentioned as chemicals of concern.

Some respondents point out that decisions about herbicide use are highly context-dependent and not one-size-fits-all. Respondents wanted the county to select herbicides with lower or no toxicity to humans and the environment.

5% of respondents expressed low trust in regulatory agencies like the U.S. Environmental Protection Agency to evaluate the safety of chemicals. Respondents said following EPA standards may not be sufficient to protect the ecosystem and human health.

#### Representative Comments:

“I am strongly requesting a moratorium on pesticide use for noxious weeds that are currently on both List B and List C , as well as weeds that are not on Lists A, B, or C.”



### Theme 2: Support for Herbicide Use:

Responses to Questions 3-6 showed support for herbicide use ranging from 18-24% depending on the scenario. For Question 8, 8% of respondents expressed support for the controlled use of herbicides as part of integrated weed management plans. They argued that herbicides can be effective tools when used responsibly and said “chemo-phobia” can be an influencing factor to a strongly negative public response. These respondents said fire mitigation efforts are a more significant issue to them than pesticide use.

A few respondents highlighted the need for proactive invasive weed management to protect native wildlife and vegetation. Some respondents suggest that herbicides should only be used for specific, highly invasive weed species (List A) rather than a blanket approach.

#### Representative Comments:

“Herbicide, when applied correctly, is a safe, efficient and effective tool that must be used as part of an integrated weed management plan to meet state mandate and protect biodiversity in Boulder County. The resource specialists that treat noxious weeds at Boulder County Parks & Open Space are top professionals in their field and should be recognized as technical experts in integrated weed management and herbicide application. Since this process to draft and adopt a new weed management plan in Boulder County began, I’ve been witness to the spreading of false information in regards to herbicide toxicity that is not based on peer reviewed scientific studies. Furthermore, without all the tools to manage noxious weeds, these invasive species will spread into neighboring communities, negatively impact critical habitat and become a greater financial burden for tax payers of Boulder County to shoulder.”

“With several decades of experience as a weed manager and herbicide researcher, I feel that well-selected and well-applied herbicide treatments are an important and economical mechanism for management of noxious weeds. In many cases, directed applications of selective herbicides are not only highly effective and economical but may also be less environmentally damaging than intensive grazing or physical controls such as dozers, cultivation or even hand pulling because of the soil disturbance. Weed management practices (or lack of weed management) all have impacts on the environment whether chemical, physical, or cultural in nature. Weed management plans developed by knowledgeable weed managers can evaluate the tradeoffs within the context of site-specific conditions and maximize weed control while minimizing negative impacts. Herbicides are a group of tools that should be in the toolbox of Boulder County weed managers.”

### Theme 3: Concerns About Aerial Spraying:

Responses to Question 7 show 84% of respondents strongly opposed (73%) or opposed (11%) aerial spraying by helicopter; opposition to the use of drones was slightly less (81%). In Question 8, 31% of respondents are opposed to aerial spraying of herbicides. Concerns include herbicide drift, unintended exposure, and toxins reaching non-target areas, including water ditches and groundwater, even with the inclusion of buffer zones. Overall, the sentiment is that aerial spraying should be minimized or eliminated due to the perceived risks and the potential for unintended consequences.

#### Representative Comments:

“I do not support aerial spraying in the vast majority of circumstances. 50’ is not nearly enough from our waterways and ecologically sensitive areas. Winds, rain, and other natural factors can cover this distance in a few hours or days.”

“The 1/8th mile notification is absolutely not adequate. Chemical companies are notorious for minimizing the negative impacts of herbicide drift and toxicity to both wildlife and humans. (Thus the thousands of lawsuits against Monsanto related to Glyphosate and cases of Hodgkin’s Lymphoma, as well as the collateral damage to pollinators and aquatic life.)”

“I may support the use of herbicides to control only List A weeds, but no others. I do not support helicopter spraying. Drone spraying guidelines must include cancelation due to weather and wind day of, which would confound accurate delivery to target areas. The health of downstream lands and waterways must not be compromised, necessitating short and long-term monitoring systems to insure there is no spill over outside of the targeted areas. Herbicide records should be kept indefinitely, and available to the public and researchers, to provide important information for long-term analysis. “

### Theme 4: Environmental Concerns:

34% of respondents identified a concern with the environmental impact of using herbicides. Respondents argued that the negative impact on non-target species like native plants and insects outweighs the benefits of herbicides. 7% of respondents identified the survival of pollinators as a key concern.

23% of respondents didn't want herbicide use near waterways, or were concerned about water contamination. They called for greater distance between spraying and water sources to prevent contamination of surface water and groundwater.

12% of respondents also said chemical herbicides can degrade soil fertility and microbiomes. Respondents suggested alternate practices that protect soil health, like regenerative land management, targeted grazing, controlled burns, and community soil health initiatives.

The responses emphasized the importance of biodiversity and ecological restoration in weed management, suggesting the county also targets the root causes of the spread of invasive species. Respondents called for a comprehensive understanding of the potential consequences of herbicide use on various organisms and habitats.

#### Representative Comments:

"A pilot program using regenerative practices for targeted grazing of weeds and using weed management money is needed. It's time for the County to be paying regenerative land managers to manage weeds through targeted, strategically timed grazing. Monitoring of spray sites and downstream water bodies for non-target impacts (insects, aquatic organisms, water, soil, and drift) is absolutely essential and required. The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms."

"BCPOS should identify and address the root cause of noxious weeds, and then diligently implement the BCPOS decision model for early detection and rapid response. BCPOS should conduct monitoring of spray sites and downstream water bodies, including ditches and groundwater, to determine short and long term environmental impacts on water quality, soil health and non-target organisms, including insects and aquatic organisms. BCPOS should establish a robust monitoring database for use in future environmental toxicity studies. BCPOS should ensure that the weed management plan aligns with all BCPOS public health and environmental protection objectives, and related management plans, including soil health initiatives."

"There is no discussion about the likely effects of herbicides on ecosystem functions or on non-target organisms such as: pollinators; sensitive native plants; soil microbial communities; soil invertebrates; nearby aquatic organisms; or birds that may feed, loaf, or nest in treated areas."

## Theme 5: Alternative Methods of Weed Control:

16% of respondents mentioned prioritizing alternative methods of weed management over herbicides. They suggest that these approaches could be more effective and environmentally friendly than chemical herbicides. Some solutions include using goats or other livestock for grazing (4% of responses), involving local volunteers in manual weed removal (2% of responses), paying laborers to remove weeds, vinegar, mechanical weed removal, using indigenous knowledge, planting native species in order to outcompete invasives, and controlled burns.

### Representative Comments:

“The county should also consider the use of grazing as the City of Louisville has been doing with good success at controlling unwanted plants and for controlling for wildfire risk. Human and animal labor, use of fire, tilling, and other time-tested methods are preferred over the use of toxic herbicides.”

“Involving citizen volunteers to help hand-pull weeds on open spaces, and share stewardship responsibility would make sense.”

“The best weed management is the cultivation of robust native plants. Herbicides poison our waterways and harm native plants that our struggling pollinators depend on. Research-based permaculture practice indicates the application of herbicides ONLY using the “paint-on” method (applying liberally to stumps of trees/woody perennials), as this is the only method demonstrated not to affect native plants and wildlife via overspray. Herbicide application should only be done by hand, as the last-step tool for eradicating aggressive woody-stemmed trees, shrubs, and vines.”

### Theme 6: Health and Safety:

16% of respondents emphasize that public health and the well-being of communities should be a top priority when making decisions about weed management. Many respondents were concerned about the potential health risks to humans, especially children and domestic animals. Some potential health impacts listed were cancer, endocrine disorders, and neurological diseases. A few respondents shared personal experiences of negative impacts from prior aerial spraying, including health issues for themselves or their pets. Some respondents cite research linking herbicides to health issues and suggest that Boulder County should be cautious with pesticide use.

Respondents also expressed concern for those who may be more seriously impacted by herbicides, particularly individuals with respiratory issues or other sensitive populations. Additionally, respondents were concerned about the health and safety of marginalized communities in Boulder County.

#### Representative Comments:

“For the long safety of our community, Herbicides must be used in very targeted situations when there is NO other option. Their negative impact far exceeds their benefit and we do NOT understand how they impact the long term health of our community.”

“Rigorous monitoring protocols should also be implemented to assess the impact on water quality and non-target ecosystems, thereby safeguarding both environmental and economic assets. Furthermore, it’s imperative to consider the social equity dimensions of this issue. Marginalized communities are disproportionately affected by environmental degradation, which in turn has economic repercussions. These communities often have less access to healthcare and are more dependent on local ecosystems, making them particularly vulnerable to the adverse effects of herbicides.”

“As a mother of two small children, I vehemently oppose use of these toxic, cancer causing chemicals. The harms to our community and ecosystem are too great. Glyphosate for example has a proven track record of being toxic to the nervous system i.e., neuro inflammation, mitochondrial dysfunction, oxidative stress etc. It is also well known to cause cancer as well as disrupting the endocrine system.”



### Theme 7: Community Involvement and Outside Expertise:

9% of survey respondents suggest involving the community in weed management. Some respondents offered volunteer labor and expertise, or suggested initiatives like community-wide weed clean-up days, educational programs, and involving local schools and volunteers in weed management.

Several respondents within this category said they were dissatisfied with the lack of transparency and community engagement in both the current and prior iterations of the weed management plan. They said the community, including scientists, local educational institutions, farmers, and environmental groups, should have a more significant role in decision-making and the development of a comprehensive weed management plan.

Respondents stressed the importance of collaborating with ecologists, soil scientists, and biologists for comprehensive assessments. Respondents also suggested involving farmers in creating and managing grazing practices.

Many respondents called for a collaborative and interdisciplinary approach to future weed management. They stressed the importance of independent, non-company-funded research to guide policy decisions, and argued that land-use patterns and climate change contribute to weed issues.

Some respondents recognized the expertise of Boulder County field staff and their ability to make informed decisions regarding weed management. They emphasized that these experts should be trusted to choose the appropriate tools for the job.

A few respondents criticized the survey's structure, suggesting that it appeared biased in favor of herbicides.

#### Representative Comments:

"County weed managers should be collaborating with ecologists, soil scientists, biologists and others who have the credentials to assess the impacts these chemicals are having within our public lands."

"There needs to be more work by the County to utilize weed control methods that minimize the impact on native species, soil organisms, and aquatic environments. The County should be a leader in weed control practices, using local data to make science-based decisions. The proposed weed management plan is lacking in data specific to our area and represents a "status quo" approach to complying with state requirements for weed control. Frankly, I am disappointed at the lack of science-based reasoning and innovative solutions in the management plan."

### Theme 8: Request for More Research:

6% of respondents said they wanted to see more research on the environmental and health effects of herbicides for both short- and long-term impacts. Respondents called for rigorous monitoring protocols to assess the impact of weed management efforts on physical health, water quality, soil health, and non-target ecosystems.

Some respondents called for greater transparency from the county regarding pesticide use, including publishing records of pesticide applications. They also emphasized the need for water testing at spray sites and for downstream residents, and for this data to be made publicly available for long-term analysis.

Some survey respondents requested a pause in the use of herbicides until a comprehensive and inclusive assessment of herbicide effects on the ecosystem is developed.

#### Representative Comments:

“We need a moratorium on herbicide & pesticide use until a more inclusive public process is developed and implemented.”

“As one who grows native pollinator plants on my property, and my ranching activities require my livestock (honey bees) to graze on Open Space lands, it is imperative that we place a moratorium on the spraying of pesticides (not a requirement by the State of Colorado to manage weeds) until a more science based, data driven, and community formulated approach is developed. There is so much more that needs to be done in this area, including a more rigorous process for approving pesticide types, like the one that the City of Boulder employs, and assessments of the effects of the current spray program has on our soil, water ways (a Boulder County natural creek passes through my property), plants, and native and agricultural pollinators.”

“In addition to a much more stringent process for approval of pesticide usage on public lands, the County must implement a monitoring program for spray sites and downstream water bodies. The monitoring program must examine potential impacts on water, soil, aquatic organisms, insects, and crops affected by spray drift. Boulder County needs to keep usage and monitoring records long-term to aid in future toxicity studies.”

## Theme 9: Impact on Organic Farming:

2% of survey respondents raised concerns about the effects of herbicide drift on organic farms, as herbicide contamination can potentially jeopardize organic certification and waterways used in agriculture. Respondents said organic and sustainable agricultural practices are essential for the county and climate.

### Representative Comments:

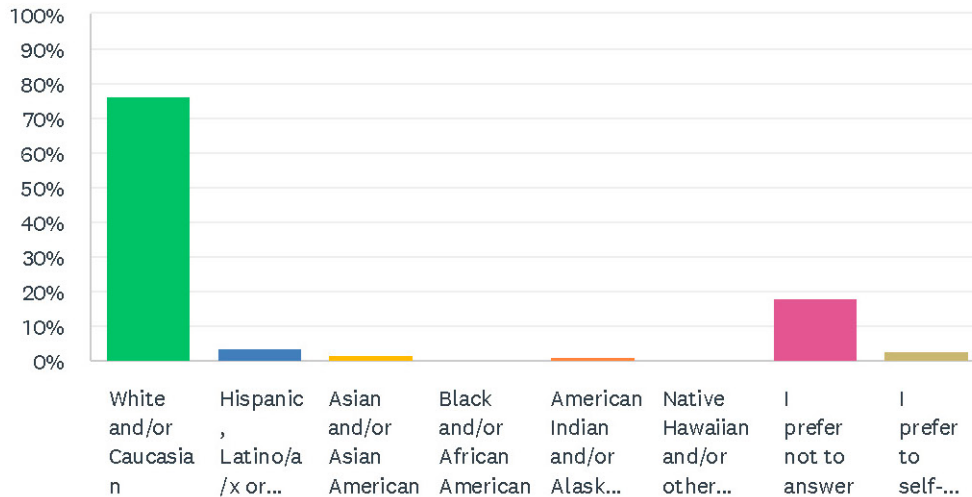
“Many of the farms in Boulder county that supply food to our community are organic farms. I am an organic flower farmer in East Boulder. I sell flowers to the public as well as an all local organic wholesaler. It is essential to the health of the soil that herbicides not be used. It is essential to my health, as someone who works intimately with the earth, to never use pesticides. I work tirelessly to manage weeds with organic methods that are effective. Water will carry Glyphosate and other herbicides throughout the land. It will ruin farms, farmers, and the community at large.”

“Organic farms and fruit orchards nearby will suffer from drift no matter how they are applied. “

## Question 9

Total Responses: 938  
Total Skipped: 136

Which of the following best describes your race or ethnicity?

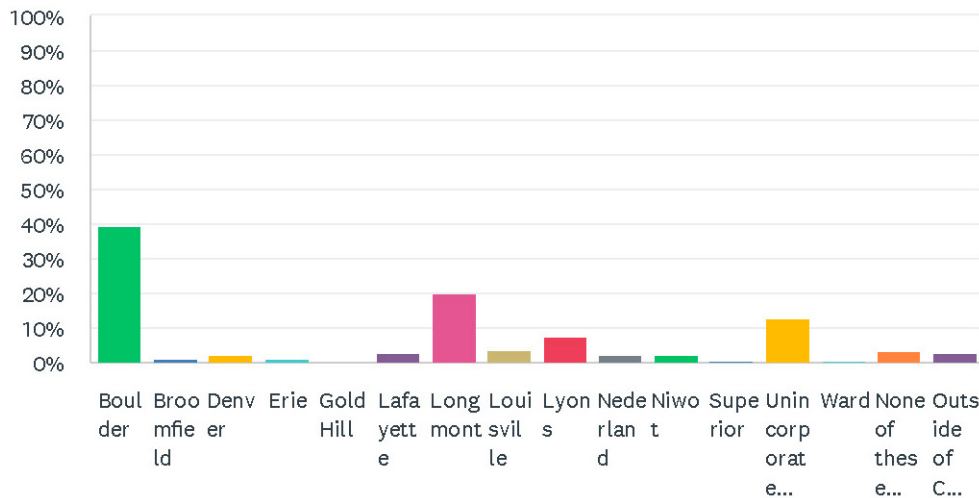


Answer Choices	Responses	
White and/or Caucasian	76.33%	716
Hispanic, Latino/a/x or Spanish	3.52%	33
Asian and/or Asian American	1.60%	15
Black and/or African American	0.11%	1
American Indian and/or Alaska Native	0.96%	9
Native Hawaiian and/or other Pacific Islander	0.21%	2
I prefer not to answer	17.80%	167
I prefer to self-describe (please specify)	2.56%	24
<b>Total Respondents: 967</b>		

# Question 10

Total Responses: 961  
Total Skipped: 113

## Where do you live?



Answer Choices	Responses	
Boulder	39.23%	377
Broomfield	1.14%	11
Denver	1.87%	18
Erie	0.83%	8
Gold Hill	0.21%	2
Lafayette	2.39%	23
Longmont	19.98%	192
Louisville	3.43%	33
Lyons	7.60%	73
Nederland	1.98%	19
Niwot	1.98%	19
Superior	0.62%	6
Unincorporated Boulder County	12.70%	122
Ward	0.31%	3
None of these but in Colorado	3.12%	30
Outside of Colorado	2.60%	25
Total Respondents: 961		





**Draft Integrated Weed Management Plan**

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# **Community Survey Results**

**Appendix I: Question 8 Responses**



**CIRCUITMEDIA**

**Boulder County**  
Parks & Open Space

[BoulderCountyOpenSpace.org](https://BoulderCountyOpenSpace.org)

[POSinfo@bouldercounty.org](mailto:POSinfo@bouldercounty.org)

303-678-6200

## Complete Responses to Question 8

1. We have lost way too many pollinators and monarchs etc. It is past time to err on the side of caution.
2. You can use goats for steep areas
3. Do not use chemicals on our precious land. We lost our home to the Marshall fire but weeds can be controlled through other ways that don't affect us, our animals and the ecosystem
4. There are many examples of current ecosystem management protocols that are rooted in biological practices. A novel herbicide with an EPA warning about the impact on surface and ground water should not be Boulder County's first instinct. This seems uncharacteristic for a liberal town full of brains that could likely solve this cheatgrass problem without tainting water sources. Tap into your community before you introduce a poison into the ecosystem. I have 350 high school students willing to work for free to combat a weed manually before we spray a chemical all over the ecosystem. This is an antiquated way of control that is shifting out of practice around the world. Boulder is better than this.
5. It is needed to avoid as possible the use of chemicals that hurt the land and the environment (health, community, land, plants, animals, etc. ) Sustainable and restorative practices.
6. Boulder is consistently heralded as an example of foreword thinking, weed management is an extremely relevant topic and offers an opportunity for Boulder to lead by example and redefine best management practices.
7. The use of arial spraying of toxic chemicals on public lands is horrible! We should be using non toxic means like mechanical removal, prescribed burns and grazing. Indigenous knowledge and best practices that do not introduce toxins that bioaccumulate in our ecological systems is what we should be employing to help heal the land. Best practices should be based on real science not science backed by big chemical industries. Have you read silent spring? I cannot believe we live in well educated boulder county and our land agency responsible for caring for our public lands is pouring toxins out of helicopters and not communicating with communities directly effected. You're using chemicals banned in other countries and i in no way support the current way you are managing our resources. Please stop using toxins and exposing your public. Cancer, endocrine disorders, neurological disease are caused by these toxins. Please stop!
8. Management needs to understand that integrated management is a process that involves multifaceted ecological management strategies not a catch phrase. A questionnaire that bifurcate just spray and no spray management is proving a lack of understanding of what is and how to implement integrated pest management.
9. no more herbicides or pesticides we are ruining everything

## Boulder County Parks & Open Space

10. Please don't use chemicals as they are not the answer. They hurt the local wildlife, our family pets and contaminate our water.
11. At best, you can only reduce weeds temporarily because you can't treat private land and land managed by other government agencies where weeds exist and can spread from. The risk to public health and well being posed by weeds is far less than the risk posed by contaminating water and food sources with arial herbicide spraying.
12. Pesticides are more harmful than acknowledged. The reasons include poor application practices, the inevitable cross contamination of soil and water, destruction of the seedbank, and so much more. It is my understanding that Boulder County is still using pesticides for which the manufacturer's are paying out large sums after losing lawsuits. Why is the County taking on this legal risk? If the effects of human-caused changes to the landscape cannot be reduced or reversed without the use of pesticides, my belief is that we should accept that we are in the age of the Anthropocene and change our relationship to the earth. Given the opportunity, the earth will heal itself. But not if we keep poisoning it.
13. I strongly oppose any use of herbicides. They are proven through research to cause extreme negative impact on health of humans and animals, especially children.
14. I am a farmer in boulder county and while i appreciate the difficulty of the task that municipal staff are presented with in managing weeds, i also understand that the herbicides being used and considered are persistent, mobile, and water soluble. I strongly advise that herbicides are not applied on plants or soils, and that all other solutions are implemented instead.
15. Please do not use these synthetic poisons which contaminate our soil and water. Thank you.
16. the EPA cannot be trusted to decide what chemicals are "safe"
17. The draft plan does not include any mention of how to measure, control, or mitigate the effects of herbicides on the ecosystem-- birds, soil, watershed, amphibians, aquatic life, microorganism, beneficial insects and pollinators. There is not even an acknowledgment that such herbicides might affect organisms other than plants. There should be clear and concrete guidelines for assessment and monitoring of such effects. Not to mention organic agricultural crops and livestock. Further, the questions are biased as written -- there is a middle ground between "never use herbicides under any circumstances" and "use them in any way we see fit with no safeguards or controls, just trust us" but that position is not presented in the survey. Herbicide "product safety guidelines" are industry-wide and woefully inadequate, especially to protect an ecosystem that is as delicate and unique as the Front Range Open Space lands. You need ecologists on your team, not just weed control specialists. I agree with the open letters of Mark Guttridge (Olin Farms) and Dr. Tim Seastedt, which are far more comprehensive and knowledgeable than the County draft plan. We can do



better!

18. I would very much like to see stronger methods being used to control weeds in Open Space property. Weed seeds spreading is a big problem and hurts the native environment on many levels
19. NO HERBICIDES whatsoever.
20. I wish we understood better the downstream externalities of using these herbicide at a large scale...
21. What about using goats in rough terrain?
22. This shit causes cancer!! Stop using it!!
23. Aerial spraying to eliminate cheatgrass is a counter-productive measure. Cheatgrass does not have the same effect on biodiversity or fire risk in Boulder County as it does in California studies. The tradeoffs to spraying our open space are overwhelmingly negative, and invasive species can be better managed through non-toxic measures without poisoning native plants on open space. <https://coloradosun.com/2022/11/20/yet-boulder-county-continues-to-spray-harmful-chemicals-to-kill-a-grass-that-isnt-responsible-for-fire/>
24. I wonder what the Land and the weeds would say if we ask people who KNOW how to LISTEN to the Land and talk with the plants-- ask Indigenous People who do so, and others!
25. Really?!?! Herbicides are not cool. As a beekeeper and a human, they scare me.
26. This is not a responsible plan for mitigating weeds when we have so many small farmers working to rebuild our county's soil.
27. There is no way to make sure that the herbicide is only landing in the targeted are. It will end up killing vulnerable species in closing bees, birds, snakes frogs and lizards. There is also no way to spray the west fence line with out it drifting on the the residential properties to the west. Spraying with herbicide is not a good option. If the city would maintain the ditches properly and clean them every year, I have a feeling we would not have nearly so many weeds. My grandfather was the ditch boss for several of the local ditches for many years, and that was how he maintained the overgrowth of all of these weeds. But I honestly cannot say that it is done on any sort of regular basis, since he retired.
28. Please, do not flood our air and water with these toxins.
29. Use cattle when possible. Spraying trees/weeds in Open Space exposes us all to potentially harmful substances
30. Seek out indigenous or regenerate agriculture processes to manage "weeds".

## Boulder County Parks & Open Space

31. We know the risks of glyphosate. Why are you trying to harm the people of so called Boulder County?
32. There are so many other better alternatives that will not contaminate our waterways, soils, and overall human health.
33. We just have to find a better way other than spraying Poisen. It is possible
34. Difficult questions to answer because some species respond to manual or biological treatment. Spot treatment might make sense depending upon species and herbicide proposed.
35. herbicides and pesticides should not be used on our lands. They will enter waterways, they will damage ecosystems, they will negatively affect soil quality, insect life and animal life, plant life. They may fix one problem while creating other problems.
36. The chemicals used to poison animals and people alike, besides affecting the soil itself negatively.
37. I recommend bringing the local Herbalists to the table fo this discussion and hear what they have to say. Also, here in Boulder County there is a non profit organization called Community Fruit Rescue that provides a insured group of volunteers to pick fruits in peoples yards ect. to ensure that the wild life ( bears ect. ) are not destroyed for coming into neighborhoods and to use the bounty of the fruit for local organizations that provide nourishment for both Humans and for Animal Sanctuaries....How about we do something like this in Boulder County with these plants while informing the Communities of their nutritional and creative values and uses???
38. Weeds have existed for a really long time and humans and have had to live with them and found non-chemical ways of dealing with them in all of that time. We are swimming in chemicals and it is messing with animals and humans in very dangerous ways. Especially in natural areas, it seems like it is better to handle things in natural ways.
39. The listing of herbicides as least concern to impacts to human and animal and insect health is outdated and subjected strongly to regulatory capture by funding of targeted research to “Prove the Safety” of various herbicides by the same companies that manufacture and sell them. I provide just two recent vetted research articles that describe harms to man for various herbicides on Boulder Counties approved list of herbicide. Glyphosate and 2,4 D harms are described in man. Now we’re realizing that glyphosate may also be quite persistent in hard water areas,” said Ferguson. “This gives me concerns about exposures here in the United States.” OCTOBER 11, 2023 Roundup herbicide ingredient connected to epidemic levels of chronic kidney disease. URL: [https://phys.org/news/2023-10-roundup-herbicide-ingredient-epidemic-chronic.html?utm\\_source=nwletter&utm\\_medium=email&utm\\_campaign=weekly-nwletter](https://phys.org/news/2023-10-roundup-herbicide-ingredient-epidemic-chronic.html?utm_source=nwletter&utm_medium=email&utm_campaign=weekly-nwletter) The results of the study were published in Environmental Science and Technology Letters on September 13, 2023. More information: Jake C. Ulrich et al, Glyphosate and Fluoride in High-Hardness Drinking Water Are Positively

Associated with Chronic Kidney Disease of Unknown Etiology (CKDu) in Sri Lanka, Environmental Science & Technology Letters (2023). DOI: 10.1021/acs.estlett.3c00504 Journal information: Environmental Science & Technology Letters “Research suggests commonly-used herbicide is harmful to adolescent brain function” In the Oct. 11, 2023 online issue of Environmental Health Perspectives, the researchers reported measuring metabolite concentrations of two commonly used herbicides—glyphosate and 2,4-dichlorophenoxyacetic acid (2,4D)—and the insect repellent DEET in urine samples collected in 2016 from 519 adolescents, aged 11 to 17. More information: Briana Chronister et al, Urinary glyphosate, 2,4-D and DEET biomarkers in relation to neurobehavioral performance in Ecuadorian adolescents in the ESPINA cohort, Environmental Health Perspectives (2023). DOI: 10.1289/EHP11383

40. No thank you. We do not need or want any chemicals sprayed into our atmosphere. For the sake of us our children, our farm land and our animals. Please reconsider leaving nature be.
41. Noxious and certain other non-native weeds (see CDA watchlist) are a serious threat to ecosystem health, and herbicides are an important tool that must be utilized where other IPM treatments are ineffective.
42. Please reach out to biology professors and professionals. I do not want herbicides being used in my county.
43. crazy to poison our land and water to get rid of “weeds” by using dangerous cancer causing “herbicides” what else will it rid of .... People, animals, insects bees? Insanity for sure
44. Pesticides and the use of aerial spraying are crimes against humanity and this planet, and further, these methods of “weed management” are encouraged and supported by those who seek profit and do not consider the health and safety of humanity and this planet. I STRONGLY OPPOSE ALL PESTICIDES AND AERIAL SPRAYING!!! “The only difference between a weed and a flower is an opinion.” A weed is but an unloved flower. Thank you.
45. Dear Boulder County, I thought public service agencies were entrusted with the privilege of protecting the people, land and other species in the areas (in this case, counties) they serve. I am disheartened that you have chosen to take the easy (read lazy and reckless) way out by applying herbicides in any fashion and, often, without notice. This is BOULDER County for Pete’s sake! I implore you to do the job you were entrusted with and put public health and safety above all else (including special interest groups, politics, monetary gain, etc.). HERBICIDES ARE CARCINOGENIC. Why must we say more? Please reverse your policy and ban the use of herbicides county wide. Many lives depend upon it. Sincerely, Laura Kohlhaas
46. I strongly oppose the use of pesticides and herbicides for weed management in Boulder county, particularly 2,4-D, Dicamba, Glyphosate, and Indaziflam, and particularly through aerial spray applications. These chemicals are short-term band-aids that are ultimately contradictory to the goal of maintaining and

enhancing native biodiversity, thus necessitating increased herbicide and pesticide use in the future and causing ripple consequences for land use, soil health, and the health of other species, including humans. Instead, I strongly support the use of other weed management techniques in conversation with local regenerative land managers, such as targeted grazing, identification and consideration of the root causes for noxious weeds in Boulder's land stewardship plan.

47. NO Aerial spraying of anything at any time is acceptable
48. Aerial spraying cannot be adequately contained. Herbicide drift occurs for up to 2 miles. Ask farmers whose crops have been destroyed by their neighbors use of Dicamba or 2-4-D. I have personally had garden plants impacted by pesticide drift. The 1/8th mile notification is absolutely not adequate. Chemical companies are notorious for minimizing the negative impacts of herbicide drift and toxicity to both wildlife and humans. (Thus the thousands of lawsuits against Monsanto related to Glyphosate and cases of Hodgkin's Lymphoma, as well as the collateral damage to pollinators and aquatic life.) I understand that limited spot applications of herbicide may be the only option in some cases. However, I am concerned about the exposure of the staff applying these chemicals, their care and expertise, and the public's exposure during (in the case of aerial spraying) and post-application.
49. Please consider that "management" of wild areas- and especially with herbicides, is a very slippery slope. Ones that are ok'ed by the EPA, mean little, as the US is way behind other countries in banning toxic chemicals KNOWN to be injurious to life, including humans. As a home owner, gardener and beekeeper (of over 15 years) in Boulder- I have personally been aware of the continued decline of many insects, not just bees- and I am very concerned. For them, for the soil, for the water, for amphibians, and literally all the life- and connections we are aware of- and the ones we aren't! I am opposed to pesticide use on public lands. I ask for a moratorium on all pesticide use until there is a more clear plan. Even our local authorities on the subject say the approach you are considering is "not driven by best science." Let's please pause and consider other more viable, less dangerous options like regenerative weeding with grazing, etc. Life depends on it. Thank You.
50. I don't know enough about the effects of herbicides, but I do know that the weeds pose a extremely high risk of fire danger in Boulder County
51. Please just pull or just use stuff that's natural not spraying overhead
52. The Boulder County Audubon Society agrees with the goal of eventual reduction and elimination of pesticides, when management goals can be accomplished. We encourage regular review of independent and peer-reviewed literature that may show that certain pesticides could cause harmful effects, in which case that pesticide use should be decreased or ceased, including pesticides that The National Audubon has filed against at the EPA. We encourage increasing post-application monitoring of habitats and streams

## Boulder County Parks & Open Space

to assess if chemicals are entering or lingering in these places. We strongly support the protection of wild bighorn sheep herds from domestic goats. We would like to learn more about how Boulder County plans to mitigate impacts of moving livestock serving as noxious weed vectors between sites. Small unmanned aerial systems and drones could provide major benefits in scouting for noxious weed infestations and incipient populations of weeds, including incorporating Artificial Intelligence and Machine Learning to identify and predict locations of weeds. Finally, the cultural methods for prevention including use of boot-brush stations and educating trail users through signage and information through mobile apps should be increased and enhanced, with specific goals for number of boot brush stations and monitoring usage as feasible. The prevention protocols for contractors to sanitize vehicles and equipment between sites should be embedded in contracts and enforced through spot-checks, monitoring and/or reporting as feasible. Thank you for the opportunity to provide comments on this important Draft Integrated Weed Management Plan. Alison Cohan, On behalf of the Boulder County Audubon Society accohan@gmail.com

53. Seems like Boulder is highly conscious of the downsides and dangers of human-created herbicides. I do trust the open space agencies in that regard. You have bad attitude toward recreation, but that is a different matter.
54. the weed situation is out of control !
55. Boulder County should be a leader and innovator in weed management techniques that do not involve herbicides except in extenuating circumstances. We should be leveraging prescribed grazing, compost tea applications, and mechanical techniques to manage with invasive weeds.
56. spraying chemicals from the air and getting chemicals in our water is NOT the solution!! There are plenty of cost-effective, natural alternatives!! STOP poisoning the people and the land for the sake of convenience!! Hire some people to pull weeds, plant native plants that naturally fight off non native plants, use natural solutions NOT HARSH CHEMICALS to kill not native weeds. There are PLENTY of other options.
57. Spraying should be avoided at all costs. Boulder County is an area with higher than average resources, and our communities value access to the outdoors and ecosystem health. We should be leaders in using other non-spraying methods for managing weeds.
58. Big no to any use of fertilizers or herbicide
59. Please do not use any herbicides on our public lands. They are harmful
60. The chemicals used while may be approved are known carcinogens and banned outside of the US. Thus, the benefit of weed management through the use of herbicides is not worth the detriment it causes to our health. It is our duty to protect the health of one another. This may mean at times making the decision to use natural methods to manage weeds.

## Boulder County Parks & Open Space

61. There should be no more harmful and toxic chemicals used on our open space!
62. No herbicides
63. Keep our families safe. Do not spray.
64. I assumed Boulder County would be in the lead in stewardship of our collective resources but the draft 'weed management' plan shows that is far from the case. The plan is contrary to ERA goals 1, 2 and 4; it claims to rely on "best practices and scientific evidence" but includes no citations or descriptive content; there is no justification included for the use of herbicides nor their negative consequences or costs. Although this survey uses the term "biodiversity" the plan is replete from any framing or acknowledgement that weed management is ecosystem restoration and rehabilitation. I am totally opposed to any use of chemical herbicides in publicly held Boulder County property (just as I was shocked and dismayed that I had to opt out of BOCO funded mosquito control of my property). Finally it is very very sad that only one of the very many people noted at the beginning of the report appear to have any 'plant' expertise and no one consulted appears to have any environmental or ecosystem expertise despite the extensive available human resources in our community--there is not even any evidence that CSU extension has been consulted?!? And why would costs be excluded from this report--it makes me suspect someone want to let out contracts for spraying, which is a use of my tax dollars that I am totally opposed to.
65. Using herbicides in our public lands is hazardous to the health of humans, wildlife, and our ecosystems. I especially oppose the broad application of poison on public land. There are other more effective ways to control weeds and manage our ecosystems. Improving soil health should be the top priority.
66. I do not support aerial spraying. The risk to our waterways and ecologically sensitive areas is far to great, especially with only 50' buffer. Winds, rain, and other natural factors can cover this distance in a few hours or days.
67. I do not support aerial spraying in the vast majority of circumstances. 50' is not nearly enough from our waterways and ecologically sensitive areas. Winds, rain, and other natural factors can cover this distance in a few hours or days.
68. Aerial spraying (drone and certainly aircraft) is too indiscriminate. Also, too much evidence and just too much we still don't know (including the EPA!) about adverse long-term effects of these herbicides.
69. While effective weed management is important for many reasons, spraying detrimental herbicides will create more problems in the long term. Aside from the impact on local wildlife, chemical herbicides become less effective over time creating a need to use a larger quantity and establishing "super weeds" that are resistant. Chemical herbicides degrade the fertility of soil, pollute ground water and are not an effective

long-term solution for eradicating weeds.

70. I am strongly opposed to using herbicide on public lands without a comprehensive environmental impact study. Following the manufacturers recommendations for the safe use of herbicides is not sufficient. The toxicity in our environment is already very high, and to increase the toxic load to any part of the ecosystem is to increase all of our chances of getting cancer. It's time to consider a completely different paradigm, which is working with nature not trying to control and dominate nature. Please consider this critical change in paradigm. Thank you very much, Stephen Bross
71. Children in our area cannot run barefoot in the grass. Our air is thick and difficult to breathe. We need more trees and to do away with the poisons.
72. Weeds as a fire risk is something of a myth. Mostly, if there are enough native trees, there is less fire risk. When trees are cleared or a catastrophic fire takes down a poorly managed forest, then weeds take over and probably do create a fire hazard but cancerous herbicides still aren't the answer, because what is going to grow after those 'weeds' wilt? And what is the environment going to do with the herbicide runoff. We need to find better solutions, such as using copters and drones to spread seeds of 'weeds' that we prefer and a great variety of seeds of 'weeds' with a spectrum of life cycles so that they don't all die at the same time when colder weather or dry seasons hit. And we should spend tax money on tree planting rather than herbicides.
73. To the Boulder County Commissioners, I write to express my deep concern about the use of pesticides/herbicides on public land in our county, especially aerial spraying. The evidence, such as drifts up to 3 kilometers, clearly highlights the risks it poses to our organic agricultural farms, wildlife, soil, and waterways. It is alarming that Boulder County leans more on the advice of Bayer/Monsanto/Envu employees rather than our own experts at CU. Dr. Robert Brackenridge from CU has provided a pesticide-free weed management plan, which not only aligns with scientific recommendations but also offers a sustainable model for other counties. A few key points I'd like to emphasize: 1. Opposition to Pesticides: I strongly oppose the use of pesticides on public land. State law mandates weed management, but not specifically pesticide use. 2. Moratorium and Science-based Process: A halt on pesticide use is imperative until a more comprehensive, science-driven process is established. This process should heavily involve ecologists, local nonprofits, and community leaders, akin to the Fireshed Working Group's approach. 3. Pilot Program for Targeted Grazing: Implement a pilot program, redirecting weed management funds, to explore targeted grazing of weeds using regenerative practices. 4. Stricter Pesticide Approval: Adopt a stringent pesticide approval process, especially considering that many products used by Boulder County failed the City of Boulder's criteria. 5. Monitoring & Testing: Regularly monitor spray sites and adjacent water bodies to gauge the impacts on non-target entities, including water, soil, and organisms. The county should also fund water testing for Open Space lease-holders and neighboring areas to determine any pesticide residues. 6. Transparency: Boulder County should maintain and publicize all pesticide application data from the past five years, preserving it for potential

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environmental toxicity studies. 7. Root Causes: It's crucial to understand and address the root causes of noxious weeds, rather than just tackling the visible problem. 8. Soil Health: Please clarify how the use of pesticides aligns with the county's soil health initiatives. Evidence suggests that soil untouched by fertilizers or chemicals can retain up to 50% more water. In summary, Boulder County must prioritize the health of its ecosystems, residents, and agricultural endeavors. Adopting a holistic, scientifically-backed approach towards weed management without compromising the environment is not only feasible but essential for our collective future. Thank you for considering my concerns.

74. Well managed grazing and integrated pest management are effective without negative impacts from herbicide use.
75. Professors at CU have told leadership at POS and commissioners that weeds are not necessarily a bad thing and do not always pose a threat to ecology or biodiversity. In fact, they have peer reviewed studies showing that some, like cheatgrass, are quite beneficial and is not a fire hazard. In two public fire events, all fire experts agreed that cheatgrass is not a fire hazard, nor any grasses and that mitigating trees is a far better use of public funds for fire mitigation. We all agree that biodiversity is important, but the public agrees with scientists and environmental engineers in that using poison on the land is not worth controlling one weed; especially a List C weed. Bayer employees should not be selling their products, like James Sebastian and Mr. Nissan. It is a conflict of interest. Public servants should follow the will of the public they serve and make decisions that are for the public interest, not their own budgets.
76. I have heard that the OS Director had conveyed to citizens that she has not heard my negative feedback regarding BCPOS current weed management practices. She is highly mistaken
77. Having studied the matter closely, I strongly disagree with the proposition that chemical herbicides need to be part of the weed management plan for our BoCo open space. I do not consider them to be safe for our soil, for our wildlife or for us.
78. Mowing very effective
79. Dr. Robert Brackenridge from the University of Colorado has a weed management plan that does not use pesticides.
80. More in depth ecological research is needed on impact of herbicides before the next policy can be approved
81. Follow the science. The herbicides Boulder County wants to use are toxic. They will negatively impact our ecosystem for decades.
82. With other options available the use of chemicals in nature is not necessary. Listen to and partner with the



farmers and land owners to come up with a healthier more eco-friendly solution.

83. Our earth is being poisoned. Mowing and goats are best.
84. Managing weeds is important, but killing off non-targeted plants is detrimental to pollinators and native plants. Using more targeted controls such as goats can enhance weed control without the negative consequences.
85. No mention of wind conditions, as we have windy days it would be good to add a mph do not spray designation.
86. A buffer zone next to trails (5-10 ft on either side?) should also be kept free of invasive species of all categories, to reduce spread to other areas.
87. I know your task is Herculean, but the spread of many weeds NOT on the A,B or C lists concerns me greatly. An example: curly dock has spread county-wide this year due to increasing seed bank and spring moisture. Intense early collection would have cut down the spread for next year enormously. Use WRV and other volunteer groups! Advertise like mad--make it seem fun. (It can be).
88. I am very concerned about the building toxicity of forever chemicals. As we know, the EPA is not the best watchdog for safety. We need to be concerned for pollinators, of run-off, of unknown chemical reactions when herbicides mix.
89. The harmful effects of herbicides to humans, animals and plants are not worth it for getting rid of weeds. Other approaches should be used.
90. Herbicides have negative impact on the ecosystem as a whole as well as human and pet health. Being sprayed by helicopter or drone would impact the health of our air & community. PLEASE don't do this
91. Goat grazing for weed control should ONLY be used in locations where there is no risk of contact with wild bighorn sheep- based on location and how far individual bighorn sheep can travel, NOT based on any assurances by companies who provide goat grazing that the goats will be contained, they will prevent contact by fencing, etc. Goats can get out, fences can be compromised, and so on. The plan mentions a CPW agreement about not using goats "west of 36" - what about Rabbit Mountain, where bighorn sheep could easily occur? Also consider other areas that may not be west of 36 where goat grazing may pose a risk to the St Vrain bighorn sheep herd. I think goat grazing for weed control has a place, where it does NOT risk decimating bighorn sheep herds through disease transmission, which has been well-documented.
92. Though I do not understand the complexities in controlling weeds I do not understand how spraying herbicides into Boulder county spaces is worth the health risk for humans or the natural world. If we need

to do boots on the ground and targeted approaches for herbicides I can approve. In fact, I come from two generations of family who work in this field and understand the need for some help to combat tough issues with the natural world. But as a resident of Boulder County for more than 35 years I am truly despondent over the direction that Boulder has gone in the past 10 years. If what is happening now was the choice they made in the 50's rather than the open space and natural world protections that were established, think of how incredibly worse things would be now! I especially protest that it appears, though transparency is lacking, that human behavior, dense and cheap housing as well as exposed power lines are a much bigger threat to mitigate fire danger. We can only "control" the natural world so much. We need to face it that we and what we build and how we live are what is the real danger. Spraying chemicals from drones and airplanes does not seem like a choice that should be considered until we tackle and control the real problem for the natural world. How humans live. And Boulder is turning into a messy ant farm that serves the wealthy, CU and tourism. As a teacher I have watched how Boulder politics has been slowly killing public education as well as community. But I will stop there. My point is, spraying herbicides from drones and planes is not going to solve huge problems that Boulder County has created. Thank you for reading this!

93. I strongly oppose the use of any chemicals on our land. We need to protect the diverse pollinators and we have enough chemicals in our world already- causing a breakdown of ecosystems and the health of humans and animals.
94. It is most important to not harm bees. Why is the discussion just about weeds?
95. Some of the most controversial herbicides on the market including 2,4-D, Dicamba, Glyphosate, and Indaziflam are being sprayed throughout our open space, along with many others. State law requires Boulder County to eliminate all List A weeds and to have a "management plan to stop the spread" of List B species—although nowhere does the state mandate that this need be accomplished with herbicides. I am opposed to pesticide use on public land. I ask for a moratorium on pesticide use for List B and List C noxious weeds, as well as weeds that are not on Lists A, B, or C.
96. Regarding: Follow an integrated approach using all available treatment tools to eradicate weeds, including herbicides, following best management practices to minimize negative effects. I'm in support of an integrated approach with scientific research and datasets that scientifically demonstrate the herbicides benefits without collateral damages to non-natives and aquatic environments. Use other treatments (e.g., mowing, grazing, hand pulling, biological agents) should be used 1st. Regarding: Targeted herbicide use as the primary tool for eradication of noxious weeds to maximize the ecological restoration benefits of this treatment method, acknowledging they are EPA approved and have demonstrated effectiveness with minimal negative effects. The definition of "targeted" cannot include broad arial spraying. Drone spraying may be acceptable if programming allows for specific plants.
97. We do not need to employ the use of controversial herbicides to control weeds. We live in Boulder County

for crying out loud- can't we do better here?!

98. Here are my additional thoughts: I am opposed to pesticide use on public lands. State law does NOT mandate the use of pesticides for ANY weed; it mandates varying levels of management, which need not include pesticides. Since the County is currently spraying herbicide to attempt to control more than 65 species on the Colorado Department of Agriculture's Noxious Weeds Program Lists B, C, or the Watch List, I am strongly requesting a moratorium on pesticide use for noxious weeds that are currently on both List B and List C, as well as weeds that are not on Lists A, B, or C. What, if any, water testing has Boulder County conducted at spray sites, along impacted ditches, in surface water, and in groundwater. If such testing has been conducted, where and how and when have the results been made public. Boulder County should pay for Open Space lease-holders and their downstream residents to have their water tested for impacts of pesticides. Boulder County should retain and post every pesticide application dating to 2017. Further, the County should ensure that historical data is retained for use in future environmental toxicity studies.
99. Boulder County should NOT be using toxic chemicals to manage weeds. My father died a horrible death from Parkinsons after being exposed to pesticides for years. He worked for the City of Boulder for 30 years and was exposed repeatedly to these toxic chemicals he was told were "safe". Boulder County aerial sprayed toxins directly behind our home in Lyons for hours causing our neighbors to be directly exposed including children. I left our home for several days with my own children. Best management practices need to consider the toxin risk to the public and wildlife. Using the theory that spraying our way out of wildfire risk is fear based. Land managers have a responsibility to look at real science not ones backed by the industry. Aerial spraying toxic chemicals should never be used.
100. I would like to discourage the use of 2,4-D, Dicamba and Glyphosate. Maintaining soil health, wetlands and waterways should receive the highest priority before use of any chemical tools.
101. Use goat herds and keep the birds and bees alive
102. No chemicals should be added to the environment
103. Involving citizen volunteers to help hand-pull weeds on open spaces, and share stewardship responsibility would make sense.
104. Herbicide use to control noxious weeds should be the absolute last resort and ideally never used. We need to protect biodiversity and our water supply. I would like to see more use of grazing on open space lands to control weeds and more studies on regenerative agriculture and natural weed control. Boulder County has the resources to do the right thing.
105. Boulder County needs a pilot program, using weed management money, for targeted grazing of weeds using regenerative practices. It's time for the County to be paying regenerative land managers to manage

weeds through targeted, strategically timed grazing.

106. Pesticides and herbicides are not a safe option for weed management. Are we so desperate to remove weeds that it is worth the known health risks to both humans and wildlife, water and soil? Which is worse: death by fire or death by cancer from chemicals? There are no 100% perfect answers in life, but by revising and updating this weed management plan we have a rare opportunity to make a change in the right direction. Let Boulder County choose the health of people and the larger ecosystem over aesthetics. We have deliberately been given the power to choose for our own county exactly HOW we remove the weeds, so WHY would we consciously choose a method we know to be harmful to the health of us and the ecosystem, the water and the soil? We are often looked to as an example of a city that prioritizes human health and open spaces, but is that all an empty facade for appearances sake or will we back up those priorities with our policies? This is a decision point. California is another fire-prone state, and they have been leading the way with other forms of management- why could we not look to some of their examples? Specifically, when I read about “inaccessible” areas that are being used as free reign to aerial spray, I wonder what areas are inaccessible to goats. Why could goats not be used in those areas? Would you drink the water 50 feet from an area you know was sprayed by a drone? Have you even tested that water for pesticides and herbicides? (That was rhetorical, the answer is no. Why not? Are you afraid of what you might find? This needs to change.) In pursuit of less fire risk are we in search of barren landscapes with no greenery whatsoever? Just a dirt plateau of nothing? Because that’s what a fire risk of zero would look like in our dry climate. If we’re allowing some plants to live while choosing others that must die, then I don’t really think fire risk is the only issue at play here so lets not use that political rallying point as an excuse. I think weeds are shouldering a lot of blame here. Yes, fire is an issue, but when you’re spraying herbicides it’s not just the weeds you’re hoping to eradicate that will be harmed. And anyway there are other options. If we’re going to allow rampant chemical use in this so-called nature-loving community, one has to wonder if we’re any better than a random county in the Midwest, with chemical companies making millions of dollars off us. How desperate is our need to mitigate ALL risk? But while fire risk is known, the same cannot be said of herbicides and pesticides. How long do they stay in the environment? How many species have it in their bodies and are being impacted a year after spraying? How many children will develop cancer as a result of playing in these carefully preserved open spaces because we chose the cheaper and easier route in the short-term: spray away our problems. Don’t be the person who makes that choice for so many who are voiceless: the children, the frogs, the fish, the worms, the birds... you have been given this responsibility with the understanding that you would be a voice for the community, so be that voice. Don’t tell my young daughters you couldn’t come up with a better solution. We can fly to the moon but we can’t find another way to mitigate fire risk? And if none of the ecological health risks will persuade you, what about the ticking time bomb of the cost of these decisions 20 years from now when ecosystems are destroyed and people are dying in even greater numbers because of a choice that chose the short term ease of chemicals? Are we checking boxes here for the sake of getting something done or are we actually focusing on solutions? This plan is checking a box in a dangerous way and the herbicide use is the most out-of-control part. You have the

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power to say no to this, so please SAY NO.

107. There is not information or data on how dangerous this is to humans long term

108. I am not opposed to using Non-toxic herbicides like 20% vinegar and Avenger citrus herbicide. Please visit The BioIntegral Resource Center a science-based IPM source of great info on non-toxic weed management

109. I am opposed to herbicide/pesticide use on any public land. As a Ph.D. environmental engineer with a specialty in water quality, I am particularly concerned about pesticide impacts on watersheds and their inhabitants and users. What water quality testing has the County done of groundwater and along waterways impacted by the County's pesticide usage? In addition to a much more stringent process for approval of pesticide usage on public lands, the County must implement a monitoring program for spray sites and downstream water bodies. The monitoring program must examine potential impacts on water, soil, aquatic organisms, insects, and crops affected by spray drift. Boulder County needs to keep usage and monitoring records long-term to aid in future toxicity studies.

110. Spraying toxic chemicals does more damage to our water and air than the weeds themselves. Mow them pull them or use a non toxic method.

111. Please note how important it is NOT to spray near horse, grazing areas, such as the horse property to the west of table mountain. Thank you, horse owners at Juniper Hill Ranch

112. DO NOT SPRAY POISON ON OUR COMMUNITIES. ABSOLUTELY NOT.

113. I am opposed to the use of pesticides on Boulder County lands. There needs to be more work by the County to utilize weed control methods that minimize the impact on native species, soil organisms, and aquatic environments. The County should be a leader in weed control practices, using local data to make science-based decisions. The proposed weed management plan is lacking in data specific to our area and represents a "status quo" approach to complying with state requirements for weed control. Frankly, I am disappointed at the lack of science-based reasoning and innovative solutions in the management plan. I am fairly experienced with environmental and public health planning, holding a Ph.D. in Environmental Engineering and being a registered Professional Engineer. As a County, we have the resources to do much better.

114. aerial spraying doesn't seem to consider the lives of wildlife.

115. 1/8 of a mile away from municipal boundaries is still far, far too close, as spraying does not respect these boundaries and winds can carry herbicides onto private and public municipal lands.

116. Water is a precious resource in Colorado. The runoff from aerial herbicides will make their way to

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agricultural producers who don't want to use chemicals. Natural solutions are the way to go.

117. It's nice to see grasslands restored to being dominated by native species rather than monocultures of cheatgrass. If the unknown effects on soil microorganisms is detrimental I would argue that the health of the native vegetation after Rejuvra applications indicates that applications are not detrimental.
118. Saturating our environment with harmful chemicals to maintain a perception of order has detrimental effects on our human health and wellbeing
119. The effects from these chemicals have a far greater risk to our health, the longterm effects are tremendous. PLEASE STOP!
120. Herbicides should never be used on public lands because they threaten biodiversity. Aerial spraying especially should be avoided because it is impossible to control the application. There are many other effective options for weed control that do not endanger health. Boulder county claims to be environmentally responsible, please be a leader in pioneering nontoxic weed control.
121. There's many questions about this plan that need clarification. 1 being a property owner surrounded by open space. I have found that the application is no way controlled! We have been chemically trespassed several times and the state regulators are useless in their enforcement! So has boulder county used pesticide targets to monitor chemical drift? 2. Over the years of this program how many times has boulder county open space youth corps participant been brought into areas without any knowledge of being exposed to these cancer causing agents ?? Most of these people are minors and having a child participate in this program I was never informed that they were working in these areas!! 3. Are any of Boulder County employees or advisory board members who have drafted this document have any connections with the petrochemical suppliers? Or have been lobbied or have investment in these corporations? If so they should recuse themselves from having any input into this document! 4. It appears that there was no consideration for the organic certified farmers that use the water out of this watershed. So has Boulder county monitored and tested the waters that we the people are drinking and what these farmers are using? This could cause serious harm to the farmers organic certification! 5 has boulder county considered the implications of possible lawsuits, if human beings are harmed by these practices? 6 as far as these chemicals are approved by the FDA as it's well documented that that Agency is under corporate capture! As a stakeholder I am very skeptical. 7. As a stakeholder I strongly recommend that Boulder County weigh the costs of these programs & compare the benefits of a holistic approach. 8 the best way to resolve this issue is put it to a vote to the taxpayers of Boulder County and bypass the non elected parliamentarians that make these policies!
122. Using pesticides will cause more problems
123. A close friend's organic farm in Boulder county was sprayed by glyphosate drift...and the overspray was done on county owned ag land by aerial fixed wing aircraft methods. He lost his entire vegetable crops

for the season and after long lawsuit ultimately lost his farm before he got a limited settlement from the registered pesticide applicator. Got no timely or useful help from the Colorado Dept of Ag, Pesticide Division. I helped him with his lawsuit, providing support in field documented drift demonstrations to prove case to court. This is an example of how useless government policies are to prevent major economic, environmental and public health disasters from pesticides, including a major herbicide on the BCPOS Weed Management Plan, in fact the largest selling herbicide in the world, glyphosate.

124. I support the eradication and or reduction of noxious weeds on open space and natural areas in Boulder County. However, I am writing to weigh in on the draft Boulder County Integrated Weed Management Plan and to share my own experience with aerial spraying by helicopter at Table Mountain in Boulder County. Our experience with Boulder County's weed management in our neighborhood negatively impacted the people, farms and ranches without achieving what I think was the eradication of cheat grass on Table Mountain. I will explain our experience as well as how and what it could look like if community collaboration and best regenerative land stewardship practices for weed management had been employed. When Boulder County used helicopters to do aerial spraying on Table Mountain in unincorporated Boulder County, this was our experience as a property that runs into Table Mountain. There was: No transparency ahead of aerial spraying, despite Boulder County's bullet #3 in the weed management objective statement that states "3. Communicate: Provide timely and transparent public notice about use of herbicides." We had zero advance notice or any notice whatsoever. Spraying herbicides indiscriminately on the mesa along Tollgate Ditch, which supplies critical water for the organic farms and ranches in our neighborhood and beyond. A line in the 2023 Boulder County weed survey notes that aerial spraying will be "at least 50 feet" from waterways. This was not the case. The helicopter went up and down the mesa for two days and the Tollgate Ditch sits right at the border to Table Mountain and property owners. The herbicide drifted right into the ditch. Collapse of bee colonies of more than 100,000 bees located in a yard whose property runs up to the Tollgate Ditch and is adjacent to Table Mountain. Contamination of Tollgate Ditch water that was then applied to soil and crops on Boulder County organic farms and ranches that use the water to irrigate crops Return of thriving cheat grass in the area that was sprayed. We are a pesticide-free, organic 10-acre ranch where we have spent 5 years raising sheep to eat our noxious weeds on our property and to fertilize our pastures to bring them back to a healthy state. Through sheep grazing and application of composted sheep, horse and chicken manure, and reseeding with native grasses, we have been able to get rid of many noxious weeds naturally since regenerative agriculture has been proven to be a healthy and effective way to restore natural habitats and build healthy soil. When Boulder County hired a helicopter to spend two days spraying Table Mountain, which backs into our property and dozens of others, we watched as the pesticides drifted right into the water running in Tollgate Ditch, our horse pastures, onto the feed and hay and grasses where the horses and sheep on our property graze, and then into our house through our open windows. It took a while for us to figure out what was going on with the helicopter flying low back and forth on the lower side of the mesa which meets our property. I walked up to see what was going on and was inundated by a cloud of chemicals that made me turn back, along with one of my horse boarders who was out to feed her horse.



Other horse boarders also had to stop mucking and feeding their horses and retreat to avoid breathing in the toxins. My daughter experienced exacerbated asthma when she woke up during the application, as did three other children from a family whose house also sits along the Tollgate Ditch five properties south of us. Just south of me, the spraying collapsed more than 100,000 bees in a colony located on Ogallala Organic Farm, formerly Pastures of Plenty. According to the Boulder County Integrated Weed Management Plan, noxious weeds can cause “pollinator populations that depend on the native flora (to be) likely to be negatively impacted as these native species may be displaced by the invasive grass species.” I am no scientist, but before the pesticide application, there were more than 100,000 bees thriving, pollinating area farms that no longer exist post-pesticide application. If one of the key drivers of weed management is to protect pollinators, why would Boulder County ever spray pesticides on properties that literally back into organic farms and private and commercial bee hives? Furthermore, the spraying went right into Tollgate Ditch, our main supplier of water for irrigation. According to the draft Boulder County Integrated Weed Management Plan, noxious weeds cause “impacts to water quality and quantity by invasive trees such as Russian Olive or Tamarisk, and plants such as Eurasian milfoil, hairy willow herb, and purple loosestrife.” That is true. However, my question is what are the human and wildlife impacts of spraying pesticide directly into our main irrigation water source? Boulder County spent two days spraying pesticide into the primary water source for our farms. That water flows directly onto Boulder County farms and ranches to feed crops, contaminating the soil and putting pesticides on food sold in Boulder County as organic. Wildlife, including native birds, drink directly from the ditch. While the Boulder County survey says that herbicide application will be 50 feet from a water source and 100 feet from property lines, this didn’t happen in the Table Mountain application. The herbicide was thick enough even 400 feet inside our property line that we had to turn back and go inside our house and close all windows rather than be outside in the cloud permeating our property. Tollgate Ditch itself got a full dose. The visible results of the spraying? Cheat grass is thriving on the mesa where Boulder County dropped the pesticide. And the reasons are really clear. You can’t drop pesticide down and not tackle the root cause of why noxious weeds are thriving in an environment. That’s just a very short-term Band-Aid solution. Unless you take the best-practices measures to improve the degraded soil and replant native seeds, the extremely high winds here will just deposit more weed seeds in the areas where there are none. Spraying cheatgrass with pesticide and hoping that native grasses will magically appear is not a proven strategy and is a waste of taxpayers dollars, a reckless use of pesticide and blatant threat to the organic farms who rely on ditch water to grow their crops and to the bee keepers along our ditch who have spent years creating natural, pesticide-free habitats on their properties to produce honey. It’s also a threat to the health of we families who live here and who have invested time and effort to create pesticide-free habitats for a variety of birds, including bald eagles, red-tailed hawks, bees, deer, and elk. If you would like me to bring you on a walking tour to see it, I’d be happy to show you what the mesa looks like post-spraying. If Boulder County truly wants to protect pollinators, restore native ecosystems, protect water systems and reduce wildfire risk as the draft plan states, it’s critical that Boulder County move out of a dated pesticide-Band-Aid model and adopt modern-land management practices rooted in soil health, regenerative agriculture and land stewardship. Afterall, the county has excellent regenerative



agriculture grant programs and a fantastic Soil Conservation Conference that it holds every December. The county has the knowledge and tools to adopt the practices it promotes to the public. It's time to take the leap to integrate it more fully into its practices to become a national and perhaps global leader in land stewardship. And that includes working directly with adjacent landowners ahead of time to see what resources are available in advance to help win the battle against weeds. Taking A More Holistic Community Approach What would be the alternative solution to the current tactic of merely dropping pesticides on Table Mountain and crossing fingers that cheat grass doesn't return? That's an answer for soil and regenerative land experts, but we have spent five years running sheep on our land where there were too many noxious weeds to count when we first bought the property. The sheep have helped us restore our pastures by eating weeds and their seeds, fertilizing the soil. From there we have replanted native grasses. This process could be easily replicated on Table Mountain as a natural, far more effective way to regain long-term health of the hillsides of Table Mountain. If the county budget only allows the county to practice regenerative land stewardship in only a few places each year, then spend the time really doing it right and flag other areas for another phase of land management. Moreover, the county should take advantage of the resources we landowners can offer and practice land management in a truly communal way. We literally have tons of composted manure we produce and give away for free to local gardeners and farms. We would more than gladly work with Boulder County on giving you free weed-free, composted manure that could be spread on the mesa. Afterwards, you can drop native seeds in the spring when rain is more abundant and there is no need for irrigation, which is near impossible on Table Mountain's hillside. Once native grasses take root, they outcompete weeds. No land exists on an island, so approaching land management with a view of involving and collaborating with all landowners, public and private, will make all endeavors more successful. Sincerely, Tori Peglar Director, Juniper Hill Ranch Camp 8550 North 39th St. Longmont, CO 80503 Read the great article about our camps in Boulder Lifestyle Magazine 303.444.4041 <https://www.juniperhillranch.com/>

125. Our family moved to Boulder in 1970. I have spent considerable time outdoors in my decades here and was appalled to recently get educated on the fact that BCPOS is using 2,4-D, Dicamba, Glyphosate and Indaziflam, all very controversial, in addition to many many others. The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms. I agree with Tim Seastedt's points-- that the land has been harmed by the monoculture of overgrazing of cattle; that cheatgrass is not that much of a threat to biodiversity; that research needs to be done; that other stakeholders, like scientists, neighbors, local organic farms, and environmental groups need to be included, not just cattle ranchers. My survey answers above are meant to indicate that an immediate PAUSE is needed in BCPOS chemical weed management until a science-based approach can be confirmed. Herbicides the BCPOS currently plans to use are persistent, carcinogenic and mutagenic, destroy soil biodiversity, and harm non-target species.
126. The County weed management plan provides a lot of information pro-herbicide use and neglects the evidence that herbicides endanger water, wildlife, domestic animals and humans, and that there is

inadequate research about their long term effects, not just single active ingredients but their toxicity in product mixtures and in the soup of different chemicals in the many herbicides that the County currently uses. There is also no information given about how very small doses of exposure, which can mimic hormone dosages in humans and other animals, can be extremely toxic.

127. for major revision. To protect public and ecological health, a moratorium on synthetic herbicide chemical applications should be instituted in the meantime. Please ask that independent, non-petrochemical company funded research results be used. Require an independent, objective examination of the possible benefits together with the risks for every pesticide used in our public open space lands. The public is asking for a change: towards at least reducing the use of these poisons. So, ask that a Plan be developed that clearly moves in this direction. References Cited: 1. Mungroo, M.R., et al., Development of anti-acanthamoebic approaches. *International Microbiology*, 2021. 24: p. 363-371. 2. Siddiqui, R., et al., Antiamoebic Properties of Laboratory and Clinically Used Drugs against *Naegleria fowleri* and *Balamuthia mandrillaris*. *Antibiotics*, 2022. 11. 3. Wang, Z., et al., The neonicotinoid insecticide imidacloprid has unexpected effects on the growth and development of soil amoebae. *Science of the Total Environment*, 2023. 869. 4. Adigüze, S.K., The possible cytotoxicity and genotoxicity assessment of indaziflam on HepG2 cells. *Human and Experimental Toxicology*, 2023. 42: p. 1-8. 5. Tissot, A.G., et al., The silence of the clams: Forestry registered pesticides as multiple stressors on soft-shell clams. *Science of The Total Environment*, 2022. 819. 6. Clark, S.L., et al., Evaluating winter annual grass control and native species establishment following applications of indaziflam on rangeland. *Invasive Plant Science Management*, 2020. 13(3): p. 199-209. 7. Glenna, L. and A. Bruce, Suborning science for profit: Monsanto, glyphosate, and private science research misconduct. *Research Policy*, 2021. 50. 8. Alba, C. and M. DePrenger-Levin, Incorporation of indaziflam (Rejuvra®) into Boulder County Parks and Open Space Weed Management: A Post-Fire Assessment. *Denver Botanical Gardens Project Report*, 2021. 9. Meyer-Morey, J., et al., Indaziflam controls nonnative *Alyssum* spp. but negatively affects native forbs in sagebrush steppe. *Invasive Plant Science Management*, 2021. 14: p. 253-261.
128. No chemicals, plain and simple. They're not good for people and they're not good for the planet. I support any other effort and method, but for goodness sake... no chemicals.
129. Intent of the Noxious Weed Act – is to improve ecological value of lands in Boulder County The noxious weed act (Article 5.5- COLORADO NOXIOUS WEED ACT) is very clear in providing intent to improve the ecological value of lands in Boulder County. The rule of construction (Section 35-5.5-102- Legislative declaration- rule of construction (1)) states that advisory committees seek “those methods which are least environmentally damaging.” The plan does not demonstrate that herbicides are a least environmentally damaging method. It is unclear whether the herbicides are safe to use in sensitive ecological areas in Boulder County. This is because: 1. Measurement of effectiveness is limited to ability to destroy/reduce the target organisms. 2. No other measures are mentioned. There needs to be a measure of the actual

application rate based on environmental samples and where the herbicides end up in the ecosystem. 3. There is no organized ecological risk assessment that considers pathways such as runoff, percolation into soil, drift during application, nor whether the herbicides may volatilize from plant and soil surfaces and be transported downwind. 4. There is no discussion about the likely effects of herbicides on ecosystem functions or on non-target organisms such as: pollinators; sensitive native plants; soil microbial communities; soil invertebrates; nearby aquatic organisms; or birds that may feed, loaf, or nest in treated areas. 5. There is a short appeal to safety if application requirements are followed, but no discussion why these requirements would be protective of Boulder County ecosystems, or Boulder citizens, especially children, accessing these areas during or after application. Recommendations: Per Section 35-5.5-103 – Definitions, (16) (d) describes a “Noxious weed” as an alien plant or parts of an alien plant where the direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems. The same idea should be applied to use of herbicides, that they NOT be detrimental to the environmentally sound management of natural or agricultural ecosystems. To achieve this, at a minimum, please: 1. Use an ecological risk assessment approach to develop a more comprehensive model of pathways and receptors representative of the targeted application areas. 2. Implement a more thorough sampling method that determines where the herbicides end up and what the true application patterns are and what the site-specific exposure concentrations are for the non-target receptors at each site. 3. Include an uncertainty analysis of assumptions and likelihood that assumptions used would be protective. 4. Do the above pursuant to Section 35-5.5-102- Legislative declaration- rule of construction (1) “science-based methodologies, peer reviewed studies, or any other method that is based on credible research”

130. I agree with professor Tim Seastedt’s comments. Review of the Draft Boulder County Integrated Weed Management Plan, Oct 8., 2023 Tim Seastedt, Professor Emeritus, Dept. Ecology and Evolutionary Biology, CU Boulder. OVERVIEW The County weed management plan is not being driven by ‘best science’. Rather, to use the terminology of this program, it is being driven by ‘what tools are in the toolbox.’ The key example of this involves the current emphasis on cheatgrass. Without vested interests touting the ability to kill cheatgrass (and any other seed in the vicinity) with Indaziflam, the current cheatgrass effort that uses high cost and unknown risk procedures would not exist. Until new chemicals appeared, cheatgrass as a weed issue was largely ignored in favor of those species that were vulnerable to the chemical stockpile. This leads one to the conclusion that we kill it now because we can, not necessarily because we need to. As detailed herein, cheatgrass is neither a known or demonstrated threat to native biodiversity or an increased fire risk relative to other grasses in Boulder County. Cheatgrass is not a desirable species; its control is appropriate under limited conditions, but in terms of potential threats, it simply does not deserve the attention or taxpayer money it is receiving. This evaluation generates the need for a larger assessment of weed science and the ‘culture of weed management’, which I have experienced from 30+ years of working on invasive plant species. We (ecosystem and community ecologists) documented our perspective on this long ago (Luken and Seastedt 2004) and while the current weed management report is certainly standard weed management culture and verbiage (although lacking in current references justifying the program), it still

contains the same warts and blind spots observed 20 years ago. These issues include the exploitation of xenophobia/a sense of place (justified or otherwise) in a subset of stakeholders, herbicide use that subsidizes unsustainable land practices, and undue influence by vested interests who profit from a program that is unbalanced in favor of chemical control. Of all weed management techniques, chemical control comes with the most uncertainty in terms of risk effects on living things. The County program bases its 'best science' on studies performed in areas not representative of our climate, soils or vegetation communities. I term this approach 'science-informed management'. Best management is based upon empirical findings obtained in our area, known as 'science-based management'. While the former approach is what one must do in the absence of local data, local data must be used to drive best-management restoration. The current weed management program can easily be transformed to science-based management if it recognizes weed science as a program that is nested into a broader framework and not 'siloed' as it has been historically. This management framework's challenge is to maintain and enhance quality of life values while addressing relevant issues associated with the climate crisis. We know how to do this; references to this broader best management effort are cited herein. Comments and points of emphasis

- 1) The current weed management program developed from weed management programs developed for agricultural purposes 70+ years ago. The program has not been sufficiently updated and fails to provide an adequate vegetation management program for many of the more natural areas in Boulder County.
- 2) The far more urgent climate crisis now requires weed management to be subsumed within a climate mitigation and adaptation program. The program should not be considered a 'stand-alone' activity.
- 3) The solution is to create an actionable, co-production science program that nests weed management within a larger framework focused on nature-based solutions for climate mitigation and enhancement of biological diversity.

Key assumptions and premises: The County's multiple ecological and land management programs have, to my knowledge, never undergone rigorous external scientific review. Assumptions and 'facts' used in management to date have not been vetted. The current process should undergo independent scientific evaluation to establish credibility. Best management practices demand that scientists, stakeholders, and managers participate in the actual formulation of the program, not a review of something written by a single focused group. The presence and activities of invasive species are a consequence of past human actions, but whose impacts now are potentially idiosyncratic or orthogonal to other environmental change drivers. There also appears to be lingering xenophobia regarding recently introduced species that influence actions. The knowledge base for invasive species now has matured to a point where the use of biogeographic origin of species in management decisions are rarely if at all relevant. From an ecological perspective, invasive species are of both native and non-native origin. What is relevant to plant management decisions involves the ecological services and disservices provided by a species within the context of its environment, and how those services influence management goals. While negative impacts (disservices) from invasive species have been historically dominant in the literature, the recognition of positive impacts in the literature is now rapidly increasing. Species impacts should be examined independently of generalizations based upon biogeographic origin. We are now in the Anthropocene, where human impacts are driving environmental changes, including climate change. All ecosystems-- natural, agricultural, and built environments-- are undergoing

directional climate change in addition to an assortment of more localized anthropogenic effects. Environmental programs developed prior to directional change are unlikely to be efficient for future actions. The management goal ‘to fix it’ has new rules; the baseline is changing and management needs to recognize new stressors. Invasive species management should no longer be seen as a stand-alone management focus or program. Rather, invasive species management should be embodied within a climate mitigation framework, such that decisions involving ecosystem services and human well-being are explicit and incorporated into management decisions. A cost/benefit analysis, including assessment to direct and indirect climate mitigation and adaptation, are best management practices. The current climate crisis demands action, and actionable science and co-production science approaches are needed to address invasive species management. This can only be accomplished if academic and research scientists work at scales appropriate for managers and stakeholders. Managers need both scientist and stakeholder partners to stay current with cutting-edge management solutions. 7. With specific regard to use of pesticides in management, it is unacceptable to approve any large-scale applications without a complete understanding of non-target impacts. We now have the tools to assess these impacts and to proceed without this knowledge is unacceptable. This is particularly true for any chemical not rapidly broken down by microbes in the environment, as transfers to non-target areas are often possible. Management must be based upon science-based rather than science-informed information. An example of science-informed spin used in management: An article in the Boulder weekly (Matuska, April 20, 2023) on cheatgrass had a scientist state: “Boulder is faced with this huge challenge of a ton of this highly flammable and invasive weed on our open space,”.... “And with [its connection to] the recent wildfires, biodiversity loss and impacts on soil health, we have to do something about those challenges and mitigate those risks.” This is a classic example of a science-informed but not science-based statement used to advocate for an expensive management program that can harm climate mitigation efforts at multiple year scales. Sadly, it parallels earlier, failed programs used against other introduced species. Boulder County has had a legacy of “leading with pesticides”, a program whose multi-decadal track record is not particularly conducive to believing that pesticides are, in fact, a significant part of sustainable solutions to vegetation problems. Those who remember the wasted effort using large- area spraying of diffuse knapweed in the 1990s and early 2000s recognize the validity of this contention. Examples of use of science-informed rather than science-based information in the draft report: Bottom, pg 7: “According to the USDA, billions of dollars are spent every year to mitigate noxious weeds or control their impacts.” That is true., but the funds are primarily focused on monoculture crops. This chemical support of agriculture is now being slowly replaced with regenerative agriculture techniques and provide climate mitigation benefits. The report goes on to state “Familiar examples nationally include the winter annual invasive grass Downy Brome (*Bromus tectorum*) which has invaded significant areas of sagebrush-steppe and dry forests in the western U.S.” That is mostly correct but has no relevance to downy brome (cheatgrass) impacts on the Front Range, where the weed was introduced by bad management (historical overgrazing by cattle; the presence of cheatgrass was acknowledged as a major part of the foothills region in the 1970s (Peet 1978). Cheatgrass can also be increased by catastrophic fire, (but not all fires: see the uncited Boulder County report by Markevich et al. 2023). As shown in the supplement to this report, cheatgrass is not

particularly competitive with native species in the absence of land abuse. The "Ecological and Climate Change Impacts" statements on the top of page 8 are irrelevant to the Front Range. On the Biodiversity section (pg 8) "In Colorado, rare native plants, such as the orange mountain dandelion and Ute ladies'-tresses, are under constant threat of extirpation by more aggressive, noxious weed species, such as musk and Canada thistles." Where are the data to support this statement? Musk thistle is now adequately controlled with biocontrol insects except in disturbed areas, where these rare species probably are not common nor well adapted. Smooth brome due to its ubiquitous abundance is likely more a threat to the orchid than Canada thistle? (But we don't routinely kill smooth brome because it is cow food?) Best science demands studies that justify specific management actions. Finally, it would be nice to see a bit of innovation somewhere in this report. For example, attempting small experiments using smut (*Ustilago bullata*) or other microbes on cheatgrass or rust fungus (*Puccinia punctiformis*) on Canada thistle might show stakeholders you experiment with biological controls to the degree you experiment with chemicals? While these biocontrols are known to have limited success, like so many other factors they have not been adequately tested in our environment. Again, one has trouble faulting staff for this lack of staying current on biological controls; the Colorado Agri. Dept. information on biological controls is outdated if available at all. Page 8: From A recent study by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services for the United Nations further states, "invasive nonnative species were a major factor in 60 percent of recorded extinctions of plants and animals." Again, this is a science-informed generalization, but not a science-based fact for the Front Range? Where are the Front Range data of factors affecting our threatened species? "The invasion of downy brome (*Bromus tectorum*) in Western U.S. grasslands has led to an increase in the frequency and intensity of wildfires (Simerloff [sic] and Rejmánek 2011)" (IN THE GREAT BASIN, MY ADDITION) "and salt cedar (*Tamarix* spp.) makes the soil inhospitable to native species by depositing large amounts of salt into the surrounding soil (Bell et al. 2002)" [IN THE GREAT BASIN, MY ADDITION). The salt cedar (*Tamarix*) story has been substantially modified since this 20+ yr old citation (c.f. Sher, A. and Quigley M.F., 2013), and in any event, you can be sure that salt cedar impacts on soils of the Front Range, while unwanted and likely undesirable, do not mimic those in the Great Basin. With the exception of the Arathi and Hardin (2021) paper cited in this report, no other Boulder studies are cited? While I'm an absolute believer that under the right conditions, their Boulder findings are true, i.e., high concentrations of cheatgrass will reduce pollinators, the authors state: "Further studies are necessary to understand mechanisms that facilitate reestablishment of native flowering species, the long-term consequences of reducing invasive annual grasses and to document any residual effects of the herbicide on ground-nesting pollinators." The fact that showy flowering plants attract pollinators while wind-pollinated grasses do not is understood, but why single out cheatgrass for this effect? Yes, the soil surface is altered by cheatgrass, but that then favors another group of beneficial arthropods (Porazinska et al. 2022). Herbicide treatment in larger fields of cheatgrass monocultures using procedures advocated here will create brown fields devoid of plants for a number of years. These brown patches have negative effects on climate mitigation and no immediate benefits to pollinators. Finally, what this treatment does to soil biotic diversity remains unknown. There are no data to suggest that cheatgrass, in our spring-wet environment of the Front Range, contributes



any more to grassland fires than do native grass species. In fact, because cheatgrass senescences and dies in June when other species are green, should a fire start in these patches in late June they should be much easier to control than grassland fires that occur later in the year. Second, there are no data to suggest that cheatgrass harms biodiversity or soil health in the Front Range (see supplemental information). (Biodiversity can be affected at relatively small, local scales by the presence of cheatgrass, but what scale is appropriate for management objectives for biodiversity?) Cheatgrass in the Front Range, with very few exceptions, fails to form the large monocultures observed in the Great Basin. Third, cheatgrass treatments have proceeded without studies of soil organism responses, hence the above statement given to the Boulder Weekly press regarding soil health seems a non-sequitur and is certainly unsupported by science. Finally, cheatgrass has been reported to benefit local soil carbon pools by reducing the abundance of introduced earthworms. This published finding (Porazinska et al. 2022) is in direct conflict with the generalization of cheatgrass effects in the Great Basin, where earthworms are not present. This is yet another very obvious example of managing based upon science-informed rather than science-based facts. While none of this may completely negate other undesirable (but yet to be documented) traits of cheatgrass in the Front Range, it puts its priority as a funded management item below much more urgent activities involved with climate mitigation and biodiversity preservation. The only long-term cheatgrass data from the Colorado Front Range shows that this annual grass declines through time without any proactive management (supplemental information, Figure 2). Boulder findings also indicate that it can decline with appropriate grazing/mowing and fire management. Creating a new and holistic plant management program The new paradigm requires that weed management be nested within and ecosystem management program that uses “Resist, Accept, Direct” approach developed by land managers. The compelling arguments behind the need to remove the classical ‘silos’ of various land management units into a hierarchically organized ecosystem management program are well-documented in the widely accepted paradigm developed by multiple land managers. Thoughts on this are expressed in Table 1.

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Table 1. An ecologist’s Best Management Practices for Invasive Plant Management. This system advocates a merger of ecosystem management and the Resist, Accept, Direct [RAD] frameworks focused at nature-based solutions to climate adaptation and mitigation.

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1. First, do no harm; acknowledge uncertainty [assessments include non-target effects, human well-being, climate impacts]. 2. Recognize that native plant communities may require a selected subset of soil biotic communities. Without the latter, it may be impossible to maintain the former. Do not ignore the soil microbiome in preliminary assessments, and consider adding soil biota amendments along with any reseeding efforts for restorations. 3. Early detection and eradication remain the first line of defense for invasive species. It also is a mechanism whereby uncertainty is minimized. Recognize this as a large time commitment. This is perhaps the only ‘Resist’ component of the RAD framework appropriate for many and perhaps most invasive plant species management programs. (RAD refs: Lynch et al. 2021; Schuurman et al. 2022). 4. Finish the job: Monitor and patrol sites, with particular emphasis on habitats of concern. This has been an established pillar of ecosystem management for decades [Christensen et al. 1996] but appears underemphasized in weed management. 5. Identify the ‘wicked problems’ associated with each

management action and identify rationale for subsequent actions. This likely invokes a 'Direct' decision in the RAD framework. 6. Involve stakeholders in ways that promote equity and inclusiveness. Identify cultural biases and vested interests' assessments and limit their significance in management decisions. 7. Given the uncertain climate, expect and plan for interannual variation in outcomes, and expect surprises [Christensen et al. 1996]. 8. Anticipate new biota and outcomes with abiotic drivers such as extreme events. Consider extreme event contingency plans and how these might structure subsequent management actions that involve expected disturbance-succession processes. 9. Combine invasion science efforts with climate mitigation efforts, emphasizing co- benefits. Make invasive species science an 'actionable science' program by embedding scientists, managers and stakeholders into a collaborative process with continuous engagement [e.g., Beier et al. 2017, Silva et al. 2022].

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The general model is very simple. A public piece of land has management goals which now as a minimum must include climate mitigation/climate adaptation, and biodiversity goals. You monitor the site for an existing status report, and you plan to monitor in the site in the future to assess outcomes of management. All goals are explicit, and you conduct an initial assessment of how particular management actions might affect those goals. Those actions that are approved are subsequently monitored. While this monitoring program can be expensive, short-cuts are possible and well known, as this model has actually been in existence for decades. Weed management objectives are stated upfront, compared with other site objectives, and conducted if approved. Monitoring and assessment of monitoring results is an essential component of any scientific land management program. Vegetation management must become actionable science and a co-production science activity. Efforts need to be vetted not only by weed specialists but by natural and social scientists and the community partners. Programs that lack community partners support will fail. References Beier, P., Hansen L.J., Helbrecht L., and Behar, D. (2017

131. Please no glyphosate in our community!

132. Please see letter from Tori Peglar addressed to you, I am in full agreement with her letter!

133. Pesticides have an important place in our toolbox, but because they have been overly relied upon in the past, it is now critical that we be prudent and limited in their use. Pesticides should not be used for ongoing maintenance, but rather applied to overcome obstacles to establishment of native vegetation. Agricultural practices that repeatedly disturb soil should not be used to justify repeated use of pesticides. The objective is to establish and support healthy ecosystems and soils rather than extractive agricultural practice.

134. Hard to responsibly control

135. It makes no sense in the Rabbit Mountain biodiversity area to use noxious herbicides when you are working to preserve species that depend on the insects and other creatures that exist on the weed. Cheat grass is not that hard to pull and does not create the fire hazard as you maintain. Also the distances away from areas that you have identified to not spray are not sensible. New herbicides are being created that are



## Boulder County Parks & Open Space

non toxic.

136. Organic farms and fruit orchards nearby will suffer from drift no matter how they are applied.

137. Please consider the human health before the cosmetic look of parks and open land.

138. Please don't neuter us.

139. We have lived next to Open Space property for 40+ years and know what weeds can do to damage property. We have to be diligent in our area because of the weed seeds blowing onto our property. If people live in the county they would understand the problems that the Open Space and Mountain Parks face with all the heavy use of their properties, weather related issues such as wind, fires, managing farmland, etc. There are so many issues to address and with all the land that O.S. has purchased there is not enough resources to treat, restore, eradicate weeds, etc. on all this property. Many different types of things need to be considered for spraying of weeds, rotating crops, grazing, closing trails, etc. I wish you luck in the future. You have done a fair job in the 50 years I have lived here in the county.

140. The concept of what is 'weed' needs to be re-examined, and so does the meaning of 'management'. I strongly recommend Inhabitants Film (<https://www.inhabitantsfilm.com>) and the companion webinar given by a Menominee Forester <https://vimeo.com/593393124> for a start- the discussion on invasive species starts at 45min. The binary distinction between good and bad plants for any location is not a simple, clean line, and the militant approach to the perceived bad plant is equally questionable. A wise person says, for every complex problem there is an answer that is clear, simple, and wrong.

141. aerial spraying is too subject to drift, cannot selectively target invasives

142. There are so many ways to holistically manage this without having to resort to the use of chemical herbicides. An Aerial approach with a chemical is more threatening to an entire ecosystem than the weeds themselves.

143. Its a complex set of issues- humans now trying to 'control' what we've disrupted- even if unintentionally; must be done in the no or least chemical use imaginable

144. Dear Commissioners, I am writing to oppose spraying pesticides/herbicides on open spaces and parks (and in all HOAs for that matter). I ask that you oppose BCPOS.- BCPOS will still spray 2,4 D, half of the ingredients in Agent Orange. See article on dangers: <https://www.publichealth.va.gov/exposures/agentorange/conditions/> (<https://www.publichealth.va.gov/exposures/agentorange/conditions/>)- Dicamba, which is used all over our hiking areas and contains who knows which "inert" solvents, emulsifiers, wetting agents, polymers and adjuvants! See article on how it is a danger to wildlife: <https://www.audubon.org/magazine/winter-2022/the-weedkiller-dicamba-poisoning-wildlife-habitat> (<https://www.audubon.org/magazine/>

winter-2022/the-weedkiller-dicamba-poisoning-wildlife-habitat) Released on February 16, 2023. The U.S. Environmental Protection Agency (EPA) has approved labeling amendments that further restrict the use of over-the-top dicamba in Iowa, Illinois, Indiana and South Dakota.- Dicamba drift can stay in the air for 3-4 days, meaning it's adding to the air pollution and being inhaled by hikers, bikers and more.-In the draft ecological risk assessment released (<https://www.regulations.gov/document/EPA-HQ-OPP-2016-0223-0028>) today, EPA said recent toxicity data indicates a "potential chronic risk concern" for adult honeybees exposed to higher levels of dicamba than previously reviewed. There's also additional risk to fish in limited circumstances, the agency said. The draft assessment, open to public comment for 60 days, is part of the ongoing routine registration review for dicamba, a popular herbicide farmers use on soybeans and other crops genetically modified to tolerate it. EPA released the draft along with an updated human health risk assessment that echoed earlier findings.- Glyphosate is water-soluble and is literally raining down on us. It is in our drinking water and harmful to pollinators and our health. See articles: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9101768/> (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9101768/>) And Glyphosate being carcinogenic and banned in the EU: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5515989/> (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5515989/>) BCPOS shouldn't apply a broad ban option with the narrow perspective that all non-natives are "bad". For example, cheatgrass might dry quickly in the early summer but it also greens first in the winter. If there is another winter event, cheatgrass could actually mitigate fire. CU Professor Seastedt, who's been studying cheatgrass for decades, says cheatgrass is not a fire hazard and it hasn't spread in Colorado; as does Lyons fire chief and many other fire professionals. Again, it's too short to be a hazard. AND Cheatgrass is a List C species which means it's "too widespread to be managed" according to the Department of Agriculture. The definition of invasive species is one "whose introduction causes economic or environmental harm OR harm to human health". I can't think of anything that causes more harm to human and environmental health than toxic pesticides and herbicides. We are a sick, non-thriving nation and pesticides aren't helping the problem. Kids are suing World Leaders because of the climate crisis we must give our kids HOPE. Pesticide-free is the way to be and helps our health, the earth, the pollinators and the future generations. I, and MANY MANY others demand you oppose BCPOS chemical spraying of open land.-Madison Cheshire MidwifeMadison@Gmail.com

145. I believe Boulder County should use all the tools available to control weeds. Mankind has imported- consciously or unconsciously- invasive weeds and grass that threaten to change entire ecosystems. They must be eradicated.
146. I may support the use of herbicides to control only List A weeds, but no others. I do not support helicopter spraying. Drone spraying guidelines must include cancellation due to weather and wind day of, which would confound accurate delivery to target areas. The health of downstream lands and waterways must not be compromised, necessitating short and long-term monitoring systems to insure there is no spill over outside of the targeted areas. Herbicide records should be kept indefinitely, and available to the public and researchers, to provide important information for long-term analysis.

147. there is no safe amount of glyphosate to spray around humans. we are ruining our environment when thinking this is acceptable. Please stop these poisons now. thank you. [https://childrenshealthdefense.org/defender/glyphosate-herbicides-brain-function-teens/?utm\\_source=luminate&utm\\_medium=email&utm\\_campaign=defender&utm\\_id=20231012](https://childrenshealthdefense.org/defender/glyphosate-herbicides-brain-function-teens/?utm_source=luminate&utm_medium=email&utm_campaign=defender&utm_id=20231012)
148. This is a really stupid survey. The answers to MOST of these questions really depend on exactly what the herbicide is. If it's Round Up, forget it. This was used for years with claims that it was safe and then it turned out to be carcinogenic. Surprise! Also many EPA "approved" herbicides have never really been tested. They were just grandfathered in many years ago. You should redo this survey and give people some actual, useful information. Not questions purposely designed with your pro-herbicide bias to influence the answers. I would support "certain" types of herbicides- even by drones- for massive weed concentrations of particularly noxious weeds in inaccessible areas. But would not give blanket approval of drone and helicopter spraying of anything and everything anywhere, which is what you've asked for here. Fifty feet from waterways is meaningless BTW considering the wind we have here.
149. Glyphosate has been banned in 22 countries and should NOT be used in addition to other chemicals - Boulder prides itself as being a environmental hot spot and this practice should not be used especially spraying chemicals from the air where they can drift into water and food crops.
150. Aerial sprays are an INSANE idea and should never be allowed to happen!!!!!!!!!!!!!!!!!!!!!!
151. Pesticides poison the earth pollinators and soil. Don't do it!
152. Many of us have allergies or serious reactions to these herbicides which can travel through the air to our homes, regardless how far it is sprayed
153. Your questions are poorly worded and make it difficult to demonstrate support for limited, judicious, ground-based applications of pre-approved pesticides. Having EPA approval is a baseline requirement. Instead please demonstrate what herbicides you will not use based on carcinogenicity, mutagenicity, endocrine disruption, etc. With all your working farms & ranches I don't understand why the county does not yet own a (small) herd of goats to tackle steep and inaccessible areas. They are only inaccessible to your spray tractors. Using a drone or helicopter is not an integrated approach if it is your only approach. The use of (cashmere) goats is a whole system approach to land management and the only approach that will actually destroy seed heads.
154. Herbicides are toxic to our health as well as the all of the other cosmic creatures in this planet. There are better ways to manicure our city. We are Boulder! Let's utilize safe and evolved ways of making our city beautiful!

## Boulder County Parks & Open Space

155. Last year Boulder County spent two days with helicopters dropping pesticide on Table Mountain (Longmont), which drifted into our horse stalls, pasture and the barn (Juniper Hill Ranch) creating hazardous conditions for all the animals and people.
156. Boulder County used helicopters to spend two days spraying the hillsides of Table Mountain without communicating to residents, many who have organic farms and ranches along Table Mountain. To say you will spray 50 feet from a waterway and 100 feet from a property line is a fallacy because first, it is debateable how far the helicpioter was from either and the pesticide drifted hundreds of feet into our barns, pastures, Tolgate Ditch and into our house (we had open windows because it was hot out and we didn't know what was going on with the helicopter flying back and forth and it caused my daughter to have an asthma attack). Furthermore, there was no efort to amend the soil or reseed the area, so the cheat grass is back. We have high winds out here and those winds carry weeds. Without addressing the root cause of the problem- poor soil and a alck of native grasses, pesticide use will and did fail. It contaminated Tolgate Ditch, forced our horse boarders and family indoors, contaminated our pastures and hay storage in the barns and led to a massive bee colony collapse at the organic farm down our road. Instead, Boulder County could have worked with landwoners in advance , communicating hte issue. We have literally tons of composted horse and sheep manure we give away for free to the general prublic and local farms. Working with the county , we could have donated the compostt to be applied to the hilside, following be reseeding in the spring. Those native seeds can outcomplete weeds, especially when the soil is healthy. Spraying pesticides on the mountain had a variety of negative impacts for the lands and people living alongside Table Mountain and if you come back out here, you can see the cheat grass is just as vibrant as ever.
157. As a professional hydrologist, I am very concerned about the impacts to surface waters from the runoff of applied herbicides. Herbicides can persist in the environment and end up in streams and lakes, resulting in unintended consequences to those important habitats. I recommend the use of herbicides only as a last resort when all other management techniques have been shown to not be effective.
158. Chemicals are killing the planet and all life on it
159. Using glyosate / Roundup and other highly toxic poisons kill wildlife, pets and people. All other options need to be exhausted before any such use is warranted and there may never be a safe way to use them.
160. There is no need to use herbicides other than it is the most cost-effective solution to control many particular environments. We have the money. We can afford to pave the way, set the example, utilize non-toxic methodologies to care for these lands. Goats- look at the success of Durangoats and other temporary animal grazing projects. There are way too many chemicals in our habitat. Please refuse their future use, despite the promise they hold as a "solution"- Think long-term, low impact, natural, safe- be creative. Too expensive? Reach out to citizens and see if it's worth the extra money. Then tax or crowd-fund to get there. Please prioritize a regenerative system of weed management.

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161. Dicamba should be State outlawed! It is too volatile and should Never be used in any situation. Glyphosate could maybe be used on Canada thistle etc.
162. I think aerial imaging and monitoring via these methods with on ground volunteers and/or workers trained to identify classes of weeds and what is able to coexist with native weeds and plants and treat them on the ground sans herbicides is most effective.
163. Boulder County, I am completely opposed to pesticide use on public land! Please remember that state law does not mandate the use of pesticides for ANY weed, it just mandates varying levels of management, which does not have to include pesticides. There are natural ways to protect our environment.
164. Though these herbicides are approved by the EPA, they pose too great a threat to our waterways and ecosystems to be applying them as liberally as Boulder County has in the past. Herbicides should be used only for targeted, hand-application on specific plants so as not to disrupt the ecosystem. Boulder County needs to apply a more rigorous standard for choosing herbicides, since some, particularly 2-4D and dicamba, have widespread ecosystem effects that can damage non-target plants and persist in the watershed. Boulder County also needs to conduct water monitoring to assess the downstream impacts on non-target organisms.
165. EPA freely admits that ingredients labeled as “inactive” and “inert” have never been tested and cannot be assumed to be benign. See: <https://www.theguardian.com/environment/2023/oct/09/epa-cfs-toxic-inactive-ingredients-pesticides>
166. Please use methods that do not threaten organic farming, health and welfare of county residents.
167. As a resident of Boulder County I strongly urge Boulder County to abandon any plans to increase chemical use and instead to implement plans to eliminate any and all chemical use immediately. You are trying to control nature. Instead focus on how you can work with nature. There are natural practices that have been proven to get rid of “weeds” in the long term. Chemical application is a short-term solution with dire consequences. Glyphosate is on your list of chemicals and that has been proven to cause cancer in humans and has had billions of dollars in settlements because it literally causes cancer. All chemical applications have been scientifically proven to have dire negative consequences. This plan blatantly ignores modern science and shows that Boulder County does not care about the health of its residents one iota. Chemical applications run off into waterways and have caused dead zones in other parts of the country and world – where no life can survive. Residents of this beautiful county swim in the water, drink the water, eat the food that’s grown from the soil and we do not want any of it to be contaminated with any chemicals at all. Also, chemical applications kill the soil. Using aerial applications is the stupidest idea I have ever heard Boulder County propose. With aerial applications you will end up spraying people and animals, no matter how careful you try and be that will happen. And when that happens you will have a gigantic lawsuit on your hands. By doing any chemical application you will run into massive lawsuits, which also shows you don’t

care about the money that Boulder County gets from its residents. On the Office of Sustainability, Climate Action, and Resilience (OSCAR) website which is part of the Boulder County website, it states, ““Our mission is to advance policies and programs that conserve resources, protect the environment, and safeguard our climate in order to build a sustainable, just, and resilient community.” This plan is in direct conflict with that statement. Which proves that Boulder County is all about talk and not action. Actions speak much louder than words so when you propose a plan to spray chemicals that will kill residents and bankrupt the county from lawsuits and kill the soil and pollute the waterways and harm animals and ignore actual science, it shows that Boulder County does not care about its residents at all. Plus, Boulder County obviously doesn’t want anyone to find out about this plan with a very short comment period that Boulder County does not advertise anywhere. For a plan of this magnitude Boulder County should be going out of its way to make sure that all residents are aware of this proposed plan and actively tell people they want feedback. We live on stolen land; we all owe it to the indigenous people that the land was stolen from the be good stewards of the land. That would be working with nature to solve this problem, not trying to control it with chemicals, which has dire consequences. For the love of God, propose and implement a plan that actually protects the land, protects the residents, protects the soil, and protects the water. That is the only way forward. Otherwise, we are all doomed due to the incompetence of Boulder County. I am absolutely appalled by the plan, I do not support it one bit and I am furious at Boulder County for even proposing it. Protect your residents and eliminate all chemical use yesterday.

168. I am extremely disappointed that Boulder county is still using these toxic products, and horrified at the thought of Ariel spraying. We are better than that, and should be leading the way in healthier practices for people, animals, soil and water.
169. In the past, there have been adverse effects to bee colonies due to aerial spraying in Boulder County as well as human health. Spraying poison from the air is just a bad idea.
170. Until the county’s open space leadership demonstrates a sincere openness to hearing alternative views, our family is worried about all proposed policies.
171. All mechanical means should be employed, or grazing by goats, along with mowing frequently to deplete nutrition to the roots, and in wilderness, those who hike can pull the weeds if a dumpster is provided at the trail head.
172. Plants that are identified as weeds are more of a symptom to a larger issue of ecosystem health than they are an issue to be waged war upon in and of themselves. Using agents to destroy life of one species always creates a further imbalance in the larger system. Chemical land management policies are short term solutions that create longer term problems. The big picture, systems thinking approach whether it be in human health, plant biology, ecosystems or community health can provide a more comprehensive lens to better understand that long term solutions do not include poisoning of one organism but rather observing

how caring for the health of all beings supports a natural balance. With the extreme rise in chronic disease in our child and adult populations in addition to the crisis of pollinators, wildlife and the species that we humans must steward the care for, it is imperative that we step away from our war mentality and into a truly holistic lens on how to cultivate health for all beings.

173. The herbicides and pesticides gets into our air and waterways and the runoff gets into our gardens and our bodies down here in the valley. There are much safer and equally as effective ways to treat the problem weeds.
174. Natural material like vinegar can be used instead of herbicides, removal and mowing are also beneficial to weed reduction
175. EPA approval is not an indication of “safe” for waterways, farms, or native animals. The county has long overvalued the view, without doing what it takes to effectively manage our open space. Management of grazing animals is the way to keep weed pressure down, increase biodiversity and naturally fertilize our land.
176. Please find the courage to oppose new technologies that contribute to chemical spraying. Also, excluding the human health dimensions of chemical spraying from the survey and its attendant literature, while highlighting the plans aim to protect ecological diversity, is deliberately misleading; it excludes the alarming, and scientifically-backed, concerns regarding chemical spraying, while suggesting that the decision in question is solely about protecting plant and animal diversity. Such rhetorical slight-of-hand is shameful, but sadly all too familiar.
177. There are a significant number of studies showing herbicides adversely impact the microbiome of human and non-human species, and that there is insufficient research into the adverse impacts to physical and mental health associated with a deteriorating microbiome. There are entire books on this topic but two studies that show up with a quick google search are: <https://www.nature.com/articles/s41396-023-01450-9>  
<https://www.sciencedirect.com/science/article/pii/S0169534722002294#:~:text=Herbicide%2Daltered%20microbiome%20affects%20plant,for%20both%20microbes%20and%20hosts>.
178. Citizen weeders would happily volunteer to eradicate noxious weeds.
179. There is some mention of hand pulling as part of the management strategy. I’m somewhat skeptical that this method will be embraced by enough stalwarts to be an effective part of a management plan.
180. Your survey is profoundly flawed and biased. The questions you ask are designed to create division between different groups instead of exploring the subtlety of ecological management questions. I am an environmental science student at Prescott College, seeking a career in ecology. As an author in a prepublication for a paper on invasive plant management in Ecology and Evolution, I understand that the dichotomies presented in this survey, such as agreeing or disagreeing with integrated weed management or



believing that weeds do or don't impact biodiversity, are entirely bogus extremes that overlook management realities. The issue this survey is supposed to address is that the Boulder County weed management department is obsessed with using herbicides, including some with dubious impacts on ecosystem health, on weeds scientifically demonstrated to cause limited harm to the ecosystem (for instance, cheatgrass). Invasive weeds, obviously, pose a significant threat to biodiversity. However, the supposedly "targeted" herbicides used by Boulder County also have massive negative impacts on biodiversity (as demonstrated in tests on healthy wild-land ecosystems in the northern Rockies), including annual native plants and aquatic life. Cheatgrass, the main target of many of these treatments, is only a minor threat to ecosystem health in Boulder County because of the climatic and environmental conditions in the area, making Boulder County's herbicide treatments a net negative for biodiversity. Your survey intentionally made it impossible for me, as an informed citizen, to represent my opinions by forcing all of my views, knowledge, and understanding into a format designed for the Boulder County weed department to dismiss all the residents' not-entirely-pro-pesticide opinions as being outlandish and unrealistic. Your behavior, both in your public feedback process and your ecological management of weeds, is utterly unacceptable from a management agency. I look forward to voting for county commissioners who overturn the agencies responsible for both of these atrocities and institute a department that is legitimately interested in managing ecosystem health in Boulder County as opposed to catering to acreage treatment objectives for pesticide studies.

181. "Weeds" is a pejorative term. It's not a science based/ecological view point. It's not even a word about policy. The semantics may not seem like a big deal, but giving into pejorative terms reflect a serious issue with prioritizing our feelings over the safety and longevity of our land.
182. It's important to support local farmers, gardeners and ranchers who work hard day in and day out to supply our food and earn their livings. It's morally wrong to spray ANYTHING that interferes with our food and water. Please don't do it!
183. I have never seen anyone out pulling weeds. I have seen people spraying. I would think this is a great opportunity for someone that needs a job: pulling noxious weeds. I managed a farm for 10 years organically. I know it can be done.
184. I think that use of herbicides should be kept to the bare minimum due to potential effects on non-targeted species and water sources. I do NOT support aerial spraying. But I understand that there will be cases where herbicide use may be the best option for particular, targeted situations. But this should be the last resort, not the primary approach.
185. As someone who studies air borne aerosols, there is no "safe" method for aerial spraying due to winds and other factors. I strongly recommend Boulder not perform any aerial spraying.
186. While best intentions can be had with aerial spraying, it is impossible to say that chemical applications will

not impact areas outside of the target.

187. I support natural and biological weed suppression whenever possible. Love the idea of goats to eat weeds whenever and wherever possible to suppress weeds.
188. There are better approaches to managing weeds in open space WITHOUT use of pesticides- please protect our community health and air quality by implementing weed management protocols without pesticides.
189. Stop poisoning our environment
190. Please no herbicides! There are better ways.
191. I am very concerned about the extensive use of herbicides by the county — it goes well beyond efforts to control noxious weeds on the A and B lists. I ask for a moratorium on all pesticide use until BCPOS establishes a more science-based inclusive public process that fully incorporates perspectives from ecologists and other scientists, local nonprofits, community leaders and staff.
192. It is time for more innovative solutions. Plenty of people in this county care enough to come and help without needing to apply chemicals that get into our waters and affect the health and safety of people on our lands. This could be turned into a beautiful lesson in ecology and natural land management that could be the foundation of change in practices across the state and even nation. Let Boulder County stick with high values on health and innovative solutions.
193. How is drift controlled? What do open space farmers who are using non-herbicide/non-pesticide approaches to sustainable/regenerative farming have to say? Do they have a say?
194. I oppose the use of herbicides. These chemicals get into the air and run off getting into the ground water. I am a pediatric nurse practitioner and it is my job and duty to protect the health of our children. These chemicals are harmful and affect the areas where children play, hike, live and also our food sources we all consume. Please use alternative methods such as grazing.
195. Drift concerns are high and ecological impacts are not acceptable
196. Please do not use herbicide. There are better ways. Please consult expert farmers who have been doing this without herbicide for years.
197. The use of herbicides in weed management has too many significant risks that outweigh any potential benefit. They have the potential to contaminate ground water sources, kill off non-targeted plants, animals, and insects. Because there are many non-chemical weed management options available, I believe that all options should be exhausted before considering the use of herbicides. I personally have spent many

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volunteer hours pulling invasive weeds across Boulder County and will gladly continue to do it.

198. Please listen to scientists like Mark Guttridge at Ollin Farms on the harms created by herbicides and the effective alternatives he has used on public spaces for Boulder County.
199. Spraying from a helicopter effects humans. Using a drone pinpoints areas and also allows for people to be nowhere near when these treatments are happening.
200. Please prioritize other methods of weed management, including addressing the root causes. Herbicides should never be applied, especially from the air, with so many known and unknown effects on wildlife, water, and people. Stop poisoning Boulder County.
201. Alternatives to herbicides are needed to preserve the health of the environment including water, pollinators, agriculture.
202. There are other methods that will not pollute!!
203. Please partner w/local farms and ranches to use natural, organic means w/grazing, mowing, controlled burns, community weeding days, etc.
204. You have got to be kidding, right? To think aerial spraying of any kind won't contaminate water, and wildlife and have unintended consequences.
205. Bring on the grazers, mow away, hire the homeless to weed, leave the poison out of Boulder!
206. Robust, peer reviewed research suggests that EPA standards are not adequate to protect people and planet from harmful effects of synthetic herbicides, specifically 2,4-D; glyphosate; and Dicamba. Applying these and other synthetic herbicides via drone and helicopters, even in accordance with EPA recommendations, threatens the long term well being of Boulder County's ecosystems, the health of its people, and the strength of our agricultural economies.
207. Regardless of safety labels and following directions, aerial spraying of chemicals is NOT safe and should not be allowed on open space. People may be minimally protected by buffers but animals, pollinators, other plants, and soil are not protected. We need to have more focus on regeneration and soil health because that is how we will have longterm success. It may take more time and a different kind of effort but the health of future generations will depend on what we do and allow now.
208. Let's come up with as many creative alternatives to herbicides possible please!
209. At one time in my life, I was licensed By the Colorado Dept of Agriculture to spray pesticides. After many years in the business and seeing the good and bad about pesticide applications, it's my opinion that our

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planet is better managed naturally. All pesticides are dangerous. After a spray, they are invisible but ever so present. They kill birds and so many other creatures. They cause cancer in dogs and humans and are just plain nasty. Gosh.... Boulder County USED to be environmentally conscious but now, it seems like no one cares about mother earth. God bless us all if you keep spraying to make the job easier.

210. Weed management should not use any chemical agents at all, even if within legal regulations as set by the state or federal level.

211. Please maximize use of alternatives to herbicides, and especially avoid widespread application, such as a drone or helicopter. Please incentivize more sustainable practices, such as using goats or other livestock to control weeds.

212. A pilot program using regenerative practices for targeted grazing of weeds and using weed management money is needed. It's time for the County to be paying regenerative land managers to manage weeds through targeted, strategically timed grazing. Monitoring of spray sites and downstream water bodies for non-target impacts (insects, aquatic organisms, water, soil, and drift) is absolutely essential and required. The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms. This is also essential. I request that Boulder County post every pesticide application going back at least five years and not to destroy the historical data, for use in future environmental toxicity studies.

213. Aerial drift could exceed 1/8mile under certain circumstances depending on elevation. The plan needs specifics on sites, prioritized sites, mapping of list noxious historical data, progress mapping

214. I agree that the weeds need to be identified and removed, and that targeted, short term use of herbicides may be acceptable: using them for 1-3 years to bring a population of weeds down, then other methods to maintain the suppression. I understand coordinating volunteers to pull weeds is time consuming and potentially unreliable, and other methods may be costly, but the toxicity of the herbicides is typically understated by the manufactures and the EPA. Herbicides should be avoided whenever possible.

215. I had two friends sprayed while they were walking, and they became very ill. Doga are also coming in contact with these toxic sprays as well as all the wildlife. Try making some new jobs for people / homeless people.

216. There are other ways. For the long safety of our community, Herbicides must be used in very targeted situations when there is NO other option. Their negative impact far exceeds their benefit and we do NOT understand how they impact the long term health of our community. Utilize the brilliant minds in BOCO who have dedicated themselves to preservation of our natural environment and community health and safety. Form an advisory board, a think tank. It's time??

217. It's appalling that our health-focused city continues to spray poison on our precious lands impacting both the soils, water and eventually human health. So sad.
218. Aerial spraying can harm animals in the area. I have seen the harmful and deadly effect of herbicides on different animals including mammals, vertebrates and amphibians.
219. Aerial spray can not be totally contained and will harm biological diversity, as well as cause respiratory problems for sensitive individuals, including children and seniors. Aerial spraying must be banned!
220. The county should also consider the use of grazing as the City of Louisville has been doing with good success at controlling unwanted plants and for controlling for wildfire risk. Human and animal labor, use of fire, tilling, and other time-tested methods are preferred over the use of toxic herbicides. Take a look at how things were done before WWII and the creation of the plethora of chemical humans used then to control "weeds."
221. Please reconsider mowing practices to allow more grass to grow and provide a thick layer to deter weeds. Tall grass also helps to keep the ground cooler. Not every park has to have grass mowed around every tree. Supporting the growth of natural grass and native plants is the best practice
222. Please place a moratorium on herbicide and pesticide use immediately . The biodiversity of the planet needs us to stop using harmful chemical in our environment . Just because the EPA approves something doesn't make it truly safe . This has been proven time and time again State law requires Boulder County to eliminate all List A weeds and to have a "management plan to stop the spread" of List B species—although nowhere does the state mandate that this need be accomplished with herbicides. For List C weeds, the county is required to have programs to develop "more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species." There are no legal requirements for the management of species on the Watch List. Nowhere does state law specify that herbicides must be used to accomplish any of these objectives, although in some cases some people would say their use is necessary. The truth is, our County has a great deal of both responsibility and flexibility in the control methods it chooses. Boulder can do better and should make more eco friendly decisions using weed management money, for targeted grazing of weeds using regenerative practices. It's time for the County to be paying regenerative land managers to manage weeds through targeted, strategically timed grazing. I ask boulder to implement a more stringent process for approving individual pesticides for use on public lands. As a point of reference, all 31 of the products listed in use by Boulder County failed the City of Boulder's more rigorous pesticide approval process, with 2 of the 31 being approved for certain conditions and 1 for special use cases only. This specific point shows that many are not truly safe I would also like to understand how the use of pesticides fits within Boulder Counties soil health initiatives. It would seem to me that pesticide applications could significantly interfere with soil health

efforts being conducted on Open Space lands. And what about the water and other organism affected by use of chemicals ? Are you truly monitoring spray sites and downstream water bodies for non-target impacts (insects, aquatic organisms, water, soil, and drift). The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms. What , if any, water testing has Boulder County done – at spray sites, along impacted ditches, in surface water, in groundwater. I believe the county should pay for Open Space lease-holders and other downstream neighbors to have their water tested for pesticide impacts

223. Please don't pollute our open spaces with chemicals!

224. Arial spraying is irresponsible and has NO place in Boulder County

225. Get volunteer crews or pay people to pull the weeds. Bought my house in Nederland mountains in 1993 & pulled early in spring Mullen & Canadian thistle weeds yearly & now have very few each year & never used a herbicide!

226. There are native creature- including bugs and bees that would be affected in areas away from people. They matter too in and of themselves as well as for the health of the native ecosystem

227. Use of pesticides, including aerial spraying of herbicides, on public lands should be a tool of last resort. BCPOS should seriously consider using all other methods of weed control, including grazing, before using pesticides and herbicides. BCPOS should develop and implement a stringent process for approving individual pesticides for use on public lands. BCPOS should identify and address the root cause of noxious weeds, and then diligently implement the BCPOS decision model for early detection and rapid response. BCPOS should conduct monitoring of spray sites and downstream water bodies, including ditches and groundwater, to determine short and long term environmental impacts on water quality, soil health and non-target organisms, including insects and aquatic organisms. BCPOS should establish a robust monitoring database for use in future environmental toxicity studies. BCPOS should ensure that the weed management plan aligns with all BCPOS public health and environmental protection objectives, and related management plans, including soil health initiatives.

228. Weed management needs to be considered with concern for the health of the water, air, soil and all living beings. Herbicides are not a sustainable or long-term solution.

229. The current efforts to control weeds in Boulder County do not seem to be sincere. Too often patches of weeds are left to bloom and seed before any noticeable mowing is undertaken. Much of the open space areas used for grass hay fields are severely neglected or mismanaged. I think ag leases should be managed better. Some of the cuurent field mamagment is shameful.

230. You would benefit by outlining your eradication process and how you evaluate an ongoing eradication

program. Outside eradication, you may want to include evaluation of least negative impact. With respect to herbicides, perhaps use lowest animal toxicity product during first treatment cycle, switching to others as needed. Also, your plan would benefit from explicit data collected to evaluate if your tactics are helping achieve your goals.

231. Are the buffers large enough to ensure human safety and aquatic health?

232. Considering the drastic decline in insect species, I believe reliance on Herbicide applications must be eliminated in all cases possible, and NEVER used except as a very last resort. There's too much potential for pollinator (and other arthropod) extreme harm

233. why is there zero effort to recruit volunteer hand weeders? County should train volunteers to remove noxious weeds. Seasonal staff should be hired to remove weeds mechanically. I would be happy to pay more tax so that govt would STOP spraying open space with herbicides!

234. This is a great plan with identification of problem and realistic solutions. The case studies show that the use of herbicides in a limited, controlled way, is very effective. It appears that there was great effort to select herbicides that have relatively small toxicity concerns for people and ecosystem. You could provide more support for this by conducting studies of occurrence of the herbicides in streams and soils after their use to show that they are not a potential concern for other areas or later times.

235. Some of the listed herbicides are known to be toxic and harmful to wildlife. I oppose the use of those herbicides.

236. After working with a county weed department (where I was using biocontrol agents) in Utah, I am familiar with what the pesticide labels say and the reality of how technicians actually apply those chemicals. Also, I find it hard to believe that any reasonable person would think a helicopter with rotor wash, ship movement, and ambient winds could apply a pesticide within the specified limits stated in your questionnaire.

237. There is now laser technology integrated with autonomous transport that can identify and delete weeds using said lasers DO THAT! With the amount of freakin' aerospace tech around you'd think someone would be all over this!!!

238. I find it absolutely crazy that some folks are so opposed to herbicides. The herbicides used by Boulder County are remarkably safe and are extremely cost effective. Compared to many other activities in which we engage (consuming EtOH, grilling food, breathing (oxygen is a horribly dangerous compound), etc.), herbicide use is at most a negligible risk. I am reasonably aware of the biological risks of these compounds as I am a Professor of Biochemistry at CU.

239. We need a pilot program, using weed management money, for targeted grazing of weeds using



regenerative practices. It's about time for Boulder County to be paying regenerative land managers to manage weeds through targeted, strategically timed grazing! Get with it Boulder and be a leader in reducing the impact of chemicals and turning to proven natural methods. You have partners here to help!!

240. This is RIDICULOUS! Why not hire some GOATS to manage those weeds! Herbicides are simply NOT an option – given the state of our poor Mother Earth and the damage we are doing to her! We need to learn to GIVE BACK to the planet and STOP TAKING away from the planet. Simply put: THERE IS NO PLANET B!

241. Weeds should be managed through mechanical, grazing, and biological methods. Targeted use of herbicides should be used only as a last resort. Aerial spray of herbicide should never happen on our public lands, due to their negative environmental and health effects. There should be a moratorium on all herbicide use until Boulder County establishes a more science-based, inclusive public process that fully incorporates perspectives from ecologists and other scientists, local nonprofits, community leaders, and staff. The County should also start a pilot program, paying regenerative land managers to manage weeds through targeted, strategically timed grazing, and study the effectiveness of these methods.

242. The tradeoff in using herbicides is just not worth it. Bring goats onto as many areas as possible to control weeds and use all the alternative methods for weed control that don't entail the use of herbicides.

243. Do what needs to be done! So many coastal transplants have no idea how life works in Colorado.

244. Poisons harm our citizens and the local ecosystem diminishing the resiliency of the ecosystem on adapting to the changing environment. Monsanto is paying out billions because glyphosate causes cancer.

245. I would like to consider broader buffers for aerial spraying, especially along waterways.

246. Weed management is very important, but also are the pollinators. Care must be taken with each application.

247. Herbicides are far more dangerous than weeds.

248. Herbicides contribute to the death of our ecosystem. It not only kills the targeted plants but many insects and animals in that area. I strongly oppose the use of herbicides in any manor.

249. We should use goats and sheep not chemicals.

250. Prescribed burning has always been a tool to Native American practices and could be used on weeds. But invasive species need to be extracted from many areas in the US.

251. Permaculture practices should be a priority to manage invasive weeds

252. Invasive weeds must be controlled in order to protect native wildlife and vegetation. Not controlling the invasive weeds ensures the demise of native species.
253. As someone who's worked in IPM, completely removing herbicides because of public fear/ misunderstanding about how they are used and what they do would make weed management in open space almost impossible, and significantly more expensive. I'm not sure why residents have a say regarding the use of pesticides, but I can't imagine weeds in open space could be controlled without them. Mechanical weed removal and biological control have applications, but at the scale of the city's open space it's infeasible to think you could remove chemical weed control and successfully counterbalance invasive species removal with the other two groups of methods. Directing more attention to increasing public awareness of how herbicides work and what they do would be a better use of time and money. Please continue to use herbicide and continue doing what you do to keep boulder open space as nice as it is.
254. I am very concerned about the extensive use of herbicides by the county — it goes well beyond efforts to control noxious weeds on the A and B lists. The City of Boulder has better policies around herbicide use and I hope the County moves in that direction. The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms and needs to. Research suggests commonly-used herbicide is harmful to adolescent brain function (<https://medicalxpress.com/news/2023-10-commonly-used-herbicide-adolescent-brain-function.html>). I request a moratorium on all pesticide use until BCPOS establishes a more science-based inclusive public process that fully incorporates perspectives from ecologists and other scientists, local nonprofits, community leaders and staff. Thank you.
255. I have been a professional gardener in Boulder County for over 30 years. It isn't acceptable in any way to use herbicides in any form to manage weeds. Especially in the foothills or mountain open spaces. The more humans intervene in the natural course of nature, the more resistant things become. Not to mention the toxic results to our environment. The natural world adapts to change. There is no safe herbicides .
256. The use of herbicides, which are known to be toxic to humans as well as pollinators, should be avoided at all costs!!
257. Please consider our surface and groundwater. Spraying "50ft from water"- where do you think this will go when it rains? This is more about convenience- we need a better plan. Boulder needs to do better.
258. Herbicides affect honeybees as they are visiting flowering plants. Aerial spraying in indiscriminate blanket application of harmful agents
259. As many farms and single-family households do, please use non-toxic methods to remove weeds. Community efforts with removal could be an option too.
260. Herbicides, even though deemed harmless to pollinators, still affects their food sources and habitats.

261. First of all, the climate is changing. What is local and what is invasive is a moving target. Weed mitigation in a changing climate is wasted time in my opinion, though I do work manually to remove invasive species from my gardens manually. If we are going to try to fight weeds, we must do the hard work of manually removal without chemicals. My church does help with weed removal and seed collection on Open Space. I work with a non-profit, Earth's Table Donation Gardens that grew 26,000 jobs of vegetables for food pantries in Boulder/Broomfield COs last year. We use regenerative methods of growing and absolutely no herbicides or pesticides with great success. I think the negative effects of herbicide and pesticide use on insect and animal life far out weigh and positive benefit of weed elimination with chemicals. This doesn't even touch on the negative effects chemicals can have on human populations. It's crazy that 50 years after the book "Silent Spring" that we are still using these dangerous chemicals.
262. Weed management at the county level directly affects local landowners. Limiting an effective option begins an avalanche of negative economical and environmental effects that will be a severe problem decades later; Much like the disastrous effects of Western policies surrounding forest fuels and wildfire.
263. In the aftermath of the Masrhall Fire our property has been overwhelmed by noxious weeds- we strongly support BoCo's efforts to control weeds on a landscape scale, using what ever tools are effective.
264. Please do not spray any chemicals on our ecosystems!
265. Keep the poisons out of our watershed. Quit killing bugs. Get on your tractors and mow.
266. The Draft Weed Management Plan from Boulder County raises significant concerns, particularly its endorsement of herbicides such as indaziflam. From an economic standpoint, the use of these chemicals poses a risk not just to environmental sustainability but also to the long-term viability of local industries, including agriculture and tourism. The science supporting the efficacy of these herbicides in fire risk mitigation is inconclusive at best, yet their detrimental impact on soil health and carbon sequestration is well-documented. I strongly advocate for an immediate moratorium on synthetic herbicide applications until a comprehensive, science-based strategy—developed through an inclusive public consultation process—is in place. Allocating resources to pilot programs that employ regenerative land management techniques, such as targeted grazing, could serve as a more sustainable and economically beneficial alternative to chemical weed control. Rigorous monitoring protocols should also be implemented to assess the impact on water quality and non-target ecosystems, thereby safeguarding both environmental and economic assets. Furthermore, it's imperative to consider the social equity dimensions of this issue. Marginalized communities are disproportionately affected by environmental degradation, which in turn has economic repercussions. These communities often have less access to healthcare and are more dependent on local ecosystems, making them particularly vulnerable to the adverse effects of herbicides. In conclusion, policy decisions in this area should be guided by independent, unbiased research and aligned with existing municipal regulations. The public sentiment is clear: there is a strong desire to move away from harmful

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chemicals. As stewards of both the land and the local economy, it is our responsibility to heed this call.

267. I have first hand seen and been impacted by the negative effects of herbicides on both humans and our planet. 100% opposed to overhead sprays via drone and helicopter. I can somewhat empathize with the need for direct targeted backpack sprays on an as-needed basis but this should be LAST RESORT, not first line of defense.
268. All tools must be considered and used to be effective in controlling invasive species and to slow or stop ecosystem decline. Uneducated, misguided paranoid views about the key tools available and the absolutely inaccurate assessment that invasive species do not pose an environmental and human health risk are dangerous and pose as big of risk to the ecosystem as the invasive species. The staff at Boulder County are experts with an extensive knowledge of how to execute an integrated pest management strategy and how to preserve and restore the lands they are tasked with protecting.
269. These are lands bought with my tax money. There are other ways. No herbicides!
270. I am opposed to herbicides...there are other safer methods to use...goats, for example
271. Toxic chemicals are not the answer. Please consider alternate methods. Goats, volunteer corps, native plantings and creative partnerships.
272. We relocated to Boulder because of its respect for Nature and its clean water and environment. I strongly oppose the use of herbicides
273. Use our greatest resource, humans – recruit volunteers and get people educated to remove weeds when we see them. Manual removal is best as it removes seeds, roots, etc and does not introduce poisons and toxins into our already stressed environment.
274. EPA guidelines on herbicides are inadequate, outdated and tainted by lobbyists. For instance Glyphosate has been found to be a strong neurotoxin that interferes with our entire nervous system. One published paper outlines these effects: Toxic Effects of Glyphosate on the Nervous System: A Systematic Review <https://www.ncbi.nlm.nih.gov> Here is an excerpt : Although most of studies in humans mainly describe the consequences of glyphosate poisoning after suicide attempts, it appears that occupational or chronic exposure to this pesticide (via inhalation and dermal routes) may also cause neurotoxic effects. In a study by Fuhrmann et al. [45], the authors describe that glyphosate exposure has been associated with the development of visual memory impairment in Ugandan smallholder farmers. These lands belong to the natural world and those of us who chose to protect them. Please don't take any chances with the lives of applicators or our precious natural ecosystem. Boulder County can do better.
275. My masters degree is in fluid mechanics and there is no way to effectively prevent sprays or manual

application of chemicals from entering our water supply, and there is no need to use chemicals- i don't understand why such an environmentally conscious community would condone using any chemicals on our land. Our children and Wildlife should not have to suffer the impacts of using chemicals. There are many more humane and sustainable ways of weed management and mitigation that do not involve chemicals. There are many local permaculture practitioners who would gladly help generate a more humane, wholesome, sustainable and natural approach to weed mitigation that does not involve using chemicals.

276. Please place a moratorium on herbicide use until a process is established that includes ecologists and scientists knowledgeable about the short and long term consequences of herbicide use, non profits, community members and leaders and staff. We should be adopting practices that enable regeneration of soil and eco-systems and that protect human health.
277. Herbicides are not as safe as often claimed. More effort should be spent on reducing potential impacts to wildlife and humans from sparying.
278. I'm concerned about at-risk pollinators.
279. This threatens pollinators, human health and safety, and wildlife far too greatly. I strongly disagree with these herbicides being introduced into our environment and watershed.
280. Weed management with targeted applications of the least dangerous herbicides can be situationally acceptable. Aerial spraying is the opposite. It is broad scale and not targeted enough to justify its use. No aerial spraying.
281. We know the long term effects of using glyphosate and round up. No no no!
282. Way too close to urban areas. A small wind would make things a respiratory hazard. Pesticides should really only be a last resort for extreme risk of threat to biodiversity. Most things can be managed more easily by handpulling. Weeds see opportunity and risk mitigation is better than scorched earth with the risk of serious human health effects around pesticide use
283. Targeting infestations with effective herbicides and other methods will provide the best benefit with the least negative effects to the ecosystem.
284. Nature doesn't understand a 660 foot boundary. Even on a day of calm/little wind, aerial sprays are hard to control. I live in rural Boulder County and my 3 year old plays outside, often barefoot daily. I do not want to live in a County that uses weed management tactics that mean I cannot continue to give him these opportunities to connect with nature on the lands we live on. As well, how will downstream impacts be monitored? This new plan does not list any protocols for monitoring environmental impacts downstream for insects, aquatic organisms, water, soil, or other living things- but needs to.

285. Bees are attracted to common weeds and help pollinate other plant life that sustains other wildlife and should be protected
286. Chemical exposure is horrific for all it touches, children, adults, pets, animals, insects, birds, our water supply and the soil. Corporations that push this agenda is purely financial and it is at the greater costs of health and our environment. Why must we do this? For fire prevention? Have planned grazing, it will increase the oxidation and root depth in the soil making it more resistant to fires.
287. There is no need to control weeds with herbicides. Please refer to Beyond Pesticides Organic land management page
288. Please discontinue the use of Glyphosate on County owned lands. Thanks for your consideration of my input on this new plan!
289. Please keep all the options open to use all available tools
290. Please ensure this plan is updated annually with an opportunity for public comment provided no less than every 5 years when a full Update must be conducted by.
291. Boulder County needs ecological health management not weed management. Therefore the first step should be to eliminate the current Weed Management Department (the one responsible for developing the current draft of the integrated weed management plan) and replace it with a new department for ecological health management, staffed by individuals who actually have competence in ecological health management. Obviously, such a transition would involve immediately stopping all use of herbicides, as herbicides contribute to the degradation of the health of the ecosystem. Despite sometimes reducing or eliminating targeted weeds, herbicides introduce poisons into the environment, poisons that are detrimental to the ecology, the health of the ecosystem, and human health. The Department that wrote the current draft of the integrated weed management plan clearly does not understand this and intends to further damage the Boulder County ecosystem by pumping even more poisons into the environment. The citizens of Boulder County deserve better. Eliminate the weed management department now and immediately stop any further herbicides in Boulder County. Let the newly created Ecological Health Management Department take responsibility for managing weeds by cultivating overall ecosystem health. Such cultivation of ecological health will lead to the reduction of weeds, which are a symptom of ecological ill-health, not the cause of such ill-health.
292. The Integrated Weed Management Plan dismisses all the alternative resources to using herbicides to control weeds that were delivered by scientists and residents over the last two years. It completely ignores the values of Boulder County residents, who want BCPOS to stop using herbicides on Boulder County Open Space natural lands, as well as the specific needs of the local ecosystem and the climate crisis. Boulder County Open Space Weed Department wastes the taxpayers' time and money. The Department delays the

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progress we need to address our climate crisis with alternatives to pesticides. Boulder County does not need a Weed Management Department anymore. Boulder County needs an Ecosystem Health Management Department that holistically restores and manages ecosystem health.

293. There is so little education on the long term impacts of herbicides. It should be enough that Roundup is in so many lawsuits. But Boulder is a haven (or was, not anymore) for so many chemically sensitive/intolerant people and it's chemical trespass because we can't escape the drift especially, which is a very real thing. USE BUGS from CDA- they work great (I use them and it's sustainable- eradicated weeds LONG TERM instead of creating weeds that become tolerant to herbicides thus requiring more, stronger, etc). Also organize weed pulls, I did and people will turn out if properly marketed. Get teens from schools to work for cheap mowing and pulling. They need work! It's insane to me that Boulder is spraying so much- I legitimately get sick when I come upon an area that has been sprayed- even driving by with the window open- and I'm far from the only one. The problem with the environment and the climate change issues in world today is exactly this kind of short sighted thinking. Herbicides and pesticides are not safe- and it is NOT the dose that makes the poison as people used to think. Science is in and even a small amount can turn a gene on that can ruin lives - it happened to me. Please consider all of us with disabilities, and preventing others from getting sick. There are other ways to mitigate, the bugs work great.

294. use livestock to eat weeds!

295. I don't want neonics used because they kill pollinators.

296. Why would anyone destroy records no matter how old which would serve scientific research?

297. I am shocked that this is even a conversation. Glyphosate causes cancer and dumping chemicals all over our open space when there are certainly other measures that can be taken is extremely upsetting to me. There is no protocol on the effects of this downstream for wildlife, water, soil health, or other ecological systems. Boulder is a mecca for environmental awareness and health. I am shocked that this is something the County would allow and encourage. Please take the environment and the people's health into consideration. Please stop the mass spraying of chemicals that kill biodiversity and cause cancer.

298. NO herbicides! They are more harmful than any invasive plant could ever be.

299. Do not use any chemicals in aerial spraying

300. Regardless if aerial spraying is done 660 feet from residential boundaries as this is saying, the effects of the spray will still spread and effect people within those boundaries not to mention negatively affects dying bee populations, wildlife, people, and other plants in the area. NO AERIAL SPRAYING!!!! I live in Lyons and last time this happened I had a migraine daily for almost a month after the spraying was complete. Listen to Indigenous voices on how to mitigate overgrown plants + create an integrative approach WITHOUT the



chemicals. It can and MUST be done to live in a healthy environment.

301. How about using goats???

302. Boulder County open space management has done an outstanding job of managing vegetation to enhance natural beauty, ecological services, and recreational opportunities. Please do not allow a small group of individuals to make it harder to achieve these lofty outcomes. Boulder county field staff must be recognized as experts in understanding the needs and options for open space management. They are the ones that walk the lands daily and see with their own eyes what's needed and what tools work. They have deep knowledge of integrated vegetation management and how to steward the use herbicides. They have carefully monitored outcomes that show increases in species richness, rare species returning, improved habitat and utilization by wildlife and pollinators, and improvements in recreational opportunities. They have participated in trials that test alternative vegetation control tools such as weed suppressive bacteria and soil amendments. They are cognizant of global forces and have worked with outside experts to start figuring out how much soil carbon is lost when deep rooted native perennial systems become dominated by exotic shallow rooted annuals. Please do not let people sitting in ivory towers or people that are well meaning but mislead by activists, dictate how to manage our lands. Please continue to use the full suite of needed labelled herbicides and aerial applications where needed.

303. The use of targeted approaches including herbicides has been proven to be effective in countless instances, with little to no harm done to native habitat. Using all available resources to combat invasive species is the most effective way to manage the issue.

304. I understand the concern around the use of herbicide. Unfortunately, it is the only way to control specific invasive species that are state listed and mandated for control. Deep rooted perennial plants such as leafy spurge cannot be effectively managed without herbicide. While I believe it is prudent to limit herbicide usage to plants that cannot be controlled other ways, I do not advise removing the most effective tool from the tool box.

305. The ecological and economic impacts caused by invasive weeds is enormous and all the available tools should be used including judicious use of herbicides by ground and aerial applications woven into an integrated weed management system. I worked with Boulder County extensively in my former career and they do an outstanding job of stewarding the land resources for the County and represent a perfect example of how to manage invasive weeds and favor native biota.

306. i'd like: moratorium on all pesticide use until BCPOS establishes a more science-based, inclusive public process that fully incorporates perspectives from ecologists and other scientists, moratorium on pesticide use for List B and List C noxious weeds, as well as weeds that are not on Lists A, B, or C, pilot program, using weed management money, for targeted grazing of weeds using regenerative practices

307. spray drifts

308. OMG, no aerial spraying! Why on earth are you even considering this? You will endanger wild animals and humans, especially children and those with health issues! Please stop considering this option. I will get loud if necessary to oppose this—please expect reporters, press, and demonstrations. Good grief.

309. We must stop the use of herbicide spraying immediately!!! Our soils, foods, water sources, and community are at a massive risk when exposed to these harmful chemicals! No aerial spraying treatments!

310. I strongly oppose the continued and proposed use of herbicides, particularly indaziflam (Rejuvra), in Boulder County's Draft Weed Management Plan. Herbicides have not been proven to reduce fire hazards effectively and are counterproductive to soil health and carbon sequestration efforts. Recent research also highlights the environmental and health risks associated with indaziflam, including its detrimental effects on soil microbiota and aquatic ecosystems. I urge Boulder County to: Institute an immediate moratorium on all synthetic herbicide applications until a more science-based, inclusive public process is established. Allocate funds for a pilot program employing regenerative land managers for targeted, strategically timed grazing as an alternative to chemical weed control. Implement rigorous monitoring and water testing at spray sites and downstream water bodies to assess non-target impacts. Prioritize independent, non-company-funded research to guide policy decisions affecting public and ecological health. Align the County's weed management methods with municipal laws and focus on identifying and addressing the root causes of noxious weeds. The public is asking for a change towards reducing or eliminating the use of these harmful chemicals. Please prioritize the health of our land, water, and ecosystems.

311. Stop the chemicals!

312. The Weed Management plans outlined are one of the most complete and comprehensive plans I've ever seen. Invasive weeds allowed to reproduce and take over open lands are dangerous to the environment and can displace native and endangered species. Herbicides need to be a component of any successful management plan.

313. Herbicides are an effective tool when used as part of an integrated weed management plan. If used wisely, they allow for a safe and effective means of weed management with little risk to human health or the environment.

314. Herbicides have not been proven safe for humans or bees, or other plants. Period. Many of the noxious weeds listed, like chicory, mullein, st johns wort and burdock root are medicinal. Please add more informed people to your staff that understand these plants and safe mitigation for all stakeholders (people, plants, animals, insects).

315. 1. Herbicide treatments have not been demonstrated to accomplish any significant reduction in fire hazard

for Boulder County. 2. Cheatgrass very likely contributes less to grassland fires than do the native and non-native grass species that the spraying campaigns seek to replace it with. 3. Spraying for cheatgrass is the opposite of the actions needed to sequester more carbon in Boulder County soils. 4. It will instead use more synthesized petrochemicals and damage the soils by altering its microbiota. 5. Recent research indicates unanticipated detrimental effects of the herbicide Rejuvra/indaziflam on soil microbiota may occur [1-3]. 6. Indaziflam is newly determined to be genotoxic for human cells [4]. 7. In aquatic environments, indaziflam is detrimental to and bioaccumulates in shellfish [5]. 8. According to its product label, indaziflam is toxic to aquatic invertebrates: on which, for example, the Lyons trout fishery lies depends. It is also directly toxic to fish. 9. The chemical binds to the topsoil and persists for several years. Storm events can wash it, still-active, into local surface waters. 10. Any large-area spraying of this Bayer-patented and proprietary chemical in County watersheds thus risks non-target effects on soils and surface waters. 11. Some publications [6] paint an unequivocally positive picture of the value of this chemical for weed control: even while others instead show detrimental effects on native flora and fauna. In this regard, the two senior authors of [6] both work for Bayer/Envu and actively promote the product for their company. The third author, Nissen, uses funding from the company to support weed control using chemicals. The fourth author, J. R. Sebastian, works for Boulder County, advocates use of this product by the County, and is also one of the inventors of this patented (Rejuvra) herbicide. 12. Company-supported research on this proprietary product is not an appropriate basis for major County policy decisions [7]. 13. Bayer (now ENVU) has engaged in a major advertising/public relations campaign across the western US to develop the Rejuvra market. But this same weed control chemical division of the former Monsanto was convicted in 2018 of various offenses; most notably of hiding and falsifying research about the potential public health effects of glyphosate (Roundup) [7]. 14. Yet Boulder County has since continued to use glyphosate up to today. Even though, “as of June 2020, Bayer was preparing to pay \$10 billion to settle tens of thousands of claims” [7]. Many other U.S. jurisdictions, including some in Boulder County, have, in contrast, ceased such use. 15. The draft weed management plan relies heavily on company-supported research. Where a non-company affiliated study is cited by the Draft Plan, the results are not portrayed objectively but instead are used to support Rejuvra applications for cheatgrass control. For example, from a Boulder County-sponsored study [8]: “For (short-lived) native species, in burned areas, richness was 75% lower in sprayed areas than unsprayed areas, and this difference was highly significant” (page 11). Also, in this Front Range foothills environment, “There was no evidence of a post-fire flush for *B. tectorum*” (cheatgrass). Thus, the fear of widespread cheatgrass invasion post-fire was not realized, a year after a local wildfire. That study also documents significant losses in species richness for native long-lived forbs in sprayed unburned areas. Native long-lived grasses also exhibited decreased richness in sprayed parcels. The spraying mainly favored perennial non-native grasses (see their Table 4) [8]. 16. In the above example, the County’s spraying regime using indaziflam clearly did produce some ecological harm by reducing native plant biodiversity. A year after the last herbicide treatments, this harm was still measurable. This is matched by other field studies from other western U.S. locations that show pervasive plant ecological effects [9]. Native forbs are negatively affected, as predicted even in the product label. Yet the present Draft Management Plan does not adequately describe or accommodate

these known and expected negative effects. 17. Finally, the current Draft Plan is at odds with municipal plans in cities and towns that abut county open space (for example, City of Boulder and Town of Lyons). In several cases, the County open space properties to be managed are even within the municipalities. Yet there is no effort to accommodate weed control methods to the laws governing these local jurisdictions. 18. Recommendation: The existing Draft Plan should not be approved, but instead sent back for major revision. To protect public and ecological health, a moratorium on synthetic herbicide chemical applications should be instituted in the meantime. Please ask that independent, non-petrochemical company funded research results be used. Require an independent, objective examination of the possible benefits together with the risks for every pesticide used in our public open space lands. The public is asking for a change: towards at least reducing the use of these poisons. So, ask that a Plan be developed that clearly moves in this direction. References Cited: 1. Mungroo, M.R., et al., Development of anti-acanthamoebic approaches. *International Microbiology*, 2021. 24: p. 363-371. 2. Siddiqui, R., et al., Antiamoebic Properties of Laboratory and Clinically Used Drugs against *Naegleria fowleri* and *Balamuthia mandrillaris*. *Antibiotics*, 2022. 11. 3. Wang, Z., et al., The neonicotinoid insecticide imidacloprid has unexpected effects on the growth and development of soil amoebae. *Science of the Total Environment*, 2023. 869. 4. Adigüze, S.K., The possible cytotoxicity and genotoxicity assessment of indaziflam on HepG2 cells. *Human and Experimental Toxicology*, 2023. 42: p. 1-8. 5. Tissot, A.G., et al., The silence of the clams: Forestry registered pesticides as multiple stressors on soft-shell clams. *Science of The Total Environment*, 2022. 819. 6. Clark, S.L., et al., Evaluating winter annual grass control and native species establishment following applications of indaziflam on rangeland. *Invasive Plant Science Management*, 2020. 13(3): p. 199-209. 7. Glenna, L. and A. Bruce, Suborning science for profit: Monsanto, glyphosate, and private science research misconduct. *Research Policy*, 2021. 50. 8. Alba, C. and M. DePrenger-Levin, Incorporation of indaziflam (Rejuvra®) into Boulder County Parks and Open Space Weed Management: A Post-Fire Assessment. *Denver Botanical Gardens Project Report*, 2021. 9. Meyer-Morey, J., et al., Indaziflam controls nonnative *Alyssum* spp. but negatively affects native forbs in sagebrush steppe. *Invasive Plant Science Management*, 2021. 14: p. 253-261.

316. No easy answers. Maybe not all 'weeds' are as detrimental as we think. Herbicides have their place but should be used judiciously and perhaps as a last resort and not as the central management strategy. Biological control also has negative impacts on native species. And tactics such as mowing disturb habitats as well.
317. Weeds are an immediate threat to the aesthetic beauty of our natural environment. Weed managers should have access to all tool available to them including mowing, grazing, hand-removal, and, yes, herbicides that have been approved by the US Environmental Protection Agency for this purpose.
318. While I understand that herbicide and pesticide use is generally the most economical solution for things like noxious weed & pest control, they also have many known negative consequences on people and ecosystems, frequently surpassing the negative consequences of abstaining from their use and using alternative control methods (biological control methods also often have collateral damage). In weighing

out all possible options, I cannot support any plan that lacks the safeguard of ongoing studies and data collection monitoring the full scope of possible negative impacts- known and as-yet unknown- recognizing that health, safety, and biodiversity impacts will exist and must be balanced with the tradeoffs and costs of other approaches. We cannot assume that what is most affordable for the county in the short term is actually more affordable when also calculating the costs of medical, environmental, and systemic costs incurred elsewhere and in the future when using chemical and biological control strategies. The value of our shared environment includes the value of being able to spend time in places that are absent of these control mechanisms that are still largely unstudied in their longitudinal impacts and are being found each year to have previously unstudied negative consequences.

319. Using herbicides and aerial spraying may address weeds but it completely misses the boat in terms of ground water, impact on pollinators, animals and human safety. Time to stop approaching problems like this from a myopic approach that hurts other areas of the ecosystem. Other approaches may be more time consuming at first but safer all around.
320. Look at Sri Lanka when they took away pesticides there were riots and severe uprisings. Herbicides are tools that must be used wisely or significant consequences will follow.
321. Spraying a substance a certain distance from sensitive areas she's not guarantee the substance will but go where it is not supposed to. With high winds and flash floods in Colorado, they can end up anywhere.
322. Herbicides constitute an important weed management component within an integrated management plan when used appropriately. Without judicious use of herbicide, the alternative management practices or not controlling certain weed populations can be more detrimental to the ecological stability of the area than the risks proposed b use of herbicides.
323. I agree with the talking points herein: <https://www.pesticidesbouldercounty.org/>
324. I am a native of Boulder County and a Beekeeper whose farm borders Boulder County Open Space. I am painfully aware of the continual increase in taxes that are collected and dedicated to Boulder County Open Space. These resources are unique and substantial, and should be used to take a bold approach in weed management. There simply is no reason to spray chemicals on the plants and soil which primary purpose is to kill living things. We are smarter than that. There are so many regenerative alternatives, including grazing practices, that should be employed, even if they are more costly than spraying chemicals on our land, soil, plants, wildlife and native pollinators. As one who grows native pollinator plants on my property, and my ranching activities require my livestock (honey bees) to graze on Open Space lands, it is imperative that we place a moratorium on the spraying of pesticides (not a requirement by the State of Colorado to manage weeds) until a more science based, data driven, and community formulated approach is developed. There is so much more that needs to be done in this area, including a more rigorous process for approving pesticide

types, like the one that the City of Boulder employs, and assessments of the effects of the current spray program has on our soil, water ways (a Boulder County natural creek passes through my property), plants, and native and agricultural pollinators. Our someday is today! Please, please take this time and place to do what is right, for the people of Boulder County and our children.

325. Keep dogs on trails.

326. Herbicides affect all life, noxious or otherwise. Boulder County is inundated with private herbicide applications; does the County need to add to the toxic burden? Does the County think a poison is contained and not cross a 660 ft. boundary? Are there considerations to wildlife, birds, insects? What is the real benefit of such action?

327. Rejuvra has negative impacts on native forbs and grasses.

328. Threat to ecosystems is way too high to support any spraying of herbicides, ever. Weeds are better than these poisons.

329. this was a highly biased survey that started out with a “weeds are good or bad” and then continues with questions on how to get rid of them. total bullshit approach from boulder county. you should be ashamed of yourselves.

330. I support grazing, mechanical removal and prescribed fire. My father was a city of boulder employee for thirty years and died from complications that came from the use of pesticides and herbicides on city open space lands. Herbicides should NOT be used on tax payer owned lands and it's negligent behavior if the county continues uses them into the future. It is shocking and appalling to me that you would even consider aerial application of herbicides. Please stop putting these harmful chemicals into our drinking water.

331. I am opposed to the use of herbicides on Open Space/Public land and would like to see Weed Management take place through the use of timed grazing and other efforts to eliminate noxious weeds through soil-promoting regenerative practices. All spray sites should implement protocols for studying short or long-term environmental impacts on water or non-target organisms.

332. Do Not Use Herbicides. Herbicides kill bees and other insects which are vital to the environment and the larger food chain.

333. Please don't use herbicides at all.

334. Pollinators, birds, wildlife etc. do not know about boundaries, therefore there is no such thing as “safe” aerial spraying- especially since you mention nothing about climate-caused drift; drift which also cannot be contained with boundaries.

335. Lousy survey- should be correlated with relevant links. Maps are useless because of visibility.
336. Herbicides endanger the health of humans. This is a known fact. As an environmental lawyer, I've seen the politicization of herbicides and the lobbying that occurs to deem these chemicals safe even in light of extensive evidence to the contrary. Even EPA approved herbicides have been involved in tort cases with extreme damages. We owe it to our children to think about their longterm health in making a decision that could have dire consequences and implications for generations to come.
337. I have managed my 10 acres in Boulder County since January 1974 as an organic farm with deference to wildlife (such as birds, e.g., meadow lark, mammals, e.g., bears, mountain lions, fox, etc, snakes, coyotes, various grasses); although I have actively trapped mice and rats as they try to damage tractors etc. I have never used herbicides or other toxics. For example, at one point a failed experiment with certain vegetables left me with a couple of acres dominated by thistle. With mowing, reseeding with "Rocky Mtn Seed Co. dryland mix", and minimal irrigation (despite the dryland label) I was able to establish nearly weed free grass pasture over a period of 5 years. I have also followed the work of Tim Seastedt on weed management on Open Space, often less easy to manage than irrigated pasture. I would recommend your taking seriously anything he might have to say this time around! Having followed the politics and economics of management of Boulder County lands, management of weeds in particular, the "thumb is on the scale" at every level -- from CSU, to state laws, etc-- to use herbicides, most often derived from petrochemicals . Following the money one is often led to the same places that have promoted "global warming" for decades (without calling it out as such :)). Thus far I believe there is almost always a way to manage grass, forest or shrub lands without toxics. Given enough time, I would say such is always the case.
338. How about you let the farmers guide you on best grazing practices to handle and reestablish strong and native ecosystems
339. Your questions concerning "herbicides" are difficult to answer because I strongly oppose commercial herbicides, especially Glyphosate, but there are eco-friendly herbicides now that I would agree to be used.
340. Weeds are one of the largest threats to ecosystem health. Control where possible.
341. With several decades of experience as a weed manager and herbicide researcher, I feel that well-selected and well-applied herbicide treatments are an important and economical mechanism for management of noxious weeds. In many cases, directed applications of selective herbicides are not only highly effective and economical but may also be less environmentally damaging than intensive grazing or physical controls such as dozers, cultivation or even hand pulling because of the soil disturbance. Weed management practices (or lack of weed management) all have impacts on the environment whether chemical, physical, or cultural in nature. Weed management plans developed by knowledgeable weed managers can evaluate the tradeoffs within the context of site-specific conditions and maximize weed control while minimizing negative impacts.



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Herbicides are a group of tools that should be in the toolbox of Boulder County weed managers.

342. The distance from residential areas is too small esp. with high risk of winds. And if aerial spraying is done then NO herbicides. If no herbicides and greater distance and taking wind risk into account re the number of days it takes for any product to settle into the ground than I can give my feedback.
343. burn tools volunteers hire more people very fully opposed to this use of herbicides
344. No herbicide!!! Come on.
345. Many years ago, when I ran a small environmental education nonprofit that connected middle and high school students with nature in their own communities, we used the *Sphenoptera jugoslavica* beetle on several sites that we visited to control Diffuse knapweed with success. Larvae mining the roots can cause significant damage and death to the plants. The depletion of root carbohydrates can kill the plant or retard rosette growth. Attacked plants are often stunted and produce fewer seeds the following season. This beetle prefers hot, dry sites with shallow, stony soils typical of those infested with diffuse knapweed. I hope you will try this instead of herbicide spraying of knapweed.
346. the pesticide used on wondercreek trail last year- active ingredient Imazamox-- is on the acceptable list for use in Boulder County They are listed as moderately damaging to pollinators and earthworms according to the city of Boulder. Even moderately damaging is not acceptable given the threat to pollinators that exists Also they have residue that stays in the air for hours causing respiratory difficulties. There is a high probability of leaching into the water table and there was water running all summer long near the application. The use of these pesticides presents a health hazard to humans as well as pollinators
347. you are being very irresponsible for spraying these toxins over the people without their knowledge- these cause cancer- this is public knowledge- very bad for our environment-
348. I don't care about weeds. I do care about herbicides damaging the health of our environment with unknown long-term effects. I do not trust industry-captured regulatory bodies.
349. Until further study of toxic impacts on wildlife, insects, water sources and humans has been completed and updated, I oppose any use of aerial spraying of herbicides. I especially oppose simply following the manufacturer's or the EPA's suggested guidelines as an adequate safeguard against toxicity.
350. Bottom line: little or no use of herbicides.
351. I just don't believe weeds should be sprayed if not managed with other native plants that can help push them out. Herbicides and other nasty chemicals eventually make their way into our water ways, water we drink, food we eat, and air we breathe. PUSH THEM OUT

352. Herbicide spot application and/or aerial spraying should not be done until research on non-targeted species, water contamination and toxicity studies are completed. The study areas mentioned are reducing use of herbicides over time and reducing invasive weeds but there is no information on the effect on bees, valuable insects or people in the targeted area. How was the aerial spray buffer determined? What is the aerial spray effect on non targeted species? How long for them to recover. Integrated Pest Management means minimizing the effects on all environmental species not just the “invasive weeds”.
353. Please reach out to local organizations that are experts in alternative methods that go along with nature and harm none. Herbicides can not be used. They are a danger to all.
354. Some of the questions above ask for either/or answers and I don’t think the problem should be addressed from that standpoint. We have a lot of wisdom in Boulder county about how to approach weed mitigation in regenerative ways. I encourage the board to be a leading example of how we mitigate weeds in Boulder county using regenerative methods rather than defaulting to chemicals which we know are harmful.
355. The EPA has been captured by corporations and I don’t trust their advice or policies. I believe we should act to protect plants, soil, frogs and other sensitive creatures AND people by avoiding herbicides altogether, and come up with better weed management policies that honor the entire ecosystem of life in this county.
356. This is not the way. Please listen to the people. Invasive plants are harmful but so are herbicides. Please don’t create another problem and put the health of our ecosystems, children, native plants, and animals at risk.
357. There are alternative solutions than harmful, unnatural chemicals! I support the ideas of Edaphic Solutions.
358. Just because the EPA authorizes it does NOT mean it’s safe as you surely know. And your plan does NOT have the necessary safeguards and does NOT evaluate sufficiently for the multiple adverse effects of those herbicides. We already have enough poisons in our lands and waters; we don’t need you spraying our county’s lands with more, and especially not from the air by ANY means. We can do better, Boulder County.
359. Please don’t use herbicides!
360. I am so deeply disturbed as a pesticide and herbicide-free gardener and farmer with bees on the land that herbicides such as glyphosate are being used along water ways and on land that abuts the land we live and grow on. Truly, this is an outdated method for a county that has a progressive stance on preserving the ecosystem. I truly hope that this stops immediately and I cannot believe that it’s even up for debate considering all we now know about the toxic effects of these herbicides on bees, native pollinators, and people. Thank you.

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361. You should contact your local native communities and seek resources on how to tend to the native land you are on. Elf Run Farms in boulder is a good place to start
362. Place a moratorium on all pesticide use
363. Fully against all applications of herbicides to public land beyond ultra targeted, site specific hand spraying (made safer with appropriate PPE)
364. Not sufficiently targeted and there will be wind drift even on still days. How do you ensure any nearby desirable plants aren't affected by drift? And it's ineffective on plants that need hack and squirt (such as tree of heaven and siberian elm- while not List A plants they create real issues). Does it work on Tamarisk or Oxeye daisy?
365. I'd increase the buffer to 100' from waterways and ecologically sensitive areas.
366. We need a moratorium on herbicide & pesticide use until a more inclusive public process is developed and implemented. For years, the county has relied on only the advice of the petrochemical industry and its proponents in managing these lands. We need to closely guard against harmful environmental impacts. We are the stewards of these lands and need to embrace our responsibilities to the land and its creatures. Our planet is imperiled. Choosing a "lesser" evil is still choosing evil. Don't do that.
367. These herbicides cause cancer. Don't use them.
368. Herbicide, when applied correctly, is a safe, efficient and effective tool that must be used as part of an integrated weed management plan to meet state mandate and protect biodiversity in Boulder County. The resource specialists that treat noxious weeds at Boulder County Parks and Open Space are top professionals in their field and should be recognized as technical experts in integrated weed management and herbicide application. Since this process to draft and adopt a new weed management plan in Boulder County began, I've been witness to the spreading of false information in regards to herbicide toxicity that is not based on peer reviewed scientific studies. Furthermore, without all the tools to manage noxious weeds, these invasive species will spread into neighboring communities, negatively impact critical habitat and become a greater financial burden for tax payers of Boulder County to shoulder.
369. Weed seed spreads through many different ways. As a landowner you need to make sure they do not spread to other properties. Including weed seed falling into irrigation ditches that run through your property, causing those property owners to use more spray on more acres to control. If you take any tools away from eradication of weeds you need to have a viable alternative in place before anything is banned.
370. I am in favor of a moratorium on herbicides until we have more information about the effects of herbicides. We need to look more at the impacts of spraying on the entire ecosystem. We don't need to rush

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into a solution mode until we have a better understanding of the effects of herbicides on the ecosystem.

371. I live on Ewald Ave. in Lyons. We have a 6 year old with autoimmune issues and live on a street full of kids, just uphill from the beautiful South St Vrain River. The helicopter spraying directly around our homes last year was devastating, frustrating, unnecessary, and unfair. You did not listen to your constituents.
372. Minimal use of herbicides and only as a last resort, targeted by hand. All nontoxic means of weed eradication should be implemented first. And NO use of glyphosate on county lands. Glyphosate should be banned in Boulder County.
373. Spraying is detrimental to our soil microbiomes, to human health, to our watershed and riparian areas. These treatments will negatively affect our ecosystem for decades to come. I work as a restoration ecologist.
374. Do not apply any pesticides. The risks are not all known. Hand pull. Volunteers will help.
375. Airborn application seems especially dangerous with winds and lack of specific targets to allow for more widespread application to animals and pets and people!
376. There are no isolated areas. Herbicides in the environment are toxic and pervasive. What if a drone or aerial application is followed by a significant rain event and the residuals make their way into waterways and irrigation ditches. I have also observed that herbicide applications are often followed by regrowth of undesirable species as a result of impacted soil ecology. Herbicides are also antibiotics that kill soil life!
377. Please use the goats. Recruit volunteers. I will come if asked. Employ natural remedies.- Cancer survivor
378. I studied food science and agricultural soil health. A variety of stuff has been sprayed on land around here since the 70's. Seems like we're castrating soil microbes- the starting place of healthy and bio diverse forests. Without them, you're left with dead land. I understand there's non-native species out competing our natives, but I think any/all of the non-chemical solutions are worth testing more.
379. Let them grow, a lot of them are not weeds and are medicine! Stop spraying poison and let the earth be. If they need to get cut back have an animal eat them.
380. Herbicides seem like an easy answer to the real, complex and frustrating problem of noxious weeds, but sadly they are not. Herbicides do far more harm than they ever help. The weeds just come back, spraying just begets the need for more spraying the next year as the soil micro biome is killed off and the life in the soil dies.
381. Herbicides are toxic to all forms of life. We've known this for decades. Let's stop using them.
382. What's the cost of aerial spraying vs non-herbicide means of weed management? On our land, every

year for 40 years was sprayed by various herbicides and every year the thistles came back. The two years after we stopped using herbicides, the thistles became more vigorous. We are now trying to use animal grazing mixed with mowing to achieve an integrated weed management system. It's my understanding that many chemicals applied to soils kill the soil microbiology that can favor native vegetation, while weeds and non-native species don't need our native soil biology to thrive- so once the herbicide wears off, the loaded weed seed bank in the soil is going to germinate once again as there will be no soil biology left to assist with germinating native vegetation.

383. Please stop using chemicals.

384. it's 2023. you can do better than this, boulder

385. Stop spraying toxic chemicals on our lands and open spaces. Please!!! We need our wild places to be safe for humans and animals. It isn't right or fair. Use other management. Our health and safety should be a priority. Toxic herbicides are harmful to human health!

386. In a time of global crisis it is astounding to me that Boulder County thinks spraying pesticides is going to help anything. Pesticides are poison. How do you not know this? These questions seem more appropriate for rural SW Kansas. I'm shocked ☹

387. As a land and farm owner in Boulder county it is critical to me that pollinators are protected and more thoughtful forms of weed management are implemented/ Weeds are a problem for me, we live adjacent to open space that has weed issues but using natural methods including mowing, grazing and pulling has solved the problem on my acreage.

388. Aerial spraying using the indicated guidelines makes sense for controlling weeds in isolated areas with steep terrain.

389. Cheatgrass is too short to be a source of fire danger according to multiple qualified sources on fire safety

390. The use of drones is a fantastic and creative way to proactively address fire risk.

391. Using herbicides as what seems like the primary tool according to the management plan not only goes against the ethos of us as Boulder County residents, it undermines the long term impact of ecosystems and waterways which are still undergoing observation. We know these chemicals are harmful to not only natural biological systems but to the humans and animals surrounding as well. We have other options like mobile grazing- better support for open space farmers- mowing and other fire mitigation techniques. The mission of "preserving biodiversity" is contradictory to the suggested methods of controlling "weeds". Furthermore, the plant species support pollinators and wildlife and themselves in courage biodiversity. Supporting grazing efforts and open space farmers seems to be a logical choice and actually generates food- both veg and

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meat.. Honestly I'm pretty disturbed that the officials drafting this plan can even consider themselves conservationist or naturalist with the intention to deploy herbicides by drone or helicopter. Have we learned nothing..

392. There are other ways to get rid of weeds that don't risk residence health and well being. Boulder County has a lot of resources and creative minds. There are other ways to manage land that doesn't create more toxicity, poor soil and poor health. Look to the local permaculturists and small organic farmers for knowledge. We can be a county that leads by example for the rest of the country.

393. unanticipated drift with our unpredictable winds makes aerial spraying too unsafe

394. Please stop spraying weeds.

395. The neglected growth of noxious all over the city of Boulder has put the community at increased fire danger. If you can't treat weed growth at least mow them down. It is sometimes impossible to get a clear view of traffic when entering major streets. Our elderly residents have found it a burden to keep cutting weeds in this summer's heat. Please put our taxes to work!

396. Please don't spray our land. There are other ways!

397. We must do better. Herbicides are known to cause problems of their own and are not part of the solution. They may mitigate weeds temporarily, while causing damage to the health of the soil, our environment, our people, and many of the animals and creatures who call our open spaces home.

398. I have lived on Boulder county for 27 years. I had thought of Boulder as an environmental friendly place to live. After hiking on open space for years and seeing that Boulder sprays chemicals on the land shocks me! This is so incongruent with the values of the men and women who live here. Have you even considered alternatives, like grazing, hiring someone who specializes permaculture or something like that. What sort of studies are you doing? Have you been monitoring the impact of these deadly chemicals on the water, animals, people, and insects. We are not separate from Nature. There are better ways that don't line the pockets of chemical companies. Stop poisoning our lands. Would it make a difference if you were held personally accountable for the damage from the chemicals? Where does this all stop?

399. I believe we can do better. The tree of heaven will not be controlled. The weeding that took place this year was not managed properly and people were working as slow as snails, and making a good wage.

400. I've had cancer and I wouldn't wish it on anyone. Using herbicides is not worth the risks.

401. I'd rather see natural, regenerative practices, such as using grazing animals, goats etc and or planting native species to counteract invasive threats

402. I do not agree with pesticides, herbicides, toxins.
403. I believe nontoxic forms of weed control should be used. Our ecological system is too precious to use toxic forms of weed control.
404. If the county can't afford, or find, enough goats it should consider buying them. They should be used before anything else.
405. Please use best available science to explore all methods of noxious weed control, including regenerative agriculture and grazing, before herbicide use. Herbicide use should be a desperate last resort, and be carefully targeted.
406. Boulder County staff are dedicated to creating healthy environments. They should be encouraged to continue this valuable work with access to all the available tools.
407. There is NO place for herbicide use in Boulder. The dangerous impacts to human health and wildlife from these poisons is widely known. I strongly oppose the use of any herbicides. I live backing open space and this terrifies me. We manually pull the invasive weeds surrounding our home. Spend the resources to educate homeowners to do the same and use resources to hire teams to manually mitigate weeds in open spaces.
408. These substances always end up having negative side effects that are not initially obvious. Think DDT, or EPA approved pesticides like atrazine. Any and all use of chemical herbicides provides a massive risk to precious ecosystems. They can never be used in a safe and strategic way.
409. What is designated as a weed? A plant that spreads successfully and is not necessarily beautiful to human eyes. Let the natural order be, we already have claimed so much land with buildings and paved streets
410. Even goats don't like cheatgrass. They'll eat everything else first.
411. Boulder county should NOT start using aerial spraying to eradicate the weed problems in Boulder County! There are so many known problems with aerial spraying, such as drift and the toxins reaching and untargeted pests and getting into water ditches and groundwater.
412. Many of the farms in Boulder county that supply food to our community are organic farms. I am an organic flower farmer in east boulder. I sell flowers to the public as well as an all local organic wholesaler. It is essential to the health of the soil that herbicides not be used. It is essential to my health, as someone who works intimately with the earth, to never use pesticides. I work tirelessly to manage weeds with organic methods that are effective. Water will carry Glyphosate and other herbicides throughout the land. It will ruin farms, farmers, and the community at large. I'm shocked that this measure is a consideration. An alternative would be to educate the public on invasive weeds and allow for responsible foraging. There are people

within this community that know how to work with these amazing plants and their benefits.

413. drop the aerial spraying entirely. The county and its contractors are certain to misapply herbicide using aerial spraying. Stick with the integrated approach outlined in the plan otherwise. Just drop the aerial spraying component.
414. Ecologies change over time. Our resources are better spent adapting than trying to keep it from changing.
415. Please take pause before going through with spraying! So much will be negatively affected by this. I hope the people show that they do not want this too.
416. County is doing an extremely poor job of mowing and cutting down invasive weed all along the Lobo trail. The invasive weeds are taking over all the native plants and grass along the trail. Please address this situation. Thank you.
417. EPA relies on data produced by the manufacturers of these products. Manufacturers produced data that said agent orange only targeted vegetation. Do we never learn from our history? Aerial dispersment threatens much more than just the targeted weeds or pests. It harms critical ecosystems. Most treatments require direct contact to be effective. Direct, targeted application in wildfire interface zones (from the ground, NOT aerially) may be warranted, but should be the last resort not the first.
418. I recognize that many weeds, especially invasive grasses, are difficult to manage and may require chemicals. But all other methods should be used first, including mowing, fire, targeted grazing, and volunteer seed head removal/digging projects. Volunteer seed collections and cleanings are popular and fill up. I do not see as many opportunities for weed control and believe that many volunteers would help out if the county made such opportunities available and widely advertised them. Not putting more weeds into the environment is also critical. Last week I attended a County Extension workshop on grasses in which the presenter advocated smooth brome as a good pasture grass, and in my training as a volunteer naturalist, a county employee defended the planting of brome along roadsides for erosion control. The use of invasive pasture grasses on open space and all agricultural areas should be banned to prevent further spread. Finally, the county employs many extremely competent and bright plant and wildlife ecologists who have extensive knowledge and familiarity with how to manage our open spaces. Priority should be given to their input rather than to outside consultants or public surveys that are likely to reflect emotional opinions, as most of us members of the public have limited knowledge of the complexities of these issues.
419. This an opportunity for Boulder to lead the way using regenerative land stewardship practices like managed animal grazing and investment in restoring landscapes rather than using chemicals and herbicides that only exacerbate issues in the long term
420. 1/8 of a mile is too close to residential areas. 50-100 feet is WAY too close to waterways or ecologically



sensitive areas

421. The risks of using herbicides outweigh the benefits. Some herbicides are non-biodegradable and are harmful for a long period of time. They are toxic and cause cancer. They can cause other illnesses. They can be carried into streams by runoff rainwater or leached into underground water supplies polluting them. Herbivores may eat the plants treated with herbicides and then carnivores eat the herbivores. The toxic herbicide would be passed up the food chain increasing in concentration each time resulting in cancers and even deaths.
422. I have been on many of the CSU/Boulder County Field Days the past 10 years, and have witnessed the positive ecosystem response after treating the invasive species. This has been a noticeable increase in native biodiversity and decrease in wildfire risk associated with cheatgrass fine-fuel. Much of the Colorado front range has extremely rough terrain that is inaccessible for ground applications. I believe Boulder County even had a very serious ATV accident with an employee a few years back that was fatal. With the tours I have noticed very sharp treatment lines showing that aerial applications are accurate and staying where they are applied.
423. For the steep / inaccessible terrain, it feels like this is presented as aerial weed management or no weed management. Aren't there any other choices, like seeding (by air) those steep/inaccessible slopes with vigorous natives that might choke out the weeds? Additionally, is there any metric of the density or noxiousness of the weeds before treatment is merited?
424. The risks to the environment, including our wildlife, are too great to use herbicides.
425. 1/8 of a mile is not enough to protect homes from from aerial spraying efforts. Ecologically, the presence of weeds is informing us about the current state of the soil and stage of ecological succession. By fighting against weeds with herbicides, we continually reset the soil back to zero, creating the soil conditions that perpetuate weeds. There are more effective ways to manage weeds than spraying.
426. Herbicides are toxic to humans and animals and should never be used. Grazing and community weed pulling is a better way to go.
427. Many plants considered "weeds" provide beautiful medicine. The use harmful, toxic herbicides to kill these not only impacts humans but all the sentient beings of the Earth. It is so important to preserve what little of our land has been untouched by the building of condos, strip malls, etc. It would be cruel and greatly damaging to poison these lands with chemicals.
428. Herbicides and aerial spraying are detrimental to humans, animals, and other plants. Regenerative practices should be utilized over harmful chemicals.

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429. We do not need to be spraying poisonous chemicals on all of our land. We can connect the fabric of our communities and neighborhoods to promote healthy natural growth of a variety of plant life. This is absolutely absurd and I do not want this in my community.
430. Especially concerned about the continued advancement of cheatgrass and other annual grasses across the western US landscape. This concern includes higher elevation areas that have experienced fire and were previously forested.
431. I believe my father and an uncle, both farming in northwest Missouri in the 60s and 70s, died as a result of being exposed to herbicides and other farm chemicals. Please do not use these as they not only kill people, but precious insects and birds, many already threatened.
432. The short term benefits of herbicides are outweighed by their long term impacts, and their impact cannot be localized in the way the plan requires. Wind and water, for example, will carry the herbicides beyond their intended target, killing other plants and animals in their wake, and impacting the water supply in ways that we do not understand nor can control. Boulder County needs to DO BETTER.
433. Please do not spray our community with herbicides. I have young children and health issues and 100% am against this happening. Please reconsider and do not spray our lovely community. We are intelligent, caring, hardworking, educated people and can find better solutions. What about a community wide weed clean up day? Get the schools involved, educate our little ones and get them involved and invested, get the high schoolers out doing day trips working on weed control. We do NOT want any herbicides or pesticides sprayed and will leave the area until they are gone, should you choose to continue with this plan. Thank you for your consideration.
434. If you're spraying herbicides, then I oppose spraying.
435. Use of herbicide cause more problems than benefits
436. Please use all options available to control weeds on open space. Repeat as necessary.
437. This is not wildfire mitigation as fire is due to climate and weather NOT fuels, as proved by wildfire science and history. Please quit using this false narrative. Damaging logging, cows (observed to be very hard on riparian areas this summer and wiping out the wildflower "super bloom" we could have enjoyed), and herbicides are wrong choices. Direct this \$ to home hardening, defensible space and land protection. You should be worried about projecting a false sense of security to homeowners when you propagandize the importance of these treatments. Herbicides have no place on Open Space where people like to sample wild edibles and connect to pure nature. I would like a SHIFT from Open Space acquisitions from ag lands to foothill and mountain areas for biodiversity enhancement. The weed, water and prairie dog issues on valley, ag or ag adjacent properties would lessen. Please embrace the Biden 30 by 30 initiative (or 50% as Vermont

is doing), educate us about why it's needed, and vastly amp up acquisitions other than ag lands.

438. I work in cancer research and hemetological tumors are on the rise due to pesticide and herbicide use
439. We live along left hand Creek where our dogs and children play in the water, and we enjoy the wildlife that depend so greatly on this ecosystem. We do not want our children, pets, and wildlife being contaminated by chemicals that are sprayed into our waterways by drones and helicopters. There are many other ways to affectively mitigate these weeds. They do not need to involve the use of herbicides.
440. MPOS is responsible as the steward of these public lands. Cheatgrass is a major risk contributor to fires such as the Marshall fire. Cheatgrass is not a noxious weed as defined by regulations. It is a major threat to open space plant diversity and fire suppression efforts. Broadcast spraying of approved herbicides should be in the arsenal of methods to control this vigorous species threat or our open space.
441. Aerial spraying contains risks inherent to this type of herbicide delivery system- blowing winds, wildlife in areas where spraying occurs, etc.
442. I'm a native plant educator but strongly oppose the use of herbicides. For years, professionals said Roundup was benign. Now we know differently. Health effects on humans are unknown until these chemicals are in widespread use. Let's use other IPM options for weed management in Boulder County and be an example for Colorado.
443. I believe that we see weeds as the problem, but weeds are actually the results of the problem. It is the patterns that put the weeds there in the first place that are causing them to proliferate. Just getting rid of the weeds doesn't change those patterns at all- they will just come back. We should be focusing on regenerating landscape health, minimizing human disturbance, and looking at the holistic picture rather than waging a toxic war against weeds, which only perpetuates their existence.
444. any aerial spraying causes herbicides to spread in the air to unintended areas. Herbicides are known to be cancer causing. Herbicides wash off into our water which is a great concern of mine.
445. Dear Honorable County Commissioners, I write to you today as a concerned resident of Longmont, CO and a dedicated Land Stewardship Specialist at Drylands Agroecology Research. The stewardship of our public lands is a matter of great significance, and I implore you to please consider the following points in your deliberations: 1. Advocate for a Pesticide-Free Approach: State law does not mandate the use of pesticides for weed management, offering us a flexible and ecologically responsible approach. 2. Call for a Moratorium on Pesticide Use: I urge the establishment of a science-based, inclusive public process, akin to the Fireshed Working Group, to better incorporate diverse perspectives from ecologists, scientists, nonprofits, community leaders, and staff. 3. Prioritize Alternative Management Methods: Specifically, I propose a moratorium on pesticide use for List B and List C noxious weeds, as well as those not categorized in Lists A, B, or C. Let us

explore targeted grazing through regenerative practices as a pilot program, funded by weed management resources. 4. Rigorous Pesticide Approval Process: Request a more stringent evaluation process for approving individual pesticides for use on public lands, mirroring the City of Boulder's commendable standards. 5. Comprehensive Monitoring: Implement protocols for monitoring spray sites and downstream water bodies to assess impacts on non-target organisms, water quality, soil health, and drift. 6. Water Quality Testing: Seek transparency on water testing efforts at spray sites, along impacted ditches, in surface water, and groundwater. Advocate for funding to ensure downstream neighbors and Open Space lease-holders have their water tested for potential pesticide impacts. 7. Historical Data Preservation: Urge Boulder County to maintain and make public all pesticide application records dating back at least five years, for the purpose of future environmental toxicity studies. 8. Address Root Causes of Noxious Weeds: Encourage a proactive approach to identify and rectify the underlying causes of noxious weed proliferation. 9. Harmonize Pesticide Use with Soil Health Initiatives: Seek clarity on how pesticide applications align with the County's soil health initiatives and ensure they do not impede progress towards healthier, more sustainable soils. I implore you to consider the long-term impact of pesticide use on our beloved public lands. Let us embark on a path of responsible stewardship, one that celebrates the diverse perspectives that make our community thrive. Thank you for your dedicated service to Boulder County, and for your consideration of these vital matters. Sincerely, Anthony Levy Land Stewardship Specialist Drylands Agroecology Research Longmont, CO

446. I have been a volunteer for BOCO Parks pulling weeds and other resource work. As a toxicologist and natural resource specialist, I oppose the use of herbicides MOST of the time. I think the County over-relies on its use. Never use it near (200') of waterways or property boundaries. I don't trust aerial spraying in a populated county like Boulder. More effort needs to be expended controlling weeds earlier in their life cycle along trails. My wife agrees with me.
447. If you're concerned about fire prevention, stop building houses so close together like the ones in Louisville. Stop packing people into the front range.
448. We have a responsibility not to treat mere symptoms, but to get to the root of the matter and discover what imbalance is leading to this disruption of our ecosystem. Soil health and biodiversity are of the utmost importance to our community. Under no circumstances is dumping chemicals on our precious public lands the answer. We are a smart and capable group of informed citizens-- we can and must do better than this. Let's dismantle the Weed group and create a Holistic Ecosystem Health Council to really research and understand these complex issues. Let's stop taking the lazy and short sighted way out please.
449. These toxic herbicides should never be used by Boulder County. There are no circumstances where they are the only solution.
450. The problems posed by weeds that cannot be managed without herbicides are much less damaging than the problems and risks to human health and ecosystem health posed by the use of herbicides.

451. Graze and mowing seems like best practices...including making sure that high grass (even non weeds!) are mowed and grazed in the fall for fire mitigation! Let's be responsible and keep the grass and weeds LOW going into the winter!
452. What about fire for management
453. From a permaculture perspective, use of herbicides is a poor choice. We can absolutely do better here.
454. My family's neighborhood was Ariel sprayed, and our children broke out in hives the next day, the helicopters were a nuisance, and the chemicals are deadly to the environment. There are many scientific papers available about these chemicals that may have been passed by the EPA. It's better to have some weeds (managed in other natural ways that have been proven to have more longevity), rather than poisoning the environment and our waterways with chemicals (many of which are banned in other countries and have long-term effects). Not to mention the high cost of Class action lawsuits that will surface over the years to come. Please consider this important issue.
455. The best weed management is the cultivation of robust native plants. Herbicides poison our waterways and harm native plants that our struggling pollinators depend on. Research-based permaculture practice indicates the application of herbicides ONLY using the "paint-on" method (applying liberally to stumps of trees/woody perennials), as this is the only method demonstrated not to affect native plants and wildlife via overspray. Herbicide application should only be done by hand, as the last-step tool for eradicating aggressive woody-stemmed trees, shrubs, and vines. Aerial spraying of herbicides is a human and ecosystem health hazard.
456. The herbicides you plan to use have been shown in numerous peer reviewed studies to degrade the health of living systems; namely, the shikimate metabolic pathway found in the majority of species that reside in the soil. While I understand the desire to manage noxious weeds, the potential risk to soil health (particularly in a semi-arid climate) is too great. We MUST NOT resort to herbicide treatment as a matter of fundamental resiliency of this bioregion. Thank you for reading.
457. Can't make a case for aerial weed spraying with an appropriate airport to manage such equipment. Would be a shame to get rid of KBDU...
458. I am a 22 year survivor of Non Hodgkin's Lymphoma, strongly correlated with glyphosate and other herbicides. Pollinators, plants and people are best served by eliminating toxins from our environment. This survey's wording shows the bias toward toxins, which is unfortunate and has serious consequences for our environment and all beings.
459. NO: no aerial spraying

460. I think that you people should put the ducking UTE back in charge
461. We must use regenerative practices! The soil needs to be fed and anchored to the Earth! Create a pilot program, using weed management money, for targeted grazing of weeds using regenerative practices. It's time for the County to be paying regenerative land managers to manage weeds through targeted, strategically timed grazing. Actively, consistently, and regularly monitor the spray sites and downstream water bodies for non-target impacts (insects, aquatic organisms, water, soil, and drift). The current Draft IWM Plan does not list any protocols for studying short or long-term environmental impacts on water or non-target organisms. Post every single pesticide application going back at least five years and not to destroy the historical data, for use in future environmental toxicity studies. Consider and identify root causes of noxious weeds and address those, as well. Until we take a more wholistic, wisdom-based approach, we cannot move forward and our environment and us will suffer.
462. There must be holistic management methods- from grazing, hand pulling, to mulching in place with organic materials to build soil, then seeding other beneficial native plants that can outcompete the noxious weeds..
463. Herbicides kill pothier plants and animals and are in the groundwater. Please stop using them. We need to ask people to volunteer to help eradicate the weeds.
464. EPA is not a reliable source for 'safe' herbicides. Perhaps European standards could be used.
465. some weeds are foods for certain insects- many of these plus the native pollinators probably have as yet unknown roles in the ecosystem
466. Nature heals itself.
467. Who determines which are weeds are which plants are an important part of the natural ecosystem. Stop destroying the earth with chemicals that kill the bees and harm the wild life. Just stop.
468. I'm concerned about soil health, human health, water health and and wildlife health when pesticides and herbicides are used. More testing of the soil, water, wildlife and local population must be done. And, until it's done, there should be a moratorium on the use of chemicals in Boulder County
469. Pull out the roots! Stop poisoning our water! The presence of invasive species is far less threatening than herbicides! Stop funding chemical companies and start employing indigenous people!
470. The pesticides that Boulder County has used in the past have warning labels for aquatic life. There are also many times the aerial separating affected people in close proximity. Absolutely NO to any pesticide use!

471. Herbicides should not be used at all IMO
472. We, as a community, a state, a nation and world need to work diligently at reducing the amount of pesticides we add to the environment. I know weed management without the use of any herbicides is problematic. I am currently voluntarily managing a small (<1 acre) native grassland restoration in our neighborhood, and it is a ton of work, hand weeding with some mowing/weed whacking to control my weeds, but I am making progress.
473. Lightening and people start fire...Weeds are not the problem and anyone that doesn't understand what these chemicals do should not work for Open Space.
474. No chemical pesticide or chemical herbicide application is safe. These chemicals bioaccumulate along with all the other toxins humans and wildlife, including pollinators, are exposed to. Poisoning people, wildlife, and the food chain is unacceptable, even in "small doses". Boulder should be a leader in banning the use of these chemicals by our local governments.
475. All other practices other than chemical sprays should be used whenever possible!
476. I have worked very very hard to have an organic garden in boulder county, near open space. I adamantly oppose spraying open space as a means of eradicating weeds.
477. Aerial spraying should only be used as a last resort- it's not very precise
478. Please use more eco friendly policies and controlled burns over pesticides.
479. I am against the use of herbicides and pesticides, period. I feel there are many other choices to be made before resorting to spraying or applying poison to our lands. The use of chemicals always has an effect besides the intended one, and the main loser in this is soil! Our degraded soils are the reason "weeds" are out of balance. We solve nothing by killing off more of the many, many organisms that make up healthy soil. The best approach is regenerative, and while that probably looks scary to those who are still in the past with the old mindsets of spray and destroy, I believe we can embrace a new way of looking at our lands with the idea that "weeds" are merely showing up because we have gone out of balance. Strategic grazing seems to me to be a great idea. Getting volunteers out to hand pull and deadhead. All the ideas besides resorting to poison. Changing our mindset to realize that if we are in balance, we will have some "weeds", but our healthy, regenerated soil will keep them from taking over! Please bring in more experts and farmers who are practicing regenerative agriculture and having success with rebuilding our soils! Also, there need to be many more studies done on the effects of herbicides on local waterways. Thanks for your consideration.
480. I agree that this is a very complicated issue, with no easy solutions. I believe that the use of herbicides is very dangerous regardless of the EPA saying they are safe. They are not safe. They are poisonous to the

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humans applying them, they are poisonous to the soil the water ways the insects that use the plants that are sprayed. I am a volunteer butterfly researcher for Boulder County Open Space and i have watched the decline of butterflies and other insects over the past 15 years. I think the change that needs to take place is to change the way we think about weed management and begin to think in terms of eco restoration. I think this culture has failed to realize the true value of nature. We are too busy killing things instead of restoring what we have damaged. Recreation has become too motorized making nature a “backdrop” instead of an ecosystem. Bicycles and all the motorized wheeled recreational vehicles are bringing seeds with them. This type of recreation has a big impact on local wildlife. I know there are other ways to manage the land that will increase the health of the land. Thank you, Venice Kelly

481. Herbicides are poisons that affect us and the flora / fauna around us. They should not be used.

482. The wind carries herbicides via aerial spraying. It will affect the surrounding areas whether intended or not. Wildlife and humans may very well be sensitive or allergic, and harmed. Lawsuits aren't fun.

483. Do not spray any chemicals. Period. This includes compounds deemed to be “safe” by a lab report. We all know the reality of what happens in the future and how many studies are swayed/misleading.

484. I live surrounded by open space next to Boulder reservoir and I don't want any poison used anywhere near my property especially not from air spraying!!!!!!

485. Use goats, hand pulling. Targeted spraying

486. It is not worth the risk to our water, air, earth, wildlife, and community safety to continue to spray these chemicals. We can come up with better strategies to contain weeds that do not continuously poison ourselves. It's time to wholeheartedly embrace strategies that protect our environment and health. Thanks

487. There are effective ways to manage most weeds without herbicides, especially on public lands. I support using regenerative practices for weed management, and more collaborative work with ecologists. I also support the call for Boulder County to implement a more rigorous approval process for individual pesticides for use on public lands.

488. If we want to restore the land, we need to use whatever we need to use to restore the land!!!

489. Thank you for the questionnaire. Having researched this, I find that the EPA and other gov't agencies who are supposed to protect People, Animals ( including wild animals) have approved dangerous levels of these herbicides. There is really NO oversight when it comes to ensuring that these applications actually are the distance that the law states from residential areas. How do you control the wind? The youth corps used to hand pull weeds. We have seen a massive decline in recent years of bees, butterflies and hummingbirds among other spring insects. Not only does the herbicide spraying need to stop and more natural remedies



used, but the planes dropping the toxic metals also need to stop. It was a horrible year for gardens/farms in Boulder County, many of us notice the dirty skies after these drops and the changes in weather. The herbicides and metals are in the rain and snow fall. The snow does not melt like normal now. Put snow in a pot and melt it. You can see and smell the chemicals. Not the Colorado we used to have. Pls stop the madness, get back to loving the people, the animals and the land. Stop the Smart City agenda. Thanks for reading. Have a wonderful day.

490. I'm opposed to pesticide use on public land, and remember that state law does not mandate the use of pesticides for ANY weed, it just mandates varying levels of management, which does not have to include pesticides. There are better ways to deal with weeds — we have to think of our systems holistically and find ways to heal out land for the benefit of all. What Boulder County needs is an Ecosystem Health Management Department that holistically restores and manages ecosystem health.

491. Herbicides are toxic chemicals that are polluting our waterways, harming local animals in the ecosystem, and causing long term negative effects on our health (e.g. cancer, endocrine disruptors/ hormone disorders, etc.). We didnt fully know the long terms effects of using such harsh chemicals so widely and now are dealing with the consequences.

492. Seriously? Stop!

493. Non-herbicidal methods should be used to control weeds. There are many alternatives to herbicides with far less associated risks.

494. Stop using herbicides. Plant native vanguard species to curb invasive ones.

495. Supporting our pollinators is logistically more important to long-term ecological health than managing "weeds". Even prickly Russian thistle feeds the bees and other very significant pollinators. Pesticides harm insect populations (and therefore local ecology) greatly enough to be worth the use on the noxious, many of which aren't a direct threat to society.

496. Stop killing everything with your death sprays!!

497. It is horrible to have these sprays land on our hills in Lyons- we have deer and bear and big cats and fox and children around here.

498. No Pesticides or herbicides should be used at all. Please keep Boulder County Open Space organic and free from chemicals.

499. Stop using anything that can degrade our land and create alternatives! The previous reversal to allow pesticides again did not look into HOW to financially support the beet farmers so they could make the

transition.

500. What Boulder County needs is an Ecosystem Health Management Department that holistically restores and manages ecosystem health.
501. All chemicals and pesticides/herbicides have toxic side effects for children, animals, the environment and adults! Please be mindful of everyone's health. Thank you requesting the surgery.
502. Herbicides are highly toxic to the environment and our people. We need to stop spraying and prioritize public and environmental health.
503. I think it is absolutely crazy that you are considering such dangerous and harmful products.
504. I've had a bad myrtle spurge problem a tmy house and have spent over \$500 having it sprayed twice professionally and have done it myself as well as pulling multiple times. I've contacted Boulder County a few times as well but there is no follow up. I know the weed is in Betasso Preserve as well.
505. I consider waterways to be a more sensitive area that property lines, and should have more than a 50 foot consideration for spraying. Helicopter spraying leaves too much room for drift. Drone use for spot applications of otherwise completely inaccessible areas is acceptable, but also hard to believe that they are areas in Boulder county that drones can reach but goats cannot. I support the use of goats and other ruminants to maintain grasslands and to eradicate weeds.
506. There is factually NO way to control even targeted spraying of herbicides. In addition, they still land on the plants, the ground, and leech into water systems and impact beneficial and desirable and necessary plant life and wildlife.
507. None of us, including animals, need to be exposed to any more toxins than we already are. Please stop spraying herbicides
508. As a mother of two small children, I vehemently oppose use of these toxic, cancer causing chemicals. The harms to our community and ecosystem are too great. Glyphosate for example has a proven track record of being toxic to the nervous system ie, neuro inflammation, mitochondrial dysfunction, oxidative stress etc. It is also well known to cause cancer as well as disrupting the endocrine system. Boulder claims to be environmentally friendly yet wants to spray us with these toxic chemicals? What hypocrisy! These herbicides will also negatively affect our water supply as well! Please go back to the drawing board and don't be so lazy as to dump this poison on us because of some weeds. Get goats, flame weeding, white vinegar with salt and a little dawn dish soap, Hand pull weeds. We HAVE to do better for our community and dumping poison on the earth and into our waterways is not the way forward.

509. I am opposed to any substances that might endanger bees or other insects that are already threatened. In addition, potential impact to uninformed walkers/hikers and dogs/wildlife. Thank you. I realize this is a complicated issue.
510. We have a growing body of case studies that show how to do this organically. We know how to do this without harmful chemicals. EPA writes permits to pollute as a friend who retired after 18 years there told me. We can do so much better. And we have the means and the political support to!
511. How would you keep the spraying from drifting and blowing to undesired areas? Why are there no questions about the other methods besides herbicides? Do you inform people living close to these areas before spraying? Do you study the long-term effects upon animals, water, soil etc in areas being sprayed.? Are the animals affected by the spraying of herbicides? How helpful are the other methods? I would love to see more goat and sheep grazing. How about manual pulling/cutting/mowing? How effective are the other non herbicide methods?
512. Although I see the need to eradicate these weeds to comply with state rules, Deaver se threats of wild fires and increase biodiversity i believe there are many other methods that can just as effectively eradicate weeds and have less consequences. First I want to re state the possible negative impacts of herbicides, if not administered carefully they could end up in our water systems and have dire consequences for human health and agriculture. Now for possible solutions a grazing program that uses sustainable practices like rotating the animals to ensure soil health and to make sure all vegetation is consumed in those areas, using different groups of volunteers or incentivizing farmers with live livestock to come out to these properties. Mowing these areas with weeds could also be a viable solution. One other solution is due to the nature of cheat weed it grows during late spring and early summer this could open up a window for controlling burns where there is not as much danger since the ground is wet. Finally using volunteers groups to pick these weeds manually could be viable in areas where the other practice are hard to do. Thank you for viewing my ideas and I am excited to see the new plans( I will also be at the meeting on the 26 to discuss the issue more) Thank you
513. Make volunteer opportunities more visible
514. Herbicides have a long term affect on water, pollinators etc. I see so few pollinators on open space trails where herbicides are currently used. Saying that EPA have approved and has minimal negative effects is a joke
515. I recognize the importance of combatting weeds, and herbicides are a tool in the toolbox. Don't support aerial spraying without additional study on off-target impacts to other plants, and don't like the idea of drone use for herbicides. Too militaristic and spraying remotely without people on the ground to be accountable and accurate seems like a bad direction to be heading.

516. Get rid of the Poison Ivy!!!!
517. Herbicide & Pesticides proposed are known (backed by current research) endocrine disruptors (cause cancer) & neurotoxins: causing death to essential pollinators, aquatic species, wildlife & humans. There are other cost effective, SAFE methods of mitigating weeds. PLEASE USE them! NOT Environmental TOXINS!!!
518. The weeds are getting out of control and if we need controlled use of pesticide- in the short term- to get these out of native ecosystems, let's do it. I do suggest considering the power of animals to help bring down weed pressure too.
519. Decade after decade, industry lies to us about the harms. Decade after decade, government policy works repeat discredited industry talking points. Mothers, babies, working men and women pay the price with shortened life spans, immense medical bills, and other forms of pain and suffering. Some of us are growing organic food and eating pasture-raised animals to optimize our health. 660 feet means nothing. Don't use poisons in Boulder County. People live here.
520. Weed management in hard to access/ steep incline areas is important and can be achieved through the use of grazing by goats. I do not accept the statement that herbicide spraying via helicopter is less expensive than the use of grazing with goats. I note the reference to a past agreement with CDW disallowing the use of goats west of HW36 to avoid interference with Bighorn Sheep. Consider revisiting this agreement in light of changing needs ie strong disagreement by the local population to the use of herbicides on lands adjacent to Lyons.
521. Herbicides threaten wildlife, native plants, and humans. They shouldn't be used on Boulder Cty open space. Additionally, more notice should be given to residents impacted about any potential chemical use.
522. Trust the experts not the loudest voices
523. Any kind of aerial spraying has risks of getting into private property and affecting local ecosystems and waterways beyond the targeted spray everywhere.
524. Both aerial application methods need to be acutely aware of "drift" caused by wind. Also, aerial spraying needs to be timed to possible rain events
525. I understand the need for herbicide application for managing large acreage. However, we must be judicious in their application and implications it has on clean drinking water and native species. Blanket applications prove to be nothing but a quick fix with great repercussions long term.
526. Rotational grazing not poisonous herbicides should be used

527. Steam weeding and compost tea (biological soil amendments) can and should be used as an alternative to spraying herbicides! The only thing we should be aerial spraying is compost tea!
528. Chemicals poison people, animals, water... There are less toxic approaches. Please use those.
529. I would like to see the buffers widened for the use of herbicides. I don't think they should be used within an 1/8th of mile with any form of application of any residential or agricultural land or near waterways. I would really like to see this plan demonstrate an increased commitment to testing water, soil and drift challenges with herbicide application. If staff has determined it is essential to salvaging an ecosystem it should be as a last resort and they should have to demonstrate that and demonstrate a commitment to harm reduction as a part of their decision-making process. I don't love seeing 'cost' as a reason not to use livestock. There is also economic benefit to be gained by contracting with farmers and ranchers so it isn't just an expense to use this method, it pays back in other ways. Wish this plan acknowledged that benefit and more clearly stated some of the real challenges with herbicide use. Again, not against herbicide use, I know it's an important tool. I don't think there are enough checks and balances in this plan and I don't think there is enough of a commitment to avoiding them at all reasonable costs.
530. Boulder County can and should do better managing weeds WITHOUT chemicals. Supporting volunteers with education, tools, and encouragement can be a strong and beneficial approach to weed management. Our community can do this!
531. Aerial applications should not be used. The herbicides travel on breezes/wind and fall far outside the intended territory, making them exceedingly dangerous. Some of these chemicals also enter the water table; people in Kansas and Nebraska have assorted cancers, and their well water was determined to be pesticide and herbicide infiltrated. Also, just because the EPA has given approval as "non carcinogenic" or approved to use does not mean too much, since long term effects and penetration into the ground water affect humans and other animals long after initial use, e.g., look at the initial approval of the Neonicotinoids, Glyphosate, and other such herbicides and pesticides, which have been proven to cause cancer and other diseases. There are many good reasons that these older chemicals and the new ones, including Rujuvra, and the separate 2,4,D portion of Agent Orange are banned in Europe. Can we be wiser here? My brother died of lung cancer attributed to Agent Orange/2,4,D exposure in the war in Vietnam. Don't foist these chemicals on our children...or any life. And especially not in any sort of aerial spraying.
532. Do not use pesticides in your weed management plan. These harmful chemicals are banned in other countries for a reason! The safety of our citizens and animals is paramount to creating a healthy Boulder.
533. These toxic chemicals are incredibly detrimental to boulder county's water supply. The science backing the "safety" of these chemicals has been funded by the very companies that are making these chemicals. Do the research- Monsanto was facing HUGE multi million dollar law suits for trying to cover up the harm

of these chemicals, all the execs jumped ship, and they sold the company to BAYER. BAYER is the company that produces endosulfan, the noxious chemical you are suggesting we aerial spray on our lands. I am a farmer and have had extremely high success managing for noxious weeds using rotational grazing. We all need to have this conversation- this is a values based conversation. Do we want to support ecological land management through effective rotational grazing, producing healthy local meat for our community, or poison our water supplies and make these chemical companies even more rich????? The answer I think seems pretty simple

534. Aerial spray of most herbicides is NOT recommended by EPA, due to spray drift poisoning unintended targets (humans, bees, fish, etc., etc.). Read the documents!

535. Lack of management by Openspace is not fair to private land owners. Private land owners cost and diligence are both increased. Look what Olin farms did to your 100 acres.

536. There is always a way to manage weeds without poisons.

537. Boulder county knows better than to use herbicides, especially by way of aerial spraying. Be responsible stewards of our land.

538. The chemicals have an ecological affect also and are being used in areas that don't matter like the top of Indian lookout. Who cares if there r weeds up there and how can u even tell. This is being done near homes and animals. If u really want to get rid of the weeds use goats. Also, the helicopter noise is disruptive.

539. No more chemicals

540. I know chemophobia will reign in these comments, but an integrated and evidence-based approach is needed to manage publicly-managed lands and resources.

541. Aerial spraying goes 100% against all legitimate best available science, as does the use of toxic herbicides/pesticides in 99.9% of cases. Why is Boulder County so far behind in this? There are much better and vastly more effective ways to control noxious weeds, and Boulder County can afford to do so.

542. Many other non-toxic methods can be utilized & applied (rather than herbicides & pesticides which pose significant risk to Environmental & Human Health)... cattle & herd grazing, etc... etc.. are examples of ways to mitigate & eradicate invasive species. Not ALL invasive species are a threat. Spraying drifts & enters waterways & is detrimental to healthy ecosystems (pollinators, wildlife & humans)

543. I'm for anything that will kill them! Our town looks terrible.

544. Increased efforts to eradicate all classes of noxious weeds should be increased and enforced upon boco

jurisdictions that do not follow the integrated weed management guidelines.

545. The survey gave the option of yes, or no answers, and that does not pan a complete picture of the objections. I have to spraying herbicides. The trade-off between having weeds along with some of their negative affects , and spraying toxins that pollute our environment and have been proven to cause negative health outcomes... Seems fairly simple. To have no choice, but to be exposed to these chemicals, sprayed from the air onto the places where we recreate, goes against our right to clean air, water, and food. Please consider not only the average healthy person, but also those of us with immunocompromised systems. Thank you

546. Please research alternative means of weed management

547. This information discusses eradication of weeds. There is NO mention of reseeding efforts in areas affected by use of weed sprays. Short sighted! Also if rain occurs after a treatment of aerial spraying how will it affect the surrounding area. How will the spraying adversely affect insects, plants, animals, humans in the short and long term? Many of the current weed issues are a result of the Four Mile Fire and the later flooding!!! We did not have many of the type of weeds that are problematic now before the fire and floods! Education is imperative and a collaborative approach is suggested.

548. Herbicide use on public lands goes against the values of Boulder County citizens and using taxpayer money and staff time on herbicide application is very disheartening to see when we have so many citizens and local businesses going out of their way to remove these toxic chemicals from their homes and businesses. These same citizens and business owners have alternatives that work with nature rather than trying to dominate her. If a complete herbicide ban is not an option, at the very least there should be a ban on aerial spraying or broadcast spraying of these synthetic chemicals which impact much more than the targeted species. Why is the county doing NO monitoring of runoff into our agricultural and drinking waters when the EPA labels for most all these herbicides clearly state they are toxic to aquatic life and that their biggest potential environmental hazard is contamination through runoff? Please go back to the drawing board on this plan and engage local municipalities such as City of Boulder who have proven alternatives. Most importantly work with the county's youth and the farmers feeding our community and relying on clean source water in the development of a plan that will best support future generations. Were all the comments from the public tours about ecological monitoring and a transition to more grazing and community partnerships systematically ignored? It seems like the only people Open Space are interested in collaborating with when it comes to weed management is chemical companies and extension agents- same record on repeat- with less and less chance for public feedback every round.

549. Organic, sustainable agriculture is the future. The ends do not justify the means. The use of herbicides depletes the biome and fosters the growth of weeds, poisons bees and other pollinators, birds etc. List C species do not require you to intervene. Aerial spraying of a chemical herbicide is chemical poisoning of

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people and the environment.

550. Would like to know if City of Boulder Open Space will be addressed as well. We border city of boulder open space and have class B noxious weeds invading our property due to agricultural use of open space.

551. The Town of Lyons is surrounded by BCPOS-- and is evident in your map. However, it is also a watershed for drinking and for flora and fauna. NO AERIAL spraying is appropriate within an 1/8 mile or even a 1/2 mile. No thank you. Not EVER. There are some amazing regenerative agriculture experts in Boulder County (Ollin Farms, Yellow Barn, Meta Farms, Black Cat, etc)... I would reach out to them for alternatives to helicopter spraying. 50 Feet from waterways?? No... please NO more.

552. The proposed integrated approach to weed management makes a lot of sense. Judicious use of herbicides ought to be one of the tools and aerial spraying application seems like a good way to treat areas that are hard to get to. Drone technology has come along way. We should be using it to support our vanishing native ecosystems!

553. Follow the City of Boulder's No Chemicals / No Nonsense approach. Follow the Colorado Department of Agriculture's List C guidelines which do NOT require ANY intervention at all. Leave the cheatgrass alone. No arial spraying of products containing ingredients known to be neurotoxic, and no spraying at all of products with undisclosed ingredients. Stop spraying Round-up pro and closely monitor conflicts of interests with Bayer-Monsanto and POS employees.

554. We need an ecosystem health management plan, not just a weed management plan. Noxious weeds on list A and sometimes B should be controlled but without the use of herbicides. EPA approval is no indicator of safety. They evaluate for \*effectiveness\* not environmental safety. The EPA also, it should be noted, tests active ingredients. The majority of the mixtures you are applying contain unknown/undisclosed chemical brews that could contain PFAS and who knows what else. That's the point. We shouldn't use our public lands to find out! And BCPOS is not, according to this plan, conducting any environmental impact assessment or follow-up scientific testing on the impacts to aquatic, soil, or invertebrate life that these chemicals have. Case studies are not science. You can't take one photo three years apart (in December and May!) and compare them and conclude that an application of an herbicide was the only factor. County weed managers should be collaborating with ecologists, soil scientists, biologists and others who have the credentials to assess the impacts these chemicals are having within our public lands.

555. I'm worried about drift, contamination of groundwater, poor communication by the county, and unintended spray recipients.



# Cheatgrass Studies/Publications

Front Range Studies are highlighted in yellow.

## Wildfire

### Historical Wildfire Information | Fire Prevention and Control (colorado.gov)

Colorado Division of Fire Prevention and Control, compilation of wildfire history information including largest wildfires, acres burned, frequencies of largest fires, and most destructive to homes. 20 of the 20 largest Colo wildfires occurred in the past 20 years. 4 of the 5 biggest wildfires occurred in the past 3 years. 2 of the 3 most destructive wildfires to homes occurred in the past 3 years.

### **Long-Term Effects of Repeated Fires On The Diversity And Composition of Great Basin Sagebrush Plant Communities**, Adam Lee Mahood, Thesis, Tim Seastedt, advisor

Abstract Excerpt: Exotic plant invasions and wildfires have combined to convert these systems into those composed mostly of exotic annual grasses and forbs at a broad scale. While it is well documented that annual grass invasions are increasing wildfires, and that exotic annual grasses thrive after fire, the lasting effects that multiple fires have on plant communities are unclear. Here we show that over a three-decade period repeated fires had long-lasting effects on community and composition of Wyoming big sagebrush communities.

### **Postfire Downy Brome (*Bromus tectorum*) Invasion at High Elevations in Wyoming**, Brian A. Meador, Samuel Cox, and D. Terrance Booth

Abstract Excerpt: The invasive annual grass downy brome is the most ubiquitous weed in sagebrush systems of western North America. The center of invasion has largely been the Great Basin region, but there is an increasing abundance and distribution in the Rocky Mountain States. We evaluated postfire vegetation change using very large-scale aerial (VLSA) and near-earth imagery in an area where six different fires occurred over a 4-yr period at elevations ranging from 1,900 to over 2,700 m. The frequency of downy brome increased from 8% in 2003 to 44% in 2008 and downy brome canopy cover increased from < 1% in 2003 to 6% in 2008 across the entire study area.

Principal component analyses of vegetation cover indicate a shift from plant communities characterized by high bare soil and forbs immediately postfire to communities with increasing downy brome cover with time after fire. The highest-elevation sampling area exhibited the least downy brome cover, but cover at some mid elevation locations approached 100%.

### **Seed Bank Depletion: The Key to Long-Term Downy Brome (*Bromus tectorum* L.) Management**, Derek J. Sebastian <sup>a</sup>, Scott J. Nissen <sup>b</sup>, James R. Sebastian <sup>c</sup>, K. George Beck <sup>b</sup>

Abstract Excerpt: This field study was conducted at two sites in Colorado to evaluate the longevity of the downy brome soil seed reserve and its implications on long-term downy brome control.

### **Fuel Properties of Effective Greenstrips in Simulated Cheatgrass Fires**, Devan Allen McGranahan, Carissa L. Wonka

Abstract Excerpt: Invasive annual grasses alter fire regime in steppe ecosystems, and subsequent trends toward larger, more frequent wildfires impacts iconic biodiversity. A common solution is to disrupt novel

fuel beds comprising continuous swaths of invasive annual grasses with greenstrips—linear, human-maintained stands of less-flammable vegetation.

**Cheatgrass: Management Implications in the 90's**, Thomas C. Roberts, Jr.

Abstract Excerpt: Concerns with Cheatgrass are, range forage problems, wildlife forage problems, recurrent fire problems, and complications caused by shrub die-off.

**Indaziflam: a new cellulose-biosynthesis inhibiting herbicide provides long-term control of invasive winter annual grasses**, Derek J Sebastian, Margaret B Fleming, Eric L Patterson, James R Sebastian and Scott J Nissen

Abstract Excerpt: indaziflam treatments resulted in superior invasive winter annual grass control 2 years after treatment (from  $84 \pm 5.1\%$  to  $99 \pm 0.5\%$ ) compared with imazapic ( $36\% \pm 1.2\%$ ). Indaziflam treatments significantly increased biomass and species richness of co-occurring species 2 years after treatment.

**Cheatgrass increases flammability of native perennial grasses in laboratory-based combustion experiments**, Georgia Harrison, Eva Strand, Tim Prather, 2023

Abstract Excerpt: Perennial grasses mixed with cheatgrass, even in small amounts (25% cheatgrass biomass: 5 grams of cheatgrass with 20 grams of perennial grasses), had increased flaming duration, maximum temperature, and mass consumption compared to when perennials were burned alone.

**Introduced annual grass increases regional fire activity across the arid western USA (1980–2009)**

Jennifer K. Balch, Bethany A. Bradley, Carla M. D'Antonio, José Gómez-Dans

Abstract Excerpt: Furthermore, multi-date fires that burned across multiple vegetation types were significantly more likely to have started in cheatgrass. Finally, cheatgrass fires showed a strong interannual response to wet years, a trend only weakly observed in native vegetation types.

**The human–grass–fire cycle: how people and invasives co-occur to drive fire regimes**

Emily J Fusco, Jennifer K Balch, Adam L Mahood, R Chelsea Nagy, Alexandra D Syphard, Bethany A Bradley

Abstract Excerpt: Invasive grass species can alter fire regimes, converting native terrestrial ecosystems into non-native, grass-dominated landscapes, creating a self-reinforcing cycle of increasing fire activity and flammable grass expansion.

**Recent Increases in Bromus Populations on the Nevada Test Site**, Richard Hunter

Abstract Excerpt: Ecosystem changes resulting from the grasses include an increased tendency for propagation of fire and possible decrease in diversity of the native ephemeral flora. Discussion section, cheatgrass led to increased fire frequencies (Stewart and Hull, 1949).

**Historical wildfires do not promote cheatgrass invasion in a western Great Plains steppe**, Lauren M. Porensky & Dana M. Blumenthal, 15 July 2016

Abstract Excerpt: In western North America, positive feedbacks between wildfire and *Bromus tectorum* (cheatgrass) invasion have contributed to widespread plant community conversion. Impacts of conversion include reduced biodiversity, wildlife habitat, and livestock weight gains, as well as increased costs associated with firefighting and ecosystem restoration.

**Cheatgrass-Wildfire Cycle – Are there any Solutions?** Mike Pellant

Abstract Excerpt: Wildfire suppression and rehabilitation are complicated due to the wide extent of flammable, annual vegetation types.

**Changing Fire Frequencies on Idaho's Snake River Plains: Ecological and Management Implications,** Steven G. Whisenant

Abstract Excerpt: Prior to the arrival of white settlers fire return intervals in the sage brush – steppe probably varied between 60-100 years, but much of the region now burns at intervals of less than 5 years.

**Indaziflam reduces downy brome (*Bromus tectorum*) density and cover five years after treatment in sagebrush-grasslands with no impact on perennial grass cover,** Jacob S. Courkamp<sup>1</sup>, Paul J. Meiman<sup>2</sup> and Scott J. Nissen<sup>3</sup>

Abstract Excerpt: Imazapic reduced *B. tectorum* initially, but did not affect density or cover at either site beyond 21 MAT. Reapplication did not substantially improve *B. tectorum* control at 57 MAT in plots treated with intermediate and high indaziflam rates, suggesting that long-term control with a single indaziflam treatment may be possible in some cases.

**Fire needs annual grasses more than annual grasses need fire,** Joseph Smith, Brady W. Allred, Chad Boyd, Kirk W. Davies

Abstract Excerpt: Sagebrush ecosystems of western North America are experiencing widespread loss and degradation by invasive annual grasses. Positive feedbacks between fire and annual grasses are often invoked to explain the rapid pace of these changes, yet annual grasses also appear capable of achieving dominance among vegetation communities that have not burned for many decades.

Although annual grasses and wildfire are so tightly associated that one is rarely mentioned without the other, our findings reveal surprisingly widespread transformation of sagebrush ecosystems by invasive annual grasses in the absence of fire. We argue a pivot from predominantly reactive management (e.g., aggressive fire suppression and post-fire restoration in heavily-infested areas) to more proactive management (e.g., enhancing resistance and managing propagule pressure in minimally-invaded areas) is urgently needed to halt the loss of Great Basin sagebrush ecosystems.

**Cheatgrass (*Bromus tectorum*) distribution in the intermountain Western United States and its relationship to fire frequency, seasonality, and ignitions,** Bethany A. Bradley, Caroline A. Curtis, Emily J. Fusco, John T. Abatzoglou, Jennifer K. Balch, Sepideh Dadashi & Mao-Ning Tuanmu

Abstract Excerpt: Cheatgrass (*Bromus tectorum*) is an invasive grass pervasive across the Intermountain Western US and linked to major increases in fire frequency. Despite widespread ecological impacts associated with cheatgrass, we lack a spatially extensive model of cheatgrass invasion in the Intermountain West.

**Effect of repeated burning on plant and soil carbon and nitrogen in cheatgrass (*Bromus tectorum*) dominated ecosystems**, Rachel Jones, Jeanne C. Chambers, Dale W. Johnson, Robert R. Blank & David I. Board

Abstract Excerpt: Fire has profound effects on ecosystem properties, but few studies have addressed the effect of repeated burns on soil nutrients, and none have been conducted in cold desert ecosystems where invasion by exotic annual grasses is resulting in greater fire frequency.

## Wildlife and Pollinators

**Impacts of Cheatgrass on Mammal, Bird, and Butterfly Populations in a Rocky Mountain Foothills Grassland**, Anyll Markevich, Stephen R. Jones, , Christel Markevich, (BCOS Small Grant Report)

Abstract Excerpt: We studied impacts of cheatgrass (*Anisantha* spp.) infestation on mammals, birds, and butterflies in a foothills grassland south of Lyons, Colorado. We found a significant negative relationship between total mammals and cheatgrass cover of plots ( $p=.02$ ) and an insignificant negative relationship between mammal species richness and cheatgrass cover of plots ( $p=.15$ ). While bird abundance and bird species richness was greater on low cheatgrass plots, these trends were insignificant ( $p>.10$ ). There was a significant negative relationship between butterfly abundance and cheatgrass ( $p=.04$ ) as well as a highly significant relationship between butterfly species richness and cheatgrass cover of plots ( $p=.001$ ). These results suggest that cheatgrass infestation in foothills grasslands may reduce populations of mammals, butterflies, and possibly birds. Cheatgrass should be considered when managing wildlife and wildlife habitats.

**Small Mammal Response to Rejuvra Treatments on Three BCOS Foothills Properties**, Jesse Dillon, Penny Hunter, Cedar Creek Associates, (BCOS Small Grant Report)

Abstract Excerpt: This study aims to evaluate the effects of Rejuvra at a higher trophic level by studying the effects on small mammals. Live-trapping of small mammals was used to compare species richness and species diversity between native habitats and habitats restored with Rejuvra. Overall, our findings suggest that the incorporation of targeted action Rejuvra within BCPOS properties does not have a significant impact on small mammal diversity. There was a greater species richness and evenness observed within treated sites, however our sampling was not robust enough to demonstrate this statistically. Additionally, both treated and native sites had similar percentages of non-adult individuals (20%, 25%, respectively), suggesting Rejuvra does not substantially impact the fecundity or fertility of breeding adults.

**Pollinator-friendly flora in rangelands following control of cheatgrass (*Bromus tectorum*): a case study**, Arathi H.S., Janet Hardin

Abstract Excerpt: Invasive winter annual grasses, such as cheatgrass (*Bromus tectorum* L.) are considered serious threats to regional biodiversity. Pollinator populations that depend on the native flora are likely to be negatively impacted as these native species may be displaced by the invasive grass species. Herbicide-treated plots had higher richness and alpha-diversity measures across all three locations suggesting that the control of *B. tectorum* could result in reduced competition allowing for the reestablishment of native flowering plants.

Our results support the premise that controlling the invasive annual grass *B. tectorum* can have beneficial impacts on the rangelands by improving the richness and abundance of native flora in the region. Our study shows that flowering species reappearing in the year following indaziflam application include annuals, biennials, and perennials, many of which are native to the region, agreeing with the earlier report that indaziflam application for *B. tectorum* control does not appear to negatively impact native species richness in the natural areas and rangelands of Colorado.

## Soil and Microbes

**Moisture pulses, trace gas emissions and soil C and N in cheatgrass and native grass-dominated sagebrush-steppe in Wyoming, USA**, U. Norton<sup>1</sup>, A.R. Mosier<sup>1</sup>, J.A. Morgan<sup>1</sup>, J.D. Derner<sup>1</sup>, L.J. Ingram<sup>1</sup>, P.D. Stahl<sup>1</sup>

Abstract Excerpt: Effects of large-scale weed invasion on the nature and magnitude of moisture-pulse-driven soil processes in semiarid ecosystems are not clearly understood. The objective of this study was to monitor carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O) emissions and changes in soil carbon (C) and nitrogen (N) following the application of a water pulse in Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) communities dominated by the exotic annual grass cheatgrass (*Bromus tectorum*) and by the native perennial grass western wheatgrass (*Pascopyrum smithii*)

**Plant and soil microbial community composition legacies along a 5-year time series gradient post-indaziflam (Rejuvra™) herbicide treatment**, Ember Bradbury, Amy Gill, and Caroline A. Havrilla,

Colorado State University, Dept. Forest and Rangeland Stewardship

Abstract Excerpt: The changes in plant community and soil health may be the drivers of this change, as application of indaziflam significantly increased native plant presence, and decreased cheatgrass plant and thatch cover by as much as 80%.

**Short-term Effects of Indaziflam on Non-native Brome Grass (*Bromus* spp.), Biological Soil Crusts, and the Endangered Dwarf Bear Poppy (*Arctomecon humilis*)**, Tara B.B. Bishop<sup>1,\*</sup>, Alyson M. DeNittis<sup>2</sup>, Sydney O.H. McGovern<sup>2</sup>

Abstract Excerpt: Controlling invasive annual grasses is one of the top conservation priorities in the American West. Intact biological soil crusts are important in a biological communities' ability to resist invasion by annual grasses and are critical for nutrient cycling. However, there is a lack of research on how herbicides affect biological soil crusts and specific rare plant species that are of high conservation priority. We found that indaziflam, applied as a preemergent, was effective at reducing brome density the first growing season after application. Indaziflam also did not initially injure the biological soil crusts. Indaziflam is reported to have multiyear effects of reducing annual grasses, which makes indaziflam a promising herbicide for conservation purposes in areas where the invasive species seed bank needs to be depleted with as little disturbance to biocrusts as possible.

**No evidence of three herbicides and one surfactant impacting biological soil crusts**, Mandy L. Slate, Rebecca A. Durham, Chuck Casper, Daniel Mummey, Philip Ramsey, Dean E. Pearson

Abstract Excerpt: We tested the impact of three widely used herbicides, indaziflam, imazapic, aminocyclopyrachlor, and chlorsulfuron, two of which were applied with or without a surfactant, on biocrusts dominated by mosses or lichens in intermountain grasslands. We found that neither the herbicides nor surfactant impacted biocrust moss or lichen cover within 2 years of their application.

**Soil morphology and organic matter dynamics under cheatgrass and sagebrush-steppe plant communities**, Jay B Norton <sup>a</sup>, Thomas A Monaco <sup>b</sup>, Jeanette M Norton <sup>a</sup>, Douglas A Johnson <sup>b</sup>, Thomas A Jones <sup>b</sup>

Abstract Excerpt: The results of our study showed important differences in soil morphology and the distribution and composition of SOM in soils underneath intact and cheatgrass-invaded Wyoming big sagebrush-steppe plant communities. These differences suggest that soils under cheatgrass-dominated plant communities have shallow, rapidly cycling SOM pools. Together with other recent studies (e.g. Gill and Burke, 1999; Evans et al., 2001), these results suggest that cheatgrass invasion has led to a loss of SOM, leading to impoverished sites difficult to restore to native perennial vegetation.

**Cheatgrass Invasion Alters Soil Morphology and Organic Matter Dynamics in Big Sagebrush Steppe Rangelands**, J. B. Norton

Abstract Excerpt: Our results suggest that conversion of diverse native plant communities to cheatgrass, leads to losses of SOM and changes in their composition and distribution. The magnitudes of these changes may intensify with the time that cheatgrass dominates, limiting the prospects for restoring areas.

**Effects of Soil Conditioning by *Bromus tectorum* on Decomposition Rates of Plant Litter and Soil Properties**, Hayley Lyon

Abstract Excerpt: My results indicated that litter from native plants is insensitive to the altered cheatgrass environment, while cheatgrass litter decomposes at a significantly slower rate on its own altered soil than on unaltered native soil.

## Native Vegetation

**Effects of precipitation change and neighboring plants on population dynamics of *Bromus tectorum***, Janet Prevey, Tim Seastedt

Abstract Excerpt: In the Front Range of Colorado, *Bromus tectorum* (cheatgrass) and other non-native winter annuals have invaded grassland communities and are becoming more abundant. As the global climate warms, more precipitation may fall as rain rather than snow in winter, and an increase in winter rain could benefit early-growing winter annuals, such as *B. tectorum*, to the detriment of native species. The results of this study show that increased winter precipitation benefitted population growth of *B. tectorum*, especially when the biomass of nearby native plants was low.

This study has important implications for the management of disturbed or invaded ecosystems in a changing climate. Currently, climate and land use change are creating disturbances that can reduce competition from the resident community and increase the success of colonizing invasive plant species (Hobbs and Huenneke 1992; Dukes and Mooney 1999). Invasive species, such as *B. tectorum*, may be

able to exploit changes in precipitation patterns that natives cannot. Management actions that favor natives need to be considered along with management actions that directly reduce *B. tectorum* populations.

**Effects of Short-term Soil Conditioning by Cheatgrass and Western Wheatgrass**, Janet Prevey, Tim Seastedt

Abstract Excerpt: The exotic grass *Bromus tectorum* (cheatgrass) is a ubiquitous invader in the western USA. Cheatgrass is a proficient competitor, frequently displacing native plants, forming monotypic stands and reducing biodiversity in ecosystems it invades.

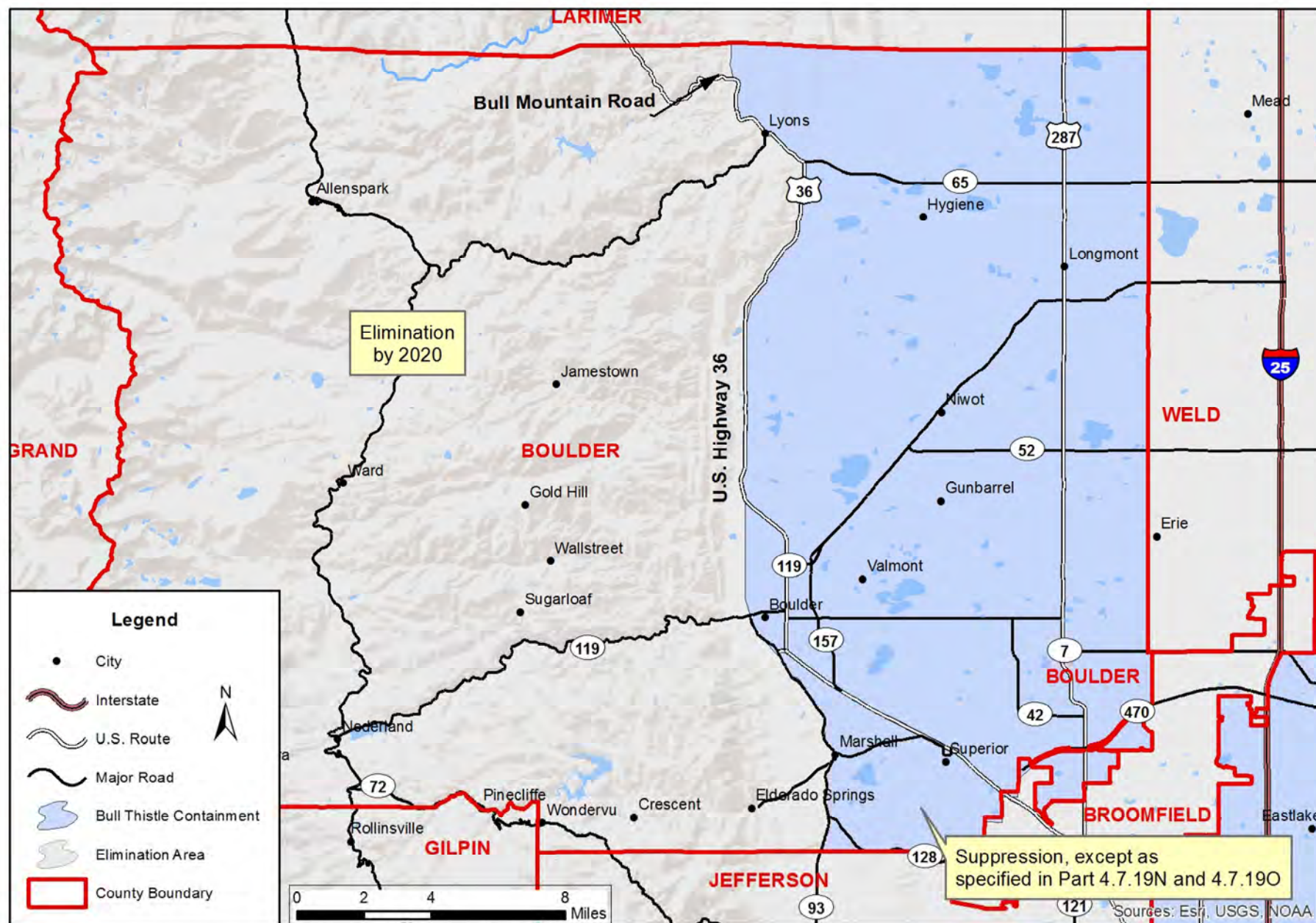
**Effects of precipitation change and neighboring plants on population dynamics of *Bromus tectorum***, Janet Prevey, Tim Seastedt

Abstract Excerpt: Soil modification by cheatgrass may promote invasion and persistence of the species. Examining soil properties of regions susceptible to cheatgrass invasion could help land managers prepare and prioritize their efforts to minimize the spread and introduction of cheatgrass. Additionally, the positive response of native grass grown in cheatgrass-modified soil suggests that restoration with native species may be possible if cheatgrass is removed from areas it has invaded.



# Bull Thistle (*Cirsium vulgare*) Boulder County

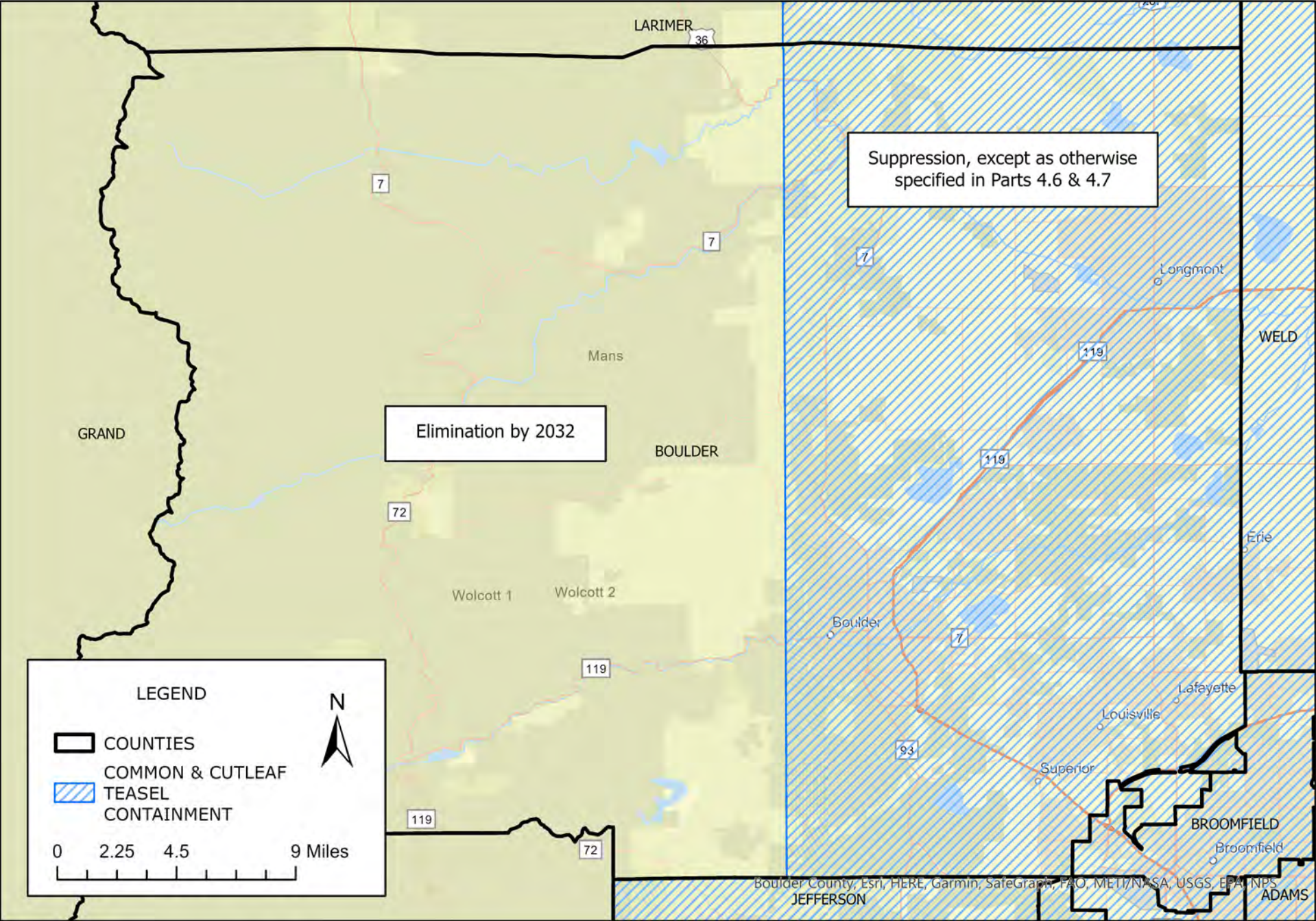
Figure 16.02





COMMON & CUTLEAF TEASEL CONTAINMENT (*Dipsacus fullonum* & *D. laciniatus*)  
BOULDER COUNTY

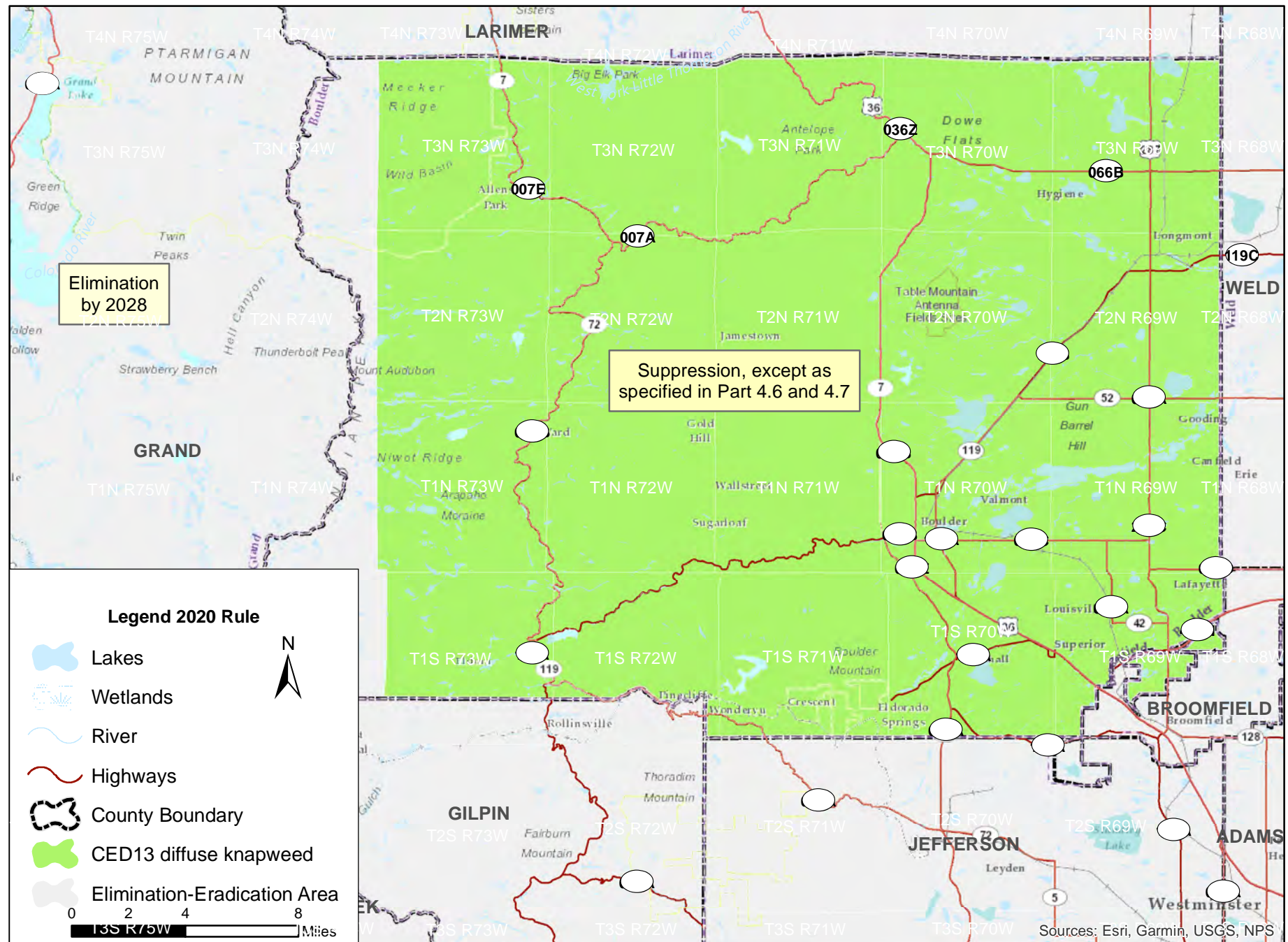
Figure 4.8.24.4





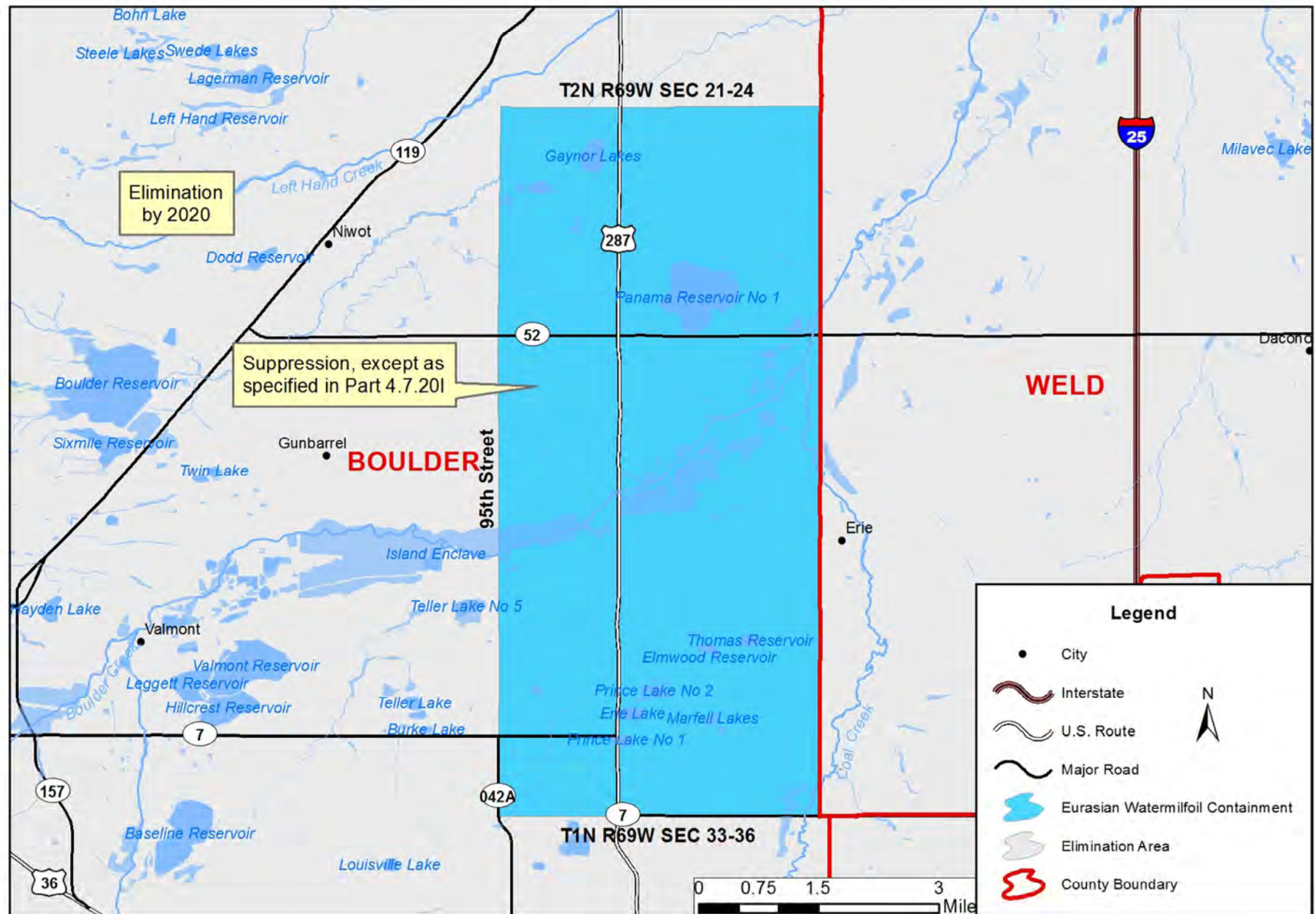
# Diffuse knapweed (*Centaurea diffusa*) Boulder County

Figure 4.8.7.3



# Eurasian watermilfoil (*Myriophyllum spicatum*) Boulder County

Figure 17.02

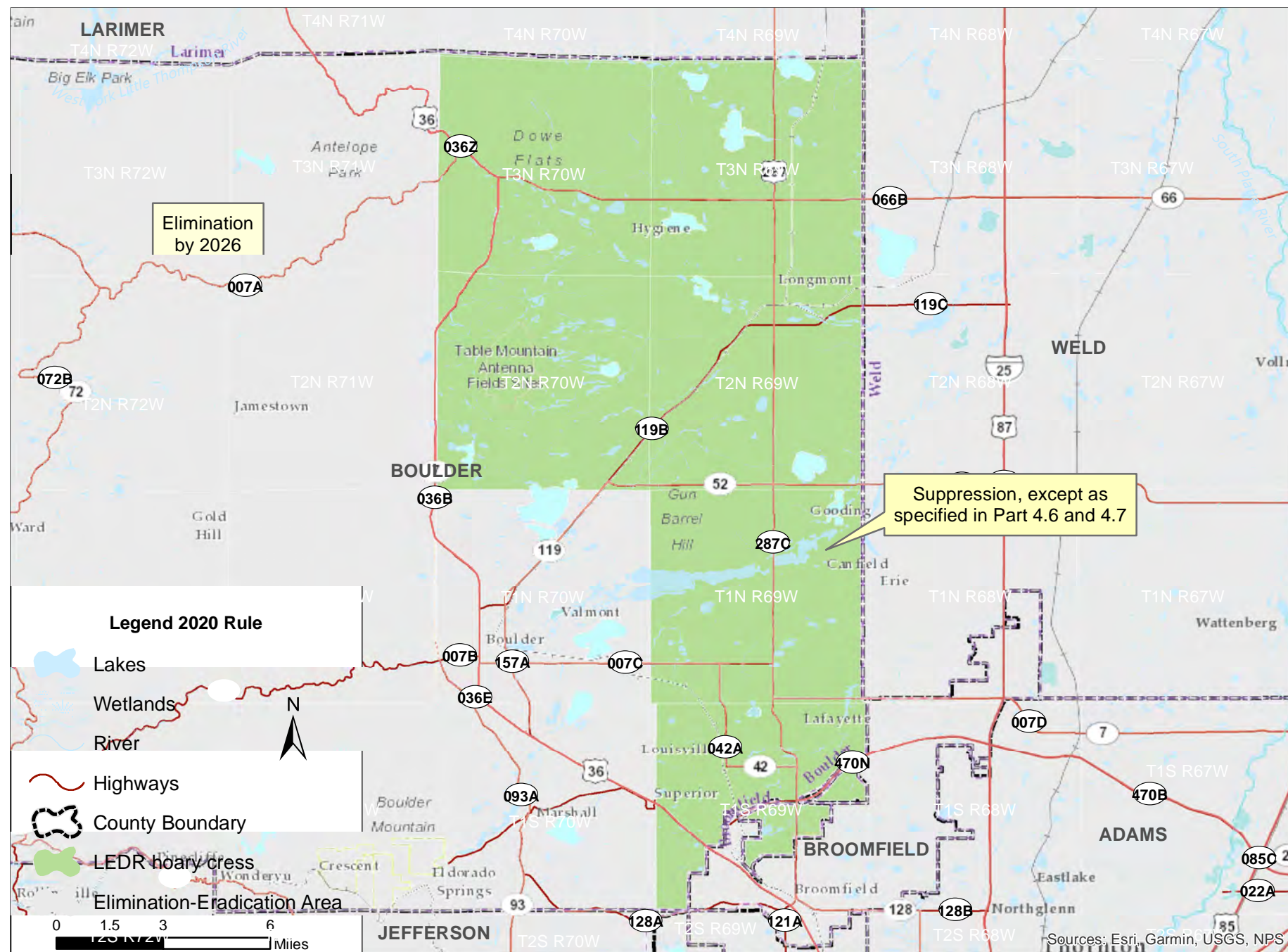




# hoary cress (*Lepidium draba*)

## Boulder County

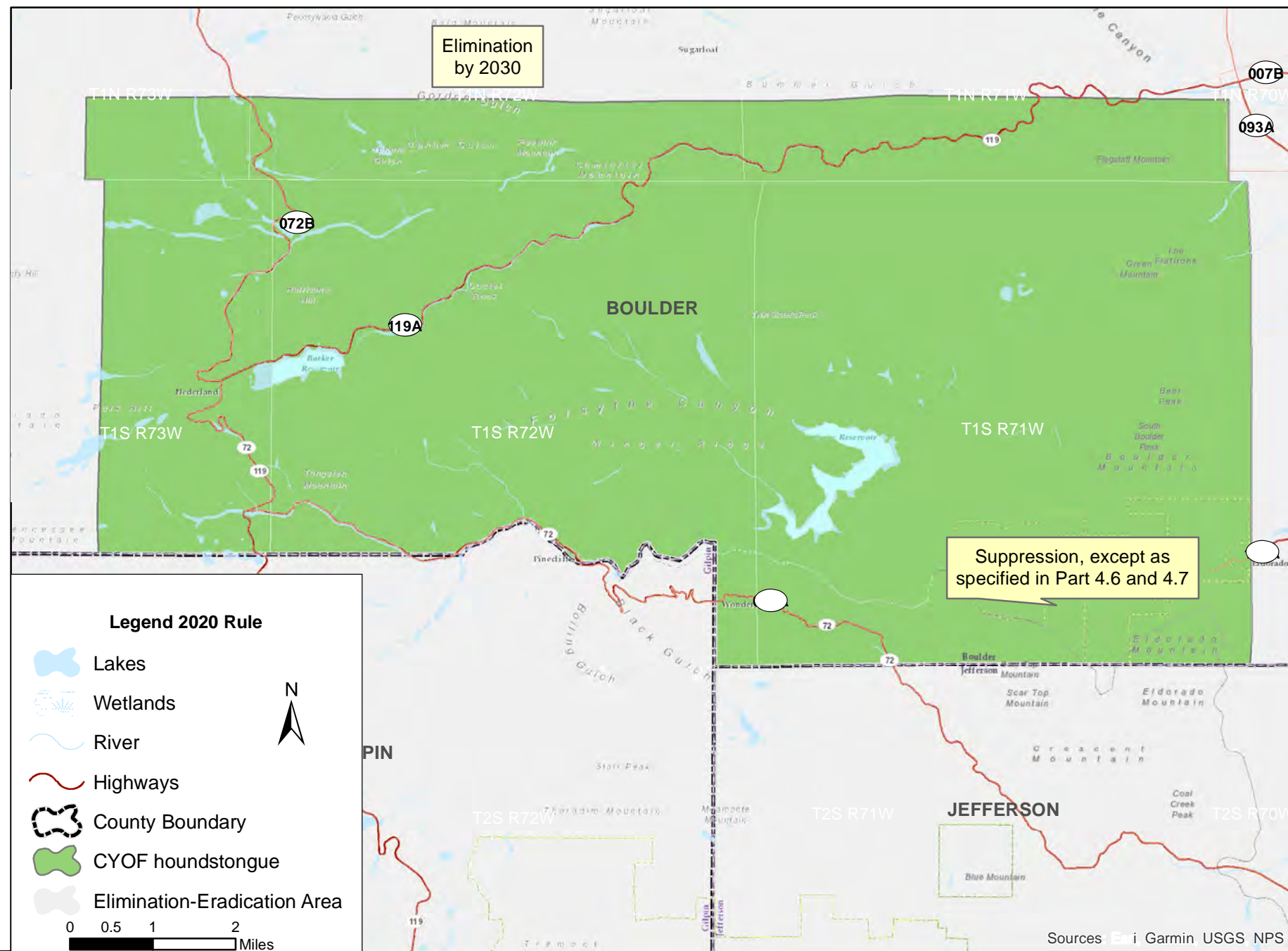
Figure 4.8.16.6



# houndstongue (*Cynoglossum officinale*)

## Boulder County

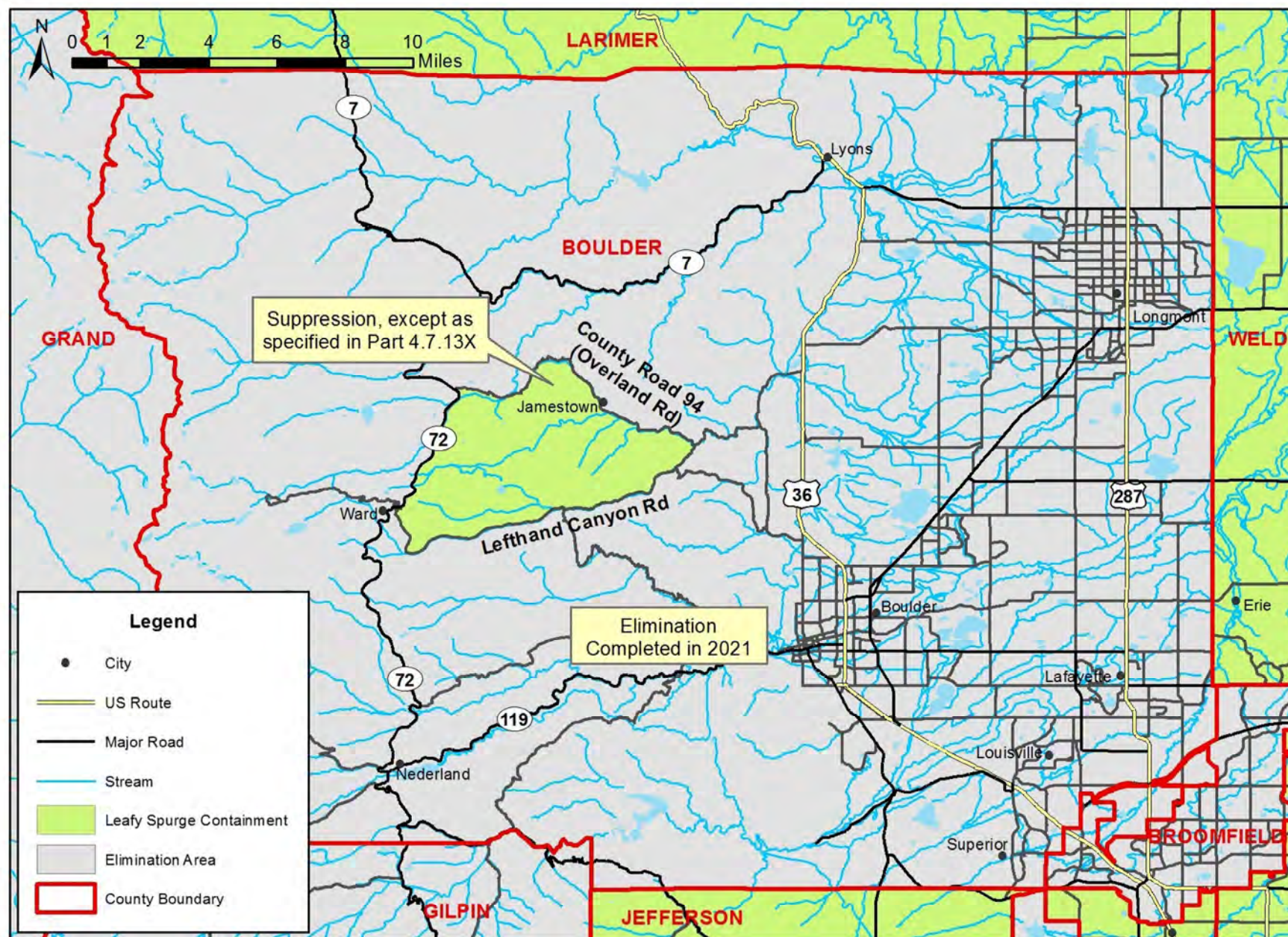
Figure 4.8.10.3





# Leafy Spurge (*Euphorbia esula*) Boulder County

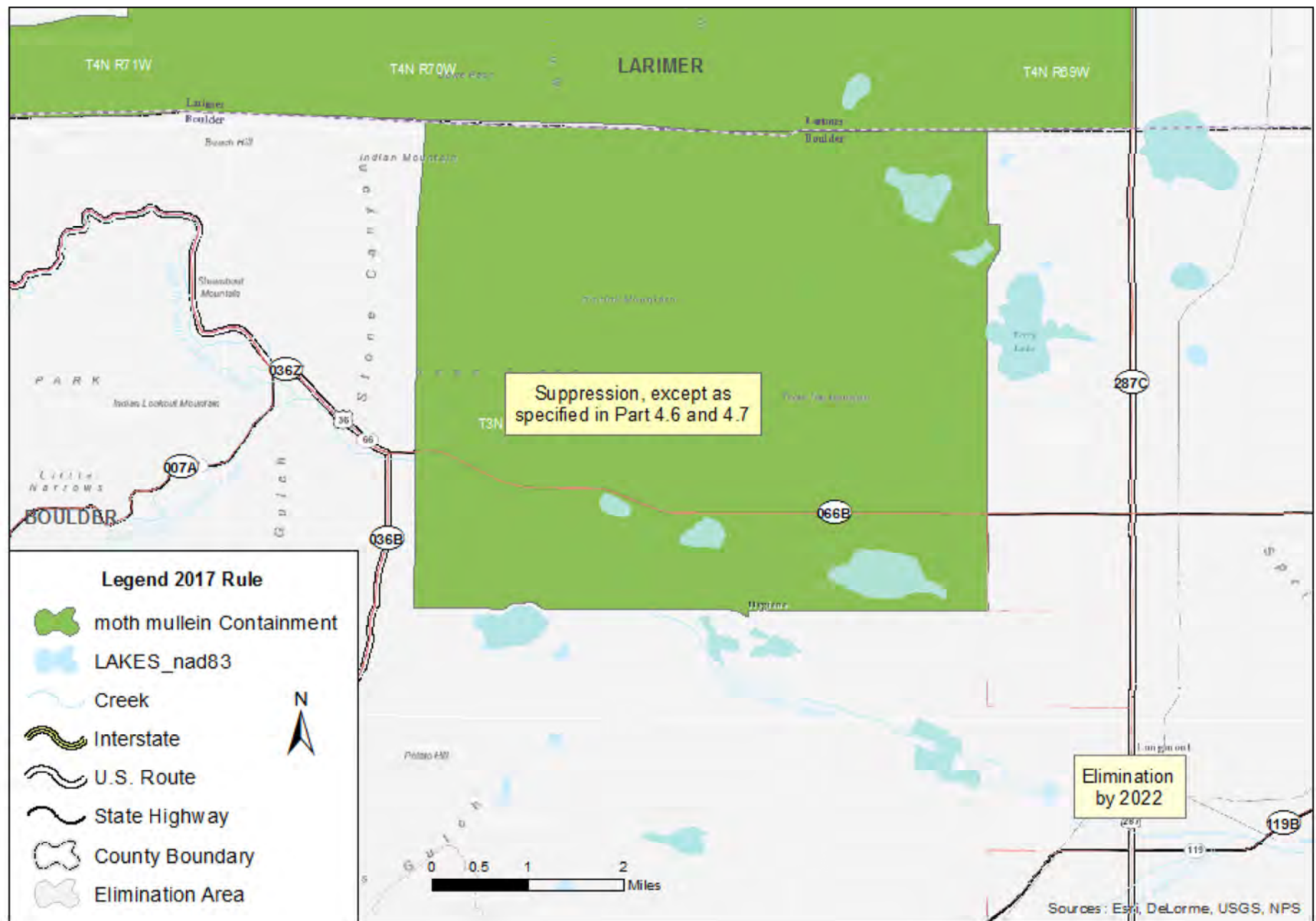
Figure 12.04





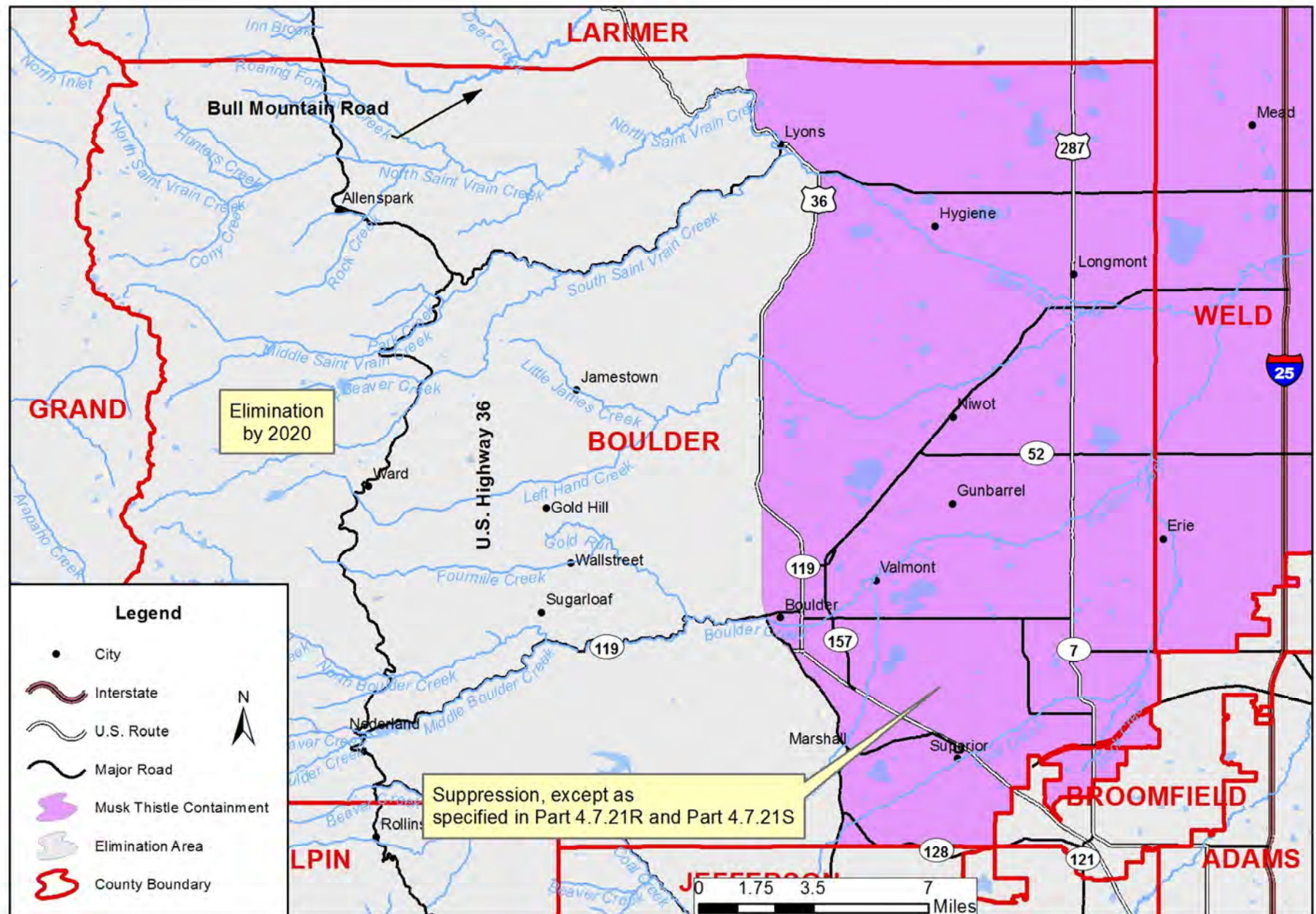
**moth mullein** (*Verbascum blattaria*)  
Boulder County

Figure 4.8.28.2



**Musk Thistle** (*Carduus nutans*)  
Boulder County

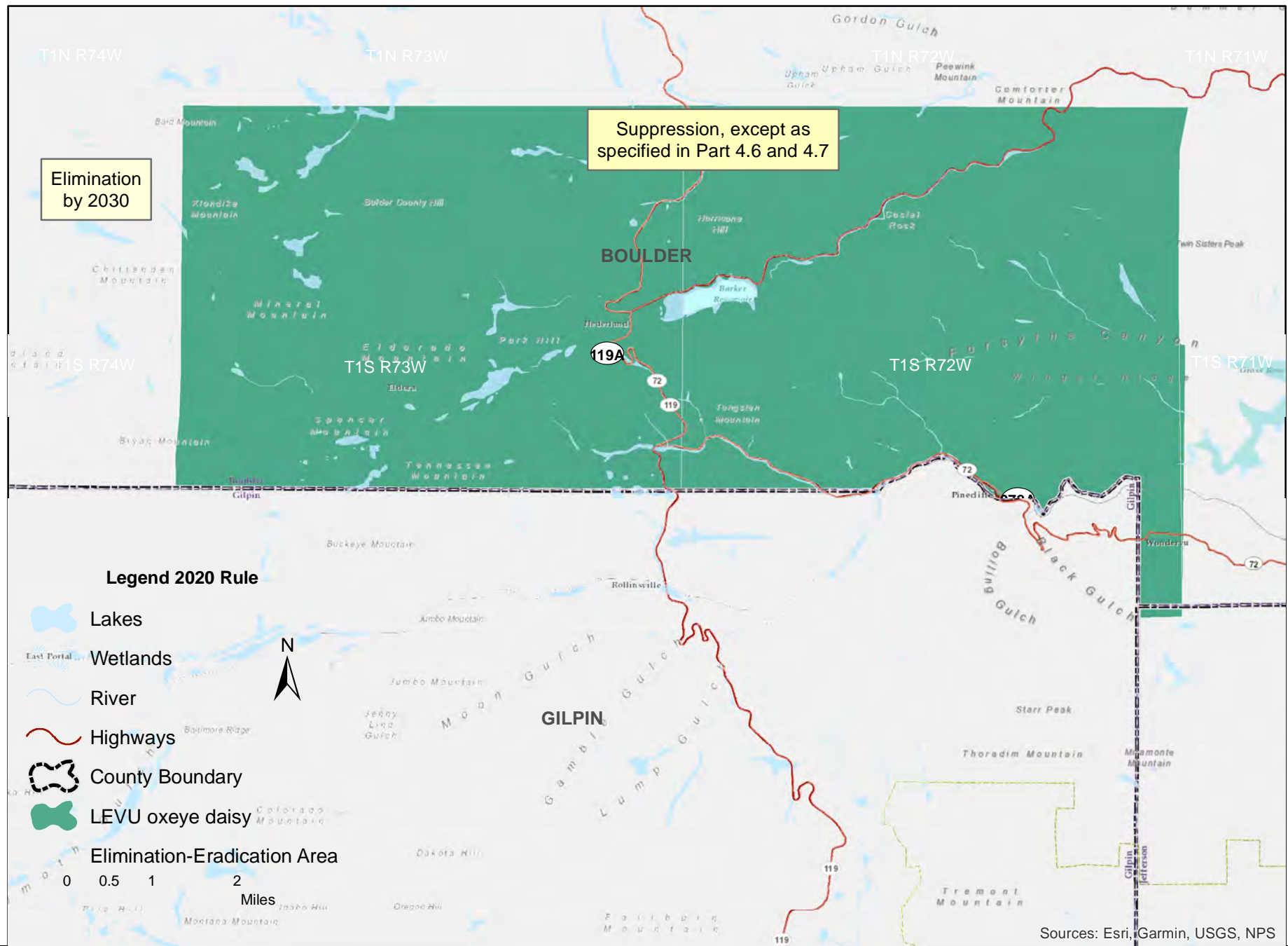
Figure 18.01





**oxeye daisy** (*Leucanthemum vulgare*)  
Boulder County

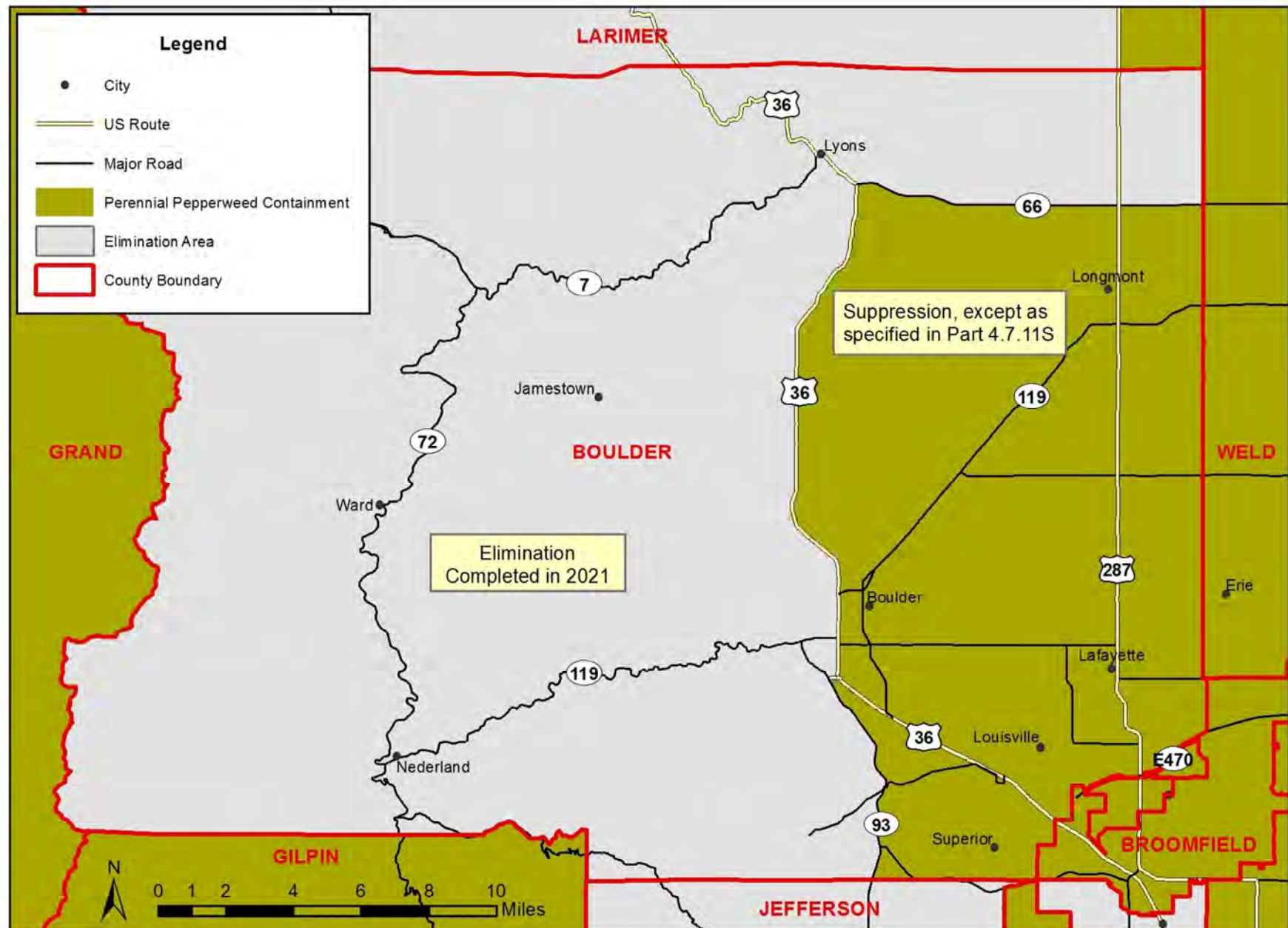
Figure 4.8.8.3



Sources: Esri, Garmin, USGS, NPS

# Perennial Pepperweed (*Lepidium latifolium*) Boulder County

Figure 10.02

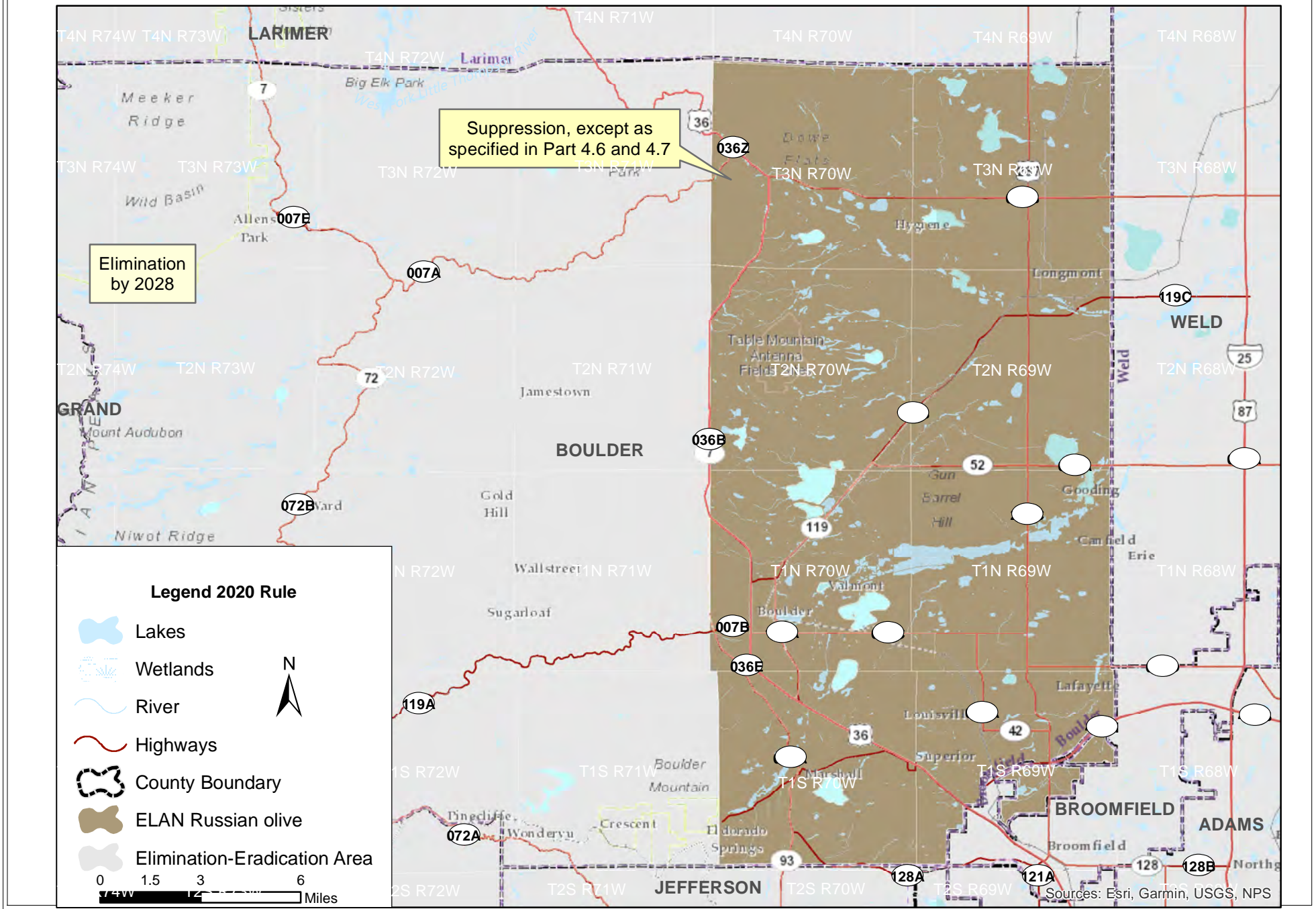




# Russian olive (*Elaeagnus angustifolia*)

## Boulder County

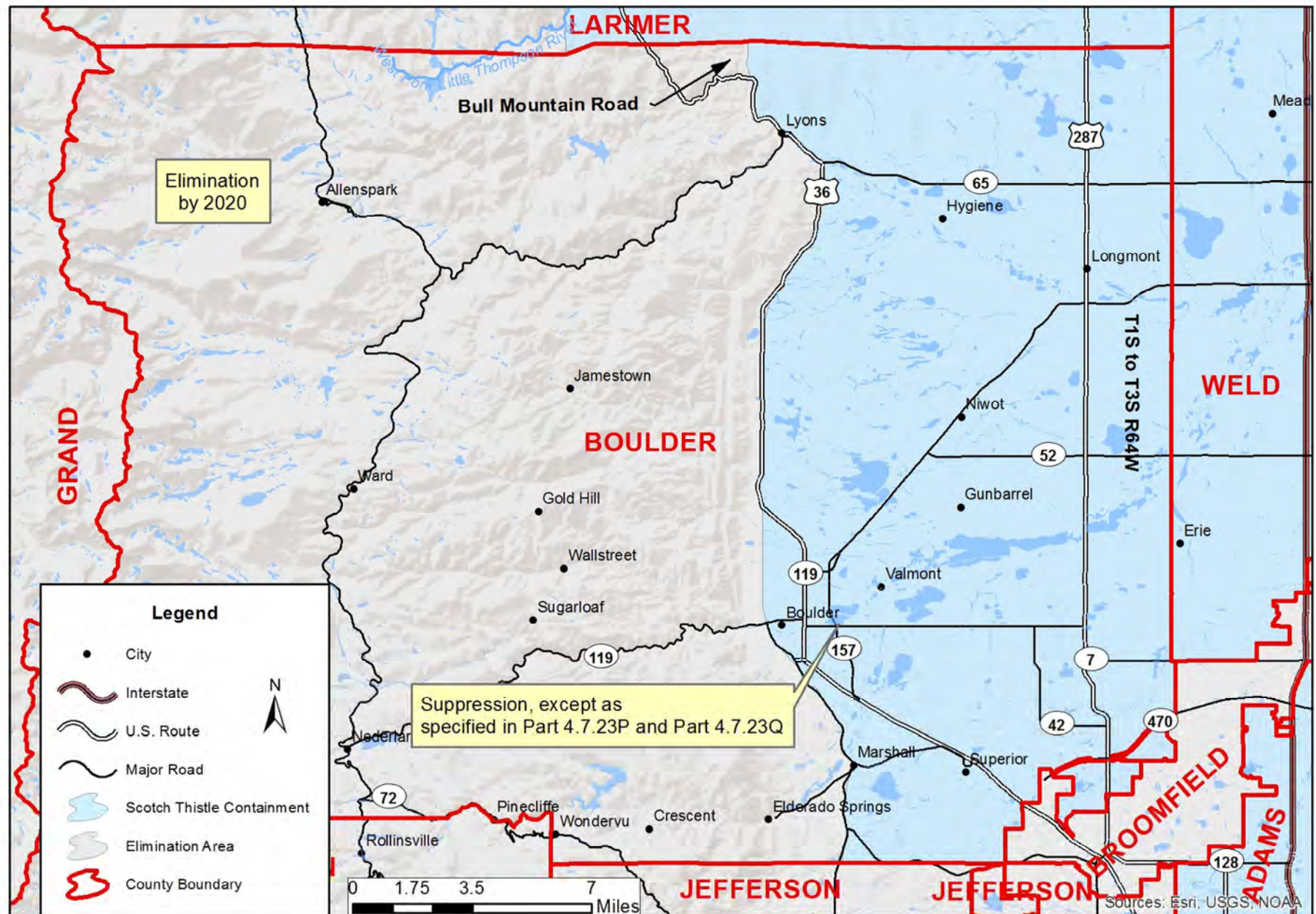
Figure 4.8.35.7





**Scotch Thistle** (*Onopordum acanthium*)  
Boulder County

Figure 20.02



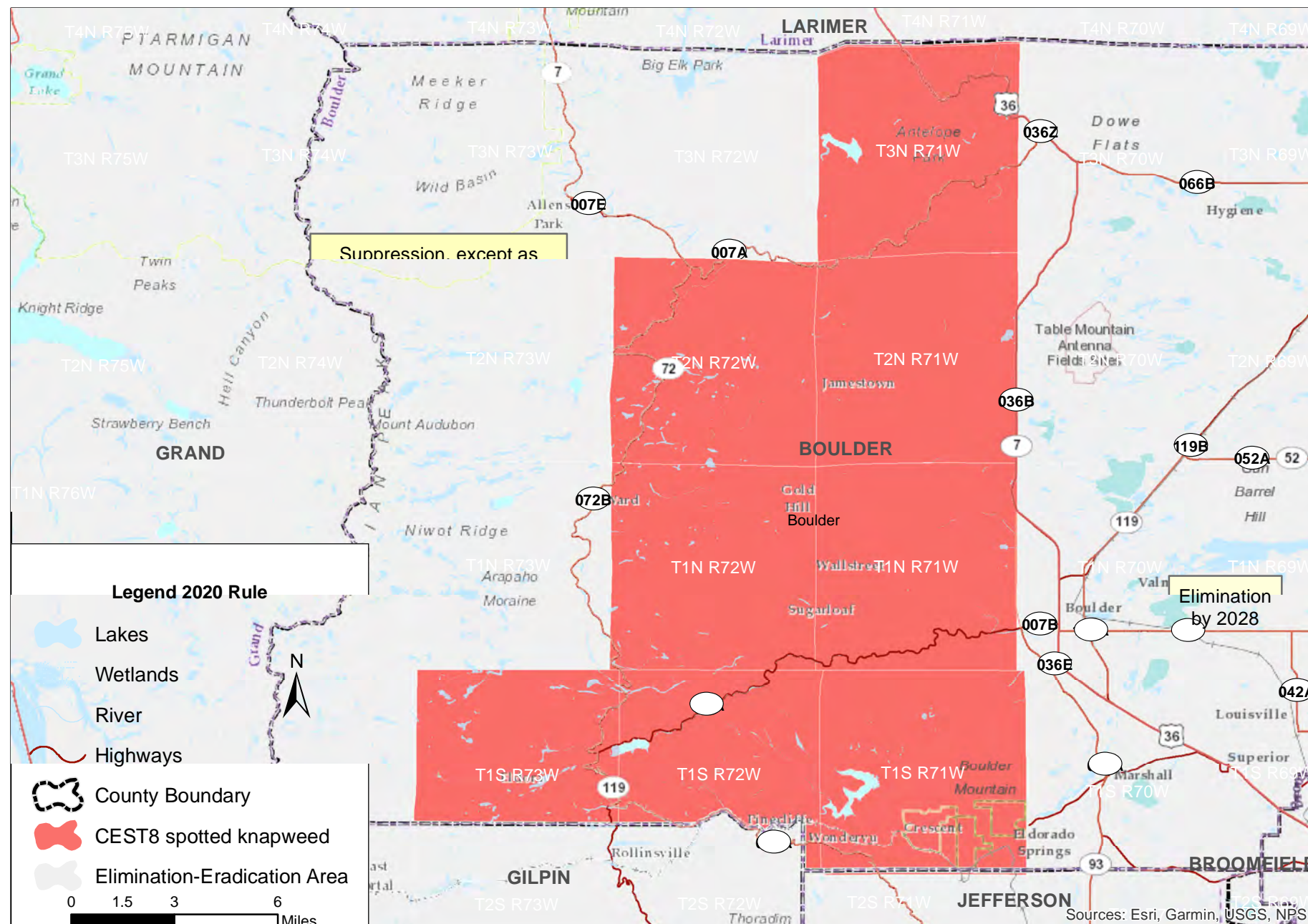


# spotted knapweed and spotted x diffuse knapweed hybrid

Figure 4.8.4.3

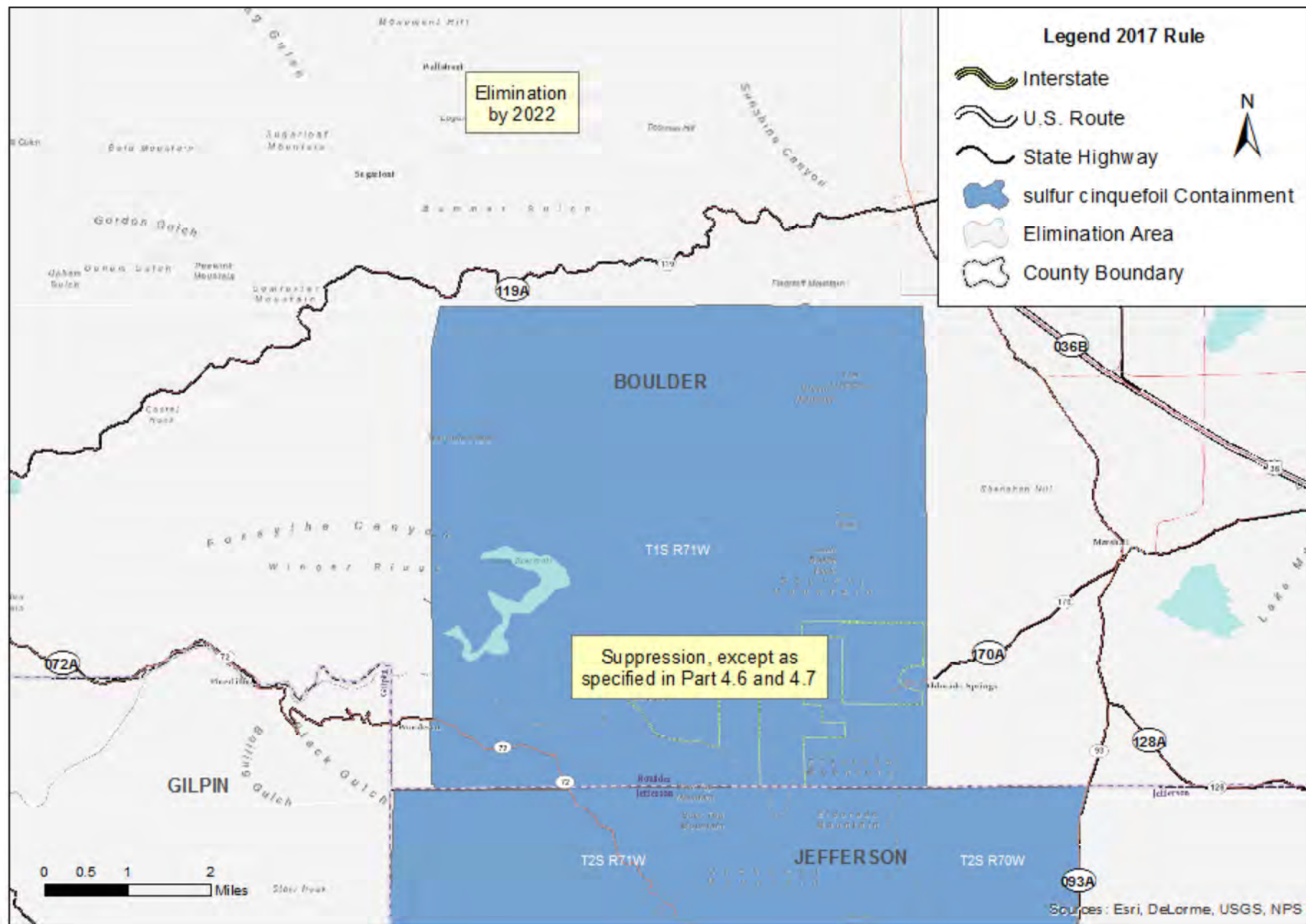
Boulder County

(*Centaurea stoebe* L. ssp. *micranthos*, *Centaurea X psammogena*)



**sulfur cinquefoil** (*Potentilla recta*)  
Boulder County

Figure 4.8.18.2



## Herbicide Selection Protocol

### Integrated Weed Management Plan - Boulder County Parks & Open Space

Boulder County Parks & Open Space (BCPOS) strives to use herbicides that contain active ingredients with the lowest human health and environmental impacts. To determine which herbicides are approved for use, BCPOS will only consider herbicides that are approved by the United States Environmental Protection Agency (US-EPA) and registered by the Colorado Department of Agriculture (CDA) for general use. Then BCPOS will reference the most recent World Health Organizations (WHO) *Recommended Classification of Pesticides by Hazard and Guidelines to Classification* ([Chemical Safety and Health \(who.int\)](https://www.who.int/publications/m/item/recommended-classification-of-pesticides-by-hazard-and-guidelines-to-classification)).

To determine hazard classification, the WHO evaluates 8 different criteria:

Criterion 1: Pesticide formulations that meet the criteria of classes Ia or Ib of the WHO Recommended Classification of Pesticides by Hazard; or

Criterion 2: Pesticide active ingredients and their formulations that meet the criteria of carcinogenicity Categories 1A and 1B of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS); or

Criterion 3: Pesticide active ingredients and their formulations that meet the criteria of mutagenicity Categories 1A and 1B of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS); or

Criterion 4: Pesticide active ingredients and their formulations that meet the criteria of reproductive toxicity Categories 1A and 1B of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS); or

Criterion 5: Pesticide active ingredients listed by the Stockholm Convention in its Annexes A and B, and those meeting all the criteria in paragraph 1 of Annex D of the Convention; or

Criterion 6: Pesticide active ingredients and formulations listed by the Rotterdam Convention in its Annex III; or

Criterion 7: Pesticides listed under the Montreal Protocol; or

Criterion 8: Pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.

Boulder County will approve the use of any herbicides that only contain active ingredients on Table 4 Slightly Hazardous (Class III) technical grade active ingredients in pesticides or Table 5 Technical grade active ingredients of pesticides unlikely to present acute hazard in normal use.

The WHO only evaluates single active ingredients but provides a toolkit that evaluates multiple active ingredients ([Identification of HHPs | Pesticide Registration Toolkit | Food and Agriculture Organization of the United Nations \(fao.org\)](https://www.fao.org/publications/m/item/identification-of-hhps-pesticide-registration-toolkit)). If all the active ingredients in a mixture have been evaluated by the



WHO and those are on Table 4 or Table 5, Boulder County staff will utilize the WHO excel sheet to evaluate the mixture. If the mixture is evaluated to not be considered a Highly Hazardous Pesticide (HHP) by the toolkit it is approved for use.

For any active ingredient that has not been evaluated by the WHO, Boulder County will contract out an evaluation to be done following the guidelines laid out by the WHO and the Food and Agricultural Organization of the United Nations (FOA) ([International Code of Conduct on Pesticide Management. Guidelines on Highly Hazardous Pesticides \(fao.org\)](https://www.fao.org/publications/defaultcard.do?lang=eng&isMultiPage=true&source=0&sourceURL=https://www.fao.org/4/t/06502e/06502e01.htm)). If the evaluation places the active ingredient on Table 4 or table 5 it is approved for use.

Additional resources that discuss the human health and environmental impact that are included on active ingredient list are:

- Cornell University Environment Impact Quotient (EIQ) – Field Use Rating (FUR) Tool
- US-EPA Databases Related to Pesticide Risk Assessment
- Pesticide Toxicity to Bees, NC Dept. of Agriculture and CS Structural Pest Control and Pesticides Division

While these sources are not utilized to make the decision on which active ingredients are approved, they provide valuable information and are used within the treatment plan decision making process.

Boulder County reserves the right to add any new active ingredients without updating the plan if the active ingredients fall under any of the above-mentioned processes.

Boulder County reserves the right to ask for special use instances of herbicides that do not meet the above outline criteria. This will be used in cases of emerging Early Detection Rapid Responses and if resistance is detected within a population of noxious weeds that cannot be addressed with the approved herbicides. For approval for special use the noxious weed staff will put together a proposal that includes why the chemical is needed, where the chemical is needed, proposed size of treatment in acres, timing of application and an explanation on why none of the approved herbicides can be used.

## References

Databases Related to Pesticide Risk Assessment | US EPA

Environmental Impact Quotient – Field Use Rating, Cornell University

<https://cals.cornell.edu/new-york-state-integrated-pest-management/risk-assessment/eiq/eiq-calculator>

## Pesticide Toxicity to Bees “Traffic Light”.

The information in this table was compiled by the NC Dept. of Agriculture and CS, Structural Pest Control and Pesticides Division from the: NC Agricultural Chemicals Manual (2016); WIN-PST tool referenced in USDA NRCS/Xerces Society Agronomy Technical Note #9; EPA list of RT25 data; and Pacific Northwest Extension Publication 591 How to Reduce Bee Poisoning from Pesticides by Hooven, L., Sagili, R., and Johansen, E.

<https://www.ncagr.gov/pollinators/documents/Bee%20Pesticide%20Risk%20Traffic%20Light%203-2-17.pdf>



Active Ingredients Utilized	Signal Word	WHO Hazard Classification Table	Low Rate EIQ-FUR Value	Low Rate EIQ-FUR Rating Impact	High Rate EIQ-FUR Value	High Rate EIQ-FUR Rating Impact	N.Car. Dept. of Ag Toxicity to Bees
aminocyclopyrachlor	Caution	5		N/A		N/A	Relatively nontoxic
aminopyralid	Caution	5	1.8	< 25 very low	4.2	< 25 very low	Relatively nontoxic
chlorsulfuron	Caution	5	0.2	< 25 very low	3.8	< 25 very low	Relatively nontoxic
clopyralid	Caution	4	1.4	< 25 very low	10.1	< 25 very low	Relatively nontoxic
fluroxypyr	Caution	5	4.4	< 25 very low	25.1	< 50 low	Relatively nontoxic
glyphosate	Caution	4	11.6	< 25 very low	46.6	< 50 low	Relatively nontoxic
imazamox	Caution	4	4.9	< 25 very low	19.7	< 25 very low	Relatively nontoxic
imazapic	Caution	4	1.3	< 25 very low	3.9	< 25 very low	Relatively nontoxic
imazapyr	Caution	5	6.5	< 25 very low	38.8	< 50 low	Relatively nontoxic
indaziflam	Caution	Under evaluation	0.7	< 25 very low	1.3	< 25 very low	Relatively nontoxic
metsulfuron methyl	Caution	5	0.1	< 25 very low	1.3	< 25 very low	Relatively nontoxic
prodiamine	Caution	5	3.8	< 25 very low	17.5	< 25 very low	Relatively nontoxic
quinclorac	Caution	4	6.7	< 25 very low	20.1	< 25 very low	Relatively nontoxic
rimsulfuron	Caution	5	0.1	< 25 very low	1	< 25 very low	Relatively nontoxic
sulfentrazone	Caution	Under evaluation	1.2	< 25 very low	3.6	< 25 very low	Relatively nontoxic
topramezone	Caution	Under evaluation	2.1	< 25 very low	8.4	< 25 very low	N/A
flumioxazin	Caution	4	2	< 25 very low	5	< 25 very low	Relatively nontoxic
pyroxasulfone	Caution	Under evaluation	1.3	< 25 very low	3.3	< 25 very low	N/A
diquat dibromide	Caution	Under evaluation	N/A	N/A	N/A	N/A	Relatively nontoxic

# Proposed Aerial Application Policy (Revised 11/28/2023)

Key changes to the October 2023 draft highlighted in text:

- Revised structure and formatting of policy
- Increased the buffer distance from municipal or residential areas from 1/8<sup>th</sup> of a mile to ¼ of a mile for helicopters.
- Refined drone uses and increased buffers.
- Adjusted some buffers concerning riparian and environmentally sensitive areas. This was due to the ability to fly drone equal to or less than 15 in height from the ground.
- Revised Drift Mitigation Measures

## Overview

Boulder County recognizes a need for proposes limited aerial applications on Boulder County Parks & Open Space (BCPOS) natural areas for the control of noxious weeds, primarily cheatgrass. This method is used infrequently but makes it possible to treat inaccessible area and areas with extreme grades. These areas may be unsafe for other application methods. Additionally, aerial applications can efficiently cover large treatment areas. Aerial applications may also be used in emergency treatments for EDRR situations and in large-scale ecological enhancement efforts. All aerial applications are conducted in accordance with EPA approved herbicide product labels. Only herbicide labels with an aerial application citation are used for aerial treatments.

## 1.0 Types of Aerial Application

Two methods of aerial application may be utilized: helicopter or drone. Fixed wing aircraft are not appropriate for aerial applications on BCPOS lands and will not be used.

## 2.0 Aerial Application Utilization

Determinations to utilize aerial application will be based on the following parameters:

- Aerial treatment applications will be conducted in areas identified as mostly inaccessible by motorized ground rig operations or areas where site conditions present safety concerns for a ground-based operation. Examples: no access roads, steep grade, and rocky terrain.
- Only sites located greater than 1/8<sup>th</sup> ¼ of a mile distance from municipality boundaries, and and/or urban or residential areas adjacent to BCPOS lands unless drone technology is being utilized (See drone parameters below).
- Drone technology will be considered for aerial applications in those areas less than ¼ mile distance from municipal boundaries and urban or residential areas adjacent to BCPOS lands identified as mostly inaccessible by motorized ground rig operations and/or unsafe for ground crews.
- Drones may also be used in remote areas for spot application treatments.

## 2.1 Helicopter Application—Why and Where to Use

At distances greater than 1/8<sup>th</sup> ¼ of a mile from municipal boundaries, urban areas or residential areas that are adjacent to BCPOS lands.

Why:

- Can apply to areas inaccessible by motorized ground equipment and unsafe for work crews.
- Very cost effective and efficient for large area treatments.
- Can fly at the lowest height that safely permits uniform coverage of the target area.
- Fly slower than fixed wing aircraft and require less area to turn, minimizing noise and required airspace.
- Capable of very precise application.

Where:

- Only used for applications at a distance greater than 1/4 of a mile from municipal boundaries and urban or residential areas that are adjacent to BCPOS lands.

### 2.1.2 Helicopter: Notification of Application

Notifications for helicopter applications:

- Written notifications will be made to residences within  $\frac{1}{8}$  of a mile of the application boundary, 2 weeks prior to the planned application date.
- All notifications will include purpose of application, target species, and products to be applied.
- Parks will be posted and closed during application.

## 2.2 Drone Application – Why and Where to Use

Why:

- Treating inaccessible, or marginally accessible areas where there would be a risk to equipment or workers.
- Can fly close to the ground, 15 feet or lower depending on vegetation in the area.
- Flight path can be programmed to ensure precise application on precise areas.
- Conducting spot applications in remote areas.
- Drones can be equipped with various sensors to collect different types of data and can be used for early detection rapid response (EDRR) of new noxious weed infestations.

Where:

- Areas within  $\frac{1}{48}$  mile of municipality boundaries, and residential or urban areas that are adjacent to Boulder County Open Space..
- Areas at a distance greater than  $\frac{1}{8}$  of a mile distance from municipality boundaries and urban or residential areas that are adjacent to Boulder County Open Space

### 2.2.1 Drone: Notification of Application

Notifications for drone applications will be posted on the daily herbicide application website.

## 3.0 Aerial Buffers

Application buffers are sometimes specified on product labels. Boulder County's proposed buffers are generally more conservative than product label requirements if provided:

- Helicopters:
  - 150-foot buffers 100 feet from the Parks & Open Space property boundaries.

- If adjacent landowner requests or agrees to a reduction of the aerial buffer distance, it may be reduced to the property line or some distance less than 150 feet with written agreement of adjacent landowner.
  - 100-foot buffers from the transition line of riparian areas into terrestrial areas next to open water.
  - 50-foot buffers from sensitive areas such as waterways and/or critical habitats.
- Drones:
    - 25-50-foot buffers from the Parks & Open Space property boundaries.
    - 100-foot buffers from the Parks & Open Space property boundaries for areas located within  $\frac{1}{4}$ -mile of municipality boundaries and urban or residential areas that are adjacent to BCPOS lands due to application height less than 15 feet.
    - 50-foot buffers from the transition line of riparian areas into terrestrial areas next to open water.
    - If adjacent landowner requests or agrees to a reduction of the aerial buffer distance, it may be reduced to the property line or some distance less than 25-50 or 100 feet with written agreement of adjacent landowner.
    - 25-foot buffers from sensitive areas such as waterways and/or critical habitats.

#### 4.0 Drift Mitigation Measures for Helicopters and Drones:

Drift mitigation measures include:

- Follow all label requirements for drift mitigation.
- On site weather monitoring.
- No treatment during inversions.
- No treatment when winds exceed herbicide label requirements.
- No treatment when weather forecasts predict rain in subsequent 24 hours.
- Boulder County will initiate drift monitoring protocols for aerial applications.



Photo demonstrates the treatment line of a typical helicopter application.

### Weed Management Tool Costs

Type	Method	Cost/100 Acres - Low(1)	Cost/100 Acres - High(2)
n/a	Monitoring	\$ 1,406.50	\$ 4,019.50
<b>Spot</b>	Manual (hand pull or dig) (3)	\$ 4,019.50	\$ 10,552.00
<b>Spot</b>	Weed Whacking (3)	\$ 2,713.00	\$ 9,245.50
<b>Spot</b>	Back Pack	\$ 4,813.00	\$ 20,152.00
<b>Broadcast</b>	Field Mowing(3)	\$ 3,799.20	\$ 6,412.50
<b>Broadcast</b>	Tractor Spraying	\$ 4,359.37	\$ 15,593.00
<b>Broadcast</b>	Aerial Spraying - Contract	\$ 3,800.00	\$ 11,300.00
<b>Broadcast</b>	Goats - Contract (4)	\$ 103,900.00	\$ 1,285.00

#### NOTES:

(1) Low cost influences: less dense infestation, ease of access for equipment (flat, not rocky), and lower cost herbicide

(2) High cost influences: more dense infestation, difficult access (steep, obstacles, rocky), higher cost herbicide

(3) Will likely require repeat treatments each season

(4) Avg, cost from Lyons \$1285/ac, Louisville \$1039/ac.

