



Boulder County Integrated Weed Management Plan





Tonight's presentation

- Process to date and staff response to input
- What's next
- Integrated Weed Management role in ecosystem health
- Illustrative case studies
- Proposed IWM policies

Process to date:

3 POSAC presentations

3 field trips

Current Process:

- Public input 9/29-10/18
- IWM Plan, Story Map, online survey on webpage
- Open House, Oct. 11
- BOCC Field Trip, Oct. 13
- POSAC Hearing, Dec. 5
- BOCC Hearings
 - Jan. 23
 - Feb. 15





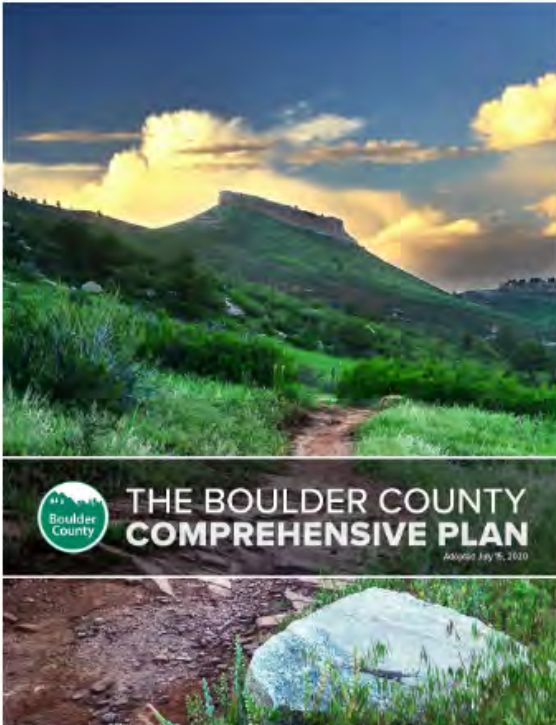
What We've Heard:


- Herbicides!
- Range of tools, effectiveness
- Treatment decision process
- Cheat grass ecology, fire danger

Response to Input

- Objective and Strategies
- Details about adaptive implementation decision process
- Details about herbicide use and toxicity (Appendices D & E)
- Proposed Aerial Spray Policy: buffers, notification (Appendix F)





The Boulder County Comprehensive Plan (BCCP)  was developed to respond to the widely accepted principle that the myriad of future land use decisions affecting the county's lands should be made in a coordinated and responsible manner.

The BCCP philosophy is that:

- Growth should be channeled to municipalities.
- Agricultural lands should be protected.
- Preservation of our environmental and natural resources should be a high priority in making land use decisions.

High Biodiversity Areas

An area with a concentration of rare environmental resources that represents one of the greatest opportunities for preserving specific aspects of Boulder County's natural heritage. These areas have been identified and ranked by the CSU Natural Heritage Program.

B1: Outstanding Biodiversity Significance (Irreplaceable)

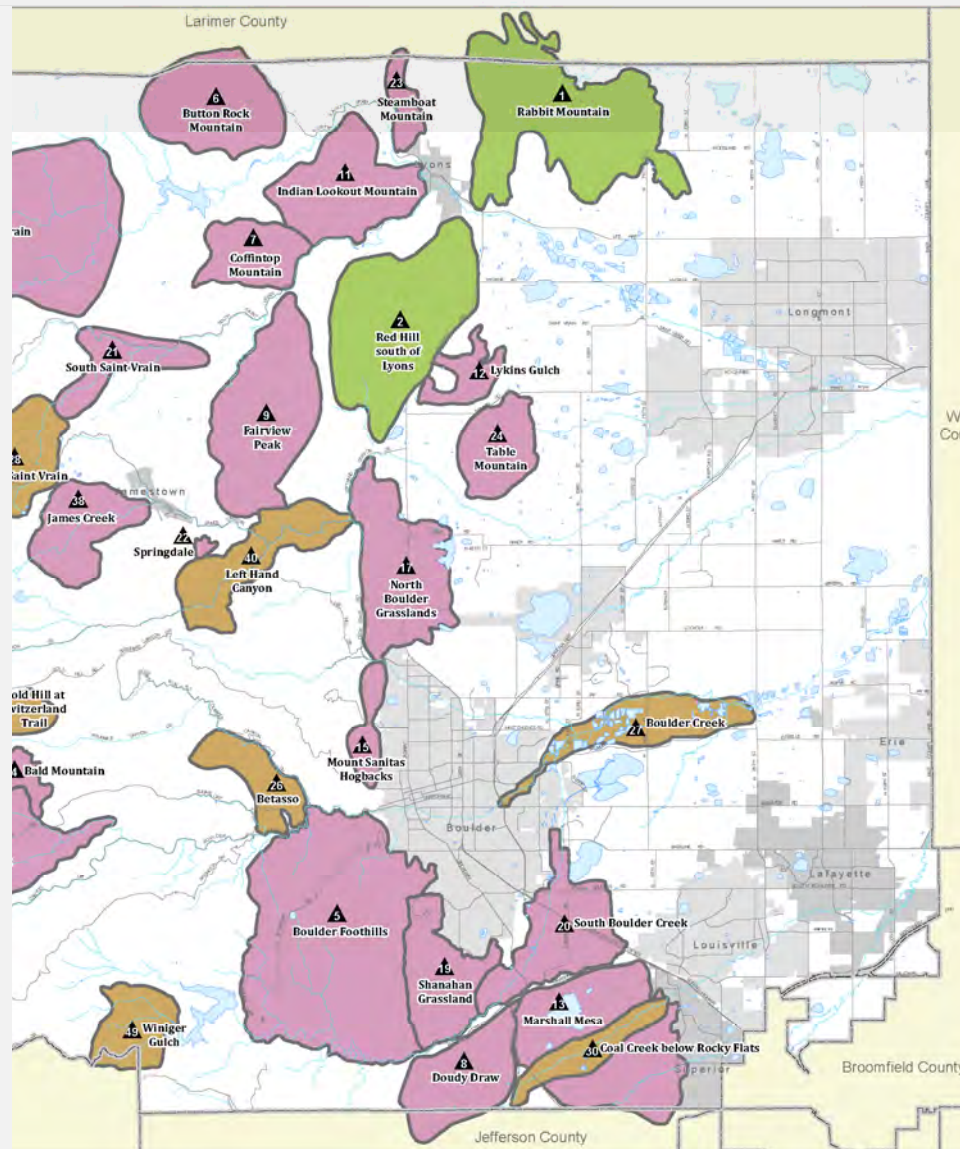


An area that on a global scale is irreplaceable. The area has a concentration of four or more globally critically imperiled to globally imperiled (G1-G2) element occurrences that are in excellent or good (A- or B-ranked) condition.

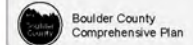
B2: Very High Biodiversity Significance (Nearly Irreplaceable)



An area that on a global scale is nearly irreplaceable and significance on a national scale. An area has a concentration of several biodiversity elements that are globally rare (G3) and/or species that are common globally (G4 or G5) but rare within Colorado.



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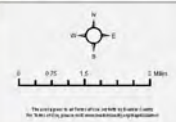
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B3: High Biodiversity Significance

An area that has state-wide importance. The area has a concentration of several biodiversity elements that are more common globally but are excellent or good for this county.

Adopted October 15, 2014
Planning Commission



Critical Wildlife Habitats and Migration Corridors
Environmental Resources Element

Critical Wildlife Habitats



31
An area of unique habitat which has a crucial role in sustaining populations of native wildlife and in perpetuating and encouraging a diversity of native species in the county. The area may be significantly productive habitat or particularly vital to the life requirements of species that are critically imperiled or vulnerable to extirpation.

Wildlife Migration Corridors

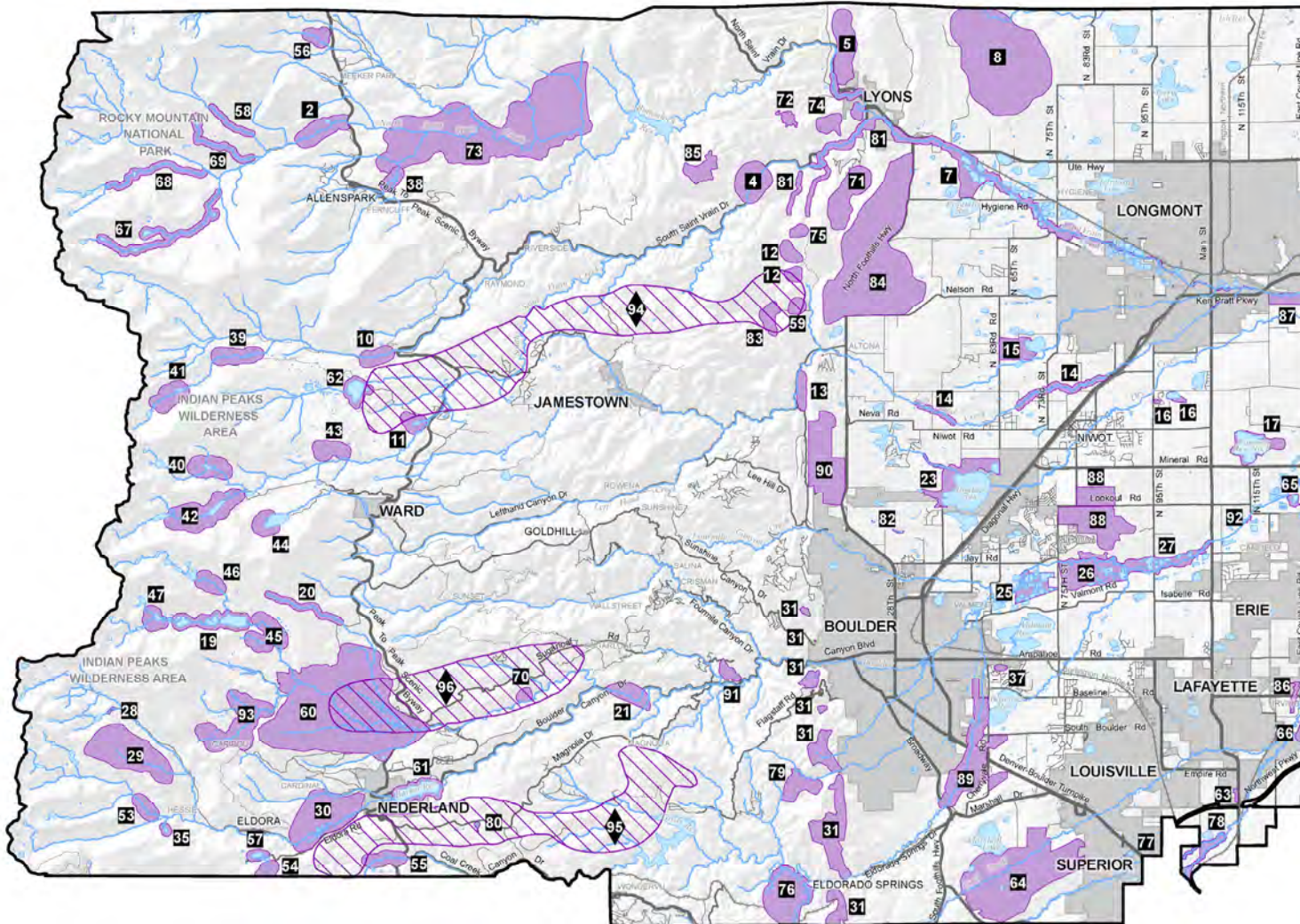


94
A specific, delineated area of known elk migration movement for a major elk herd in Boulder County

Note: Map scale and reproduction method limit precision in physical features and boundary locations.

Adopted Dec. 14, 2022
Planning Commission
Printed 2/8/2023

Boulder County
1" = 2.5 miles
1:158,400
North
Comprehensive Plan Map



Zone 1 Mouse Management Area (MMA)



Areas in which PMJM is known to occur, including adjacent habitat patches that are likely to be occupied. Management should emphasize maintaining higher quality riparian habitat and higher numbers of mice. Areas of poor quality are priorities for restoration with high expectations for success.

Zone 2 Possible Linkages



Linkages are designated for populations that once occurred as a single unit, but are now fragmented. Linkages provide adequate structure for a few mice to "make it to the other side", facilitating dispersal, population maintenance, and genetic exchange.

Zone 3 Suitable Contiguous Habitat



Areas of suitable habitat that are contiguous to a known population and are not known to be occupied by PMJM (i.e. PMJM either have not been captured or no trapping has occurred).

Zone 4 Potential Restoration, Contiguous



Areas not known to be occupied but contiguous with known populations where restoration of unsuitable or degraded habitat could result in a significant increase in a PMJM population.

Zone 5 Suitable, Noncontiguous Habitat

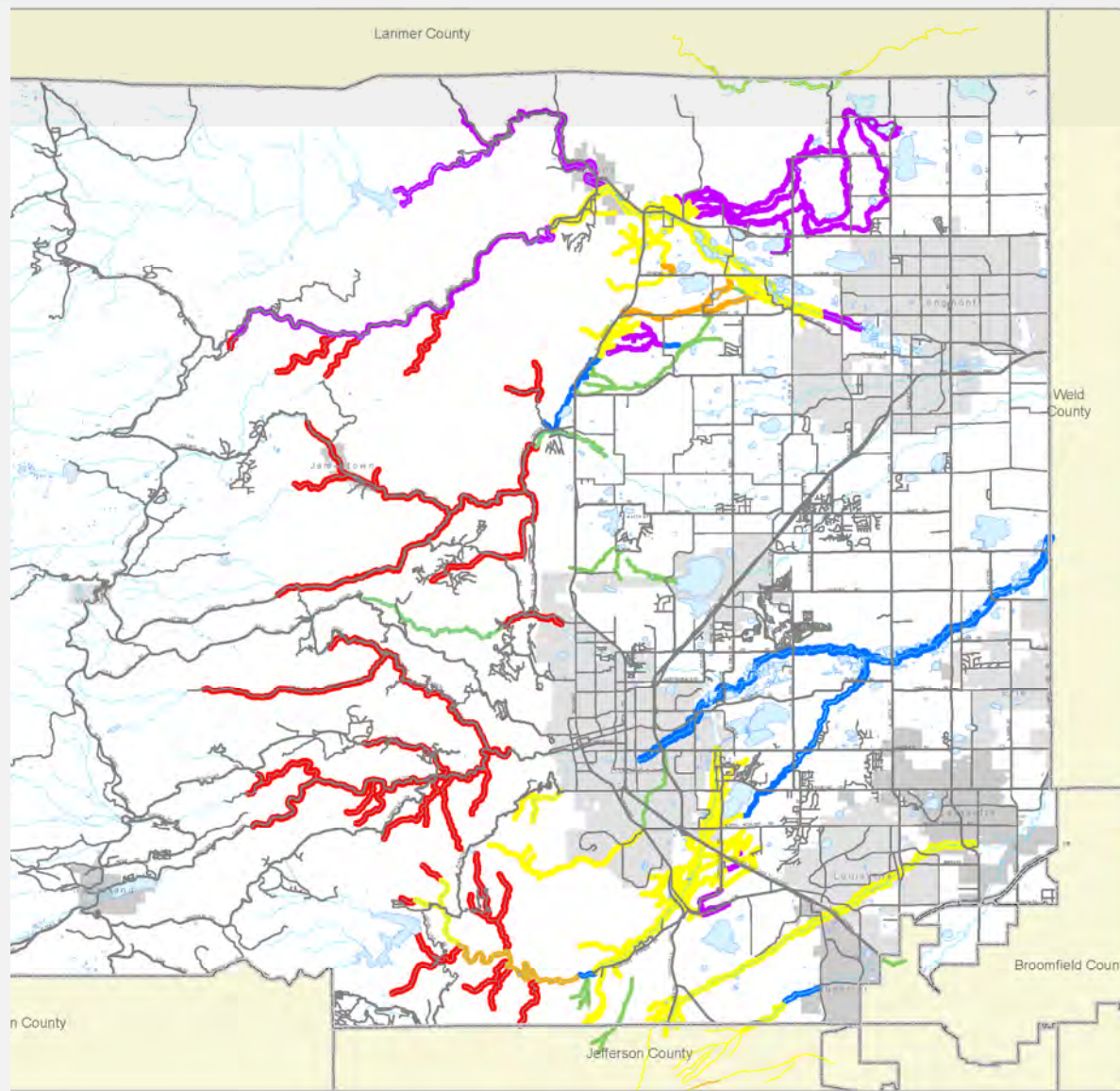


Areas of suitable habitat that are NOT contiguous to a known population and are not known to be occupied by PMJM.

Foothills Perennial Stream Habitat



Areas of suitable PMJM habitat along foothills perennial streams up to 7,600 ft. in elevation not covered under one of the other designations. PMJM are known to occupy riparian habitat up to this elevation (USFWS 2004).



Habitat Conservation Areas for Prebles Meadow Jumping Mouse



Boulder County Comprehensive Plan

Habitat Conservation Areas Descriptions
Habitat Conservation Areas are adapted from the "Possible Conservation Zones" of the PMJM Conservation Handbook. The designations guide conservation of PMJM habitat with the overarching goal of aiding in the recovery of this Threatened species.

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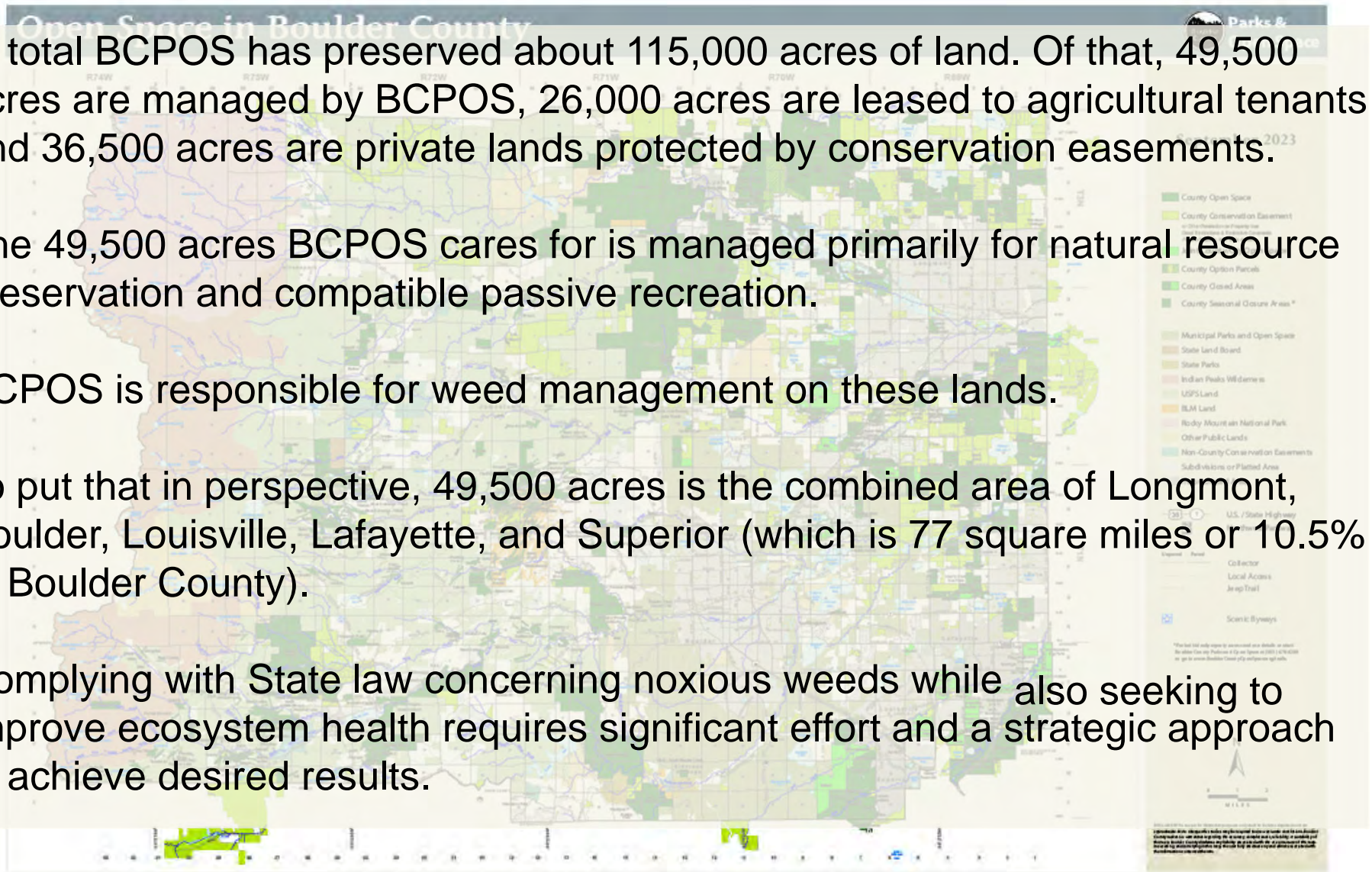
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Revisions Adopted July 15, 2015
Planning Commission



- In total BCPOS has preserved about 115,000 acres of land. Of that, 49,500 acres are managed by BCPOS, 26,000 acres are leased to agricultural tenants and 36,500 acres are private lands protected by conservation easements.
- The 49,500 acres BCPOS cares for is managed primarily for natural resource preservation and compatible passive recreation.
- BCPOS is responsible for weed management on these lands.
- To put that in perspective, 49,500 acres is the combined area of Longmont, Boulder, Louisville, Lafayette, and Superior (which is 77 square miles or 10.5% of Boulder County).
- Complying with State law concerning noxious weeds while also seeking to improve ecosystem health requires significant effort and a strategic approach to achieve desired results.



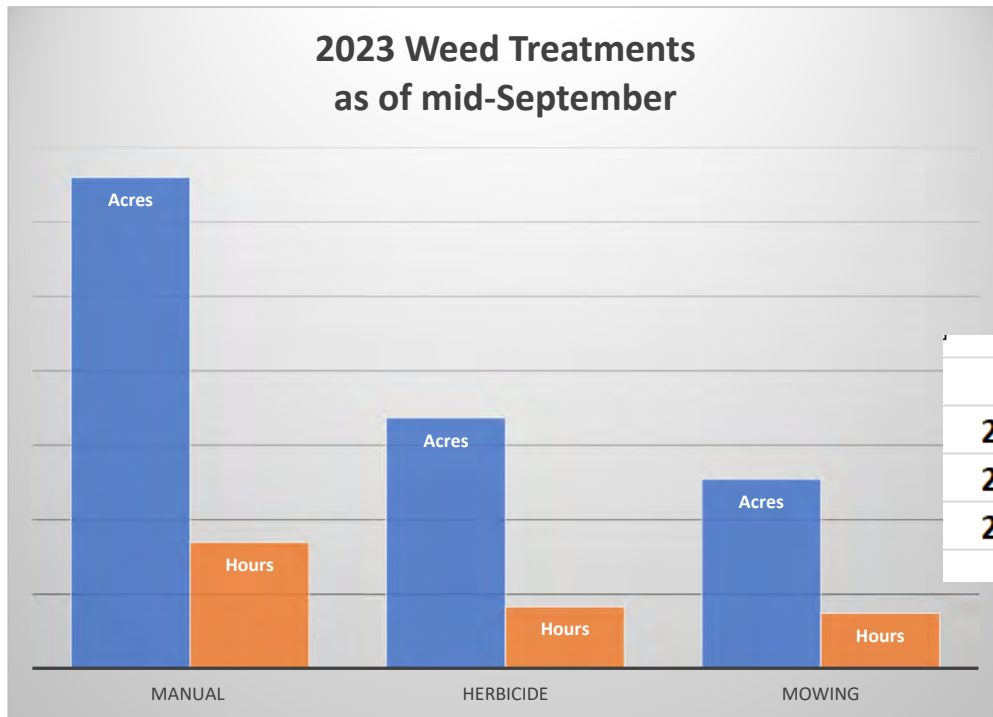
Open Space Objective: to reset conditions on impacted lands in support of native ecosystem recovery.



Before IMWP actions – cheatgrass dominated with few natives (December 2017).

After IWMP actions – significant increase in native plant coverage and diversity (Spring 2021)

Allocation of Weed Treatment Effort



Acres: 3250
Hours: 750

Acres: 1680
Hours: 330

Acres: 1270
Hours: 350

Scouting

Acres: 1,600
Hours: 160

Tree Treatments

Acres: 1,100
Hours: 300

2023 TOTALS (as of 9/14/2023)

Hours: 2,000

	Manual	Mow	Herbicide	Tree	Total Area	Scout
2023	3240	1270	1680	1060	7250	1630
2022	1990	400	3800	120	6310	1180
2021	3080	890	2790	20	6780	1710

ANNUAL PROGRAM COSTS	
Full time staff (4)	\$ 457,500
11 Seasonal staff (3/4 time)	\$ 448,391
Operating budget	\$ 111,000
Capital funding (3 yr avg)	\$ 62,000
	\$ 1,078,891

1.4 Integrated Weed Management Objective and Strategies

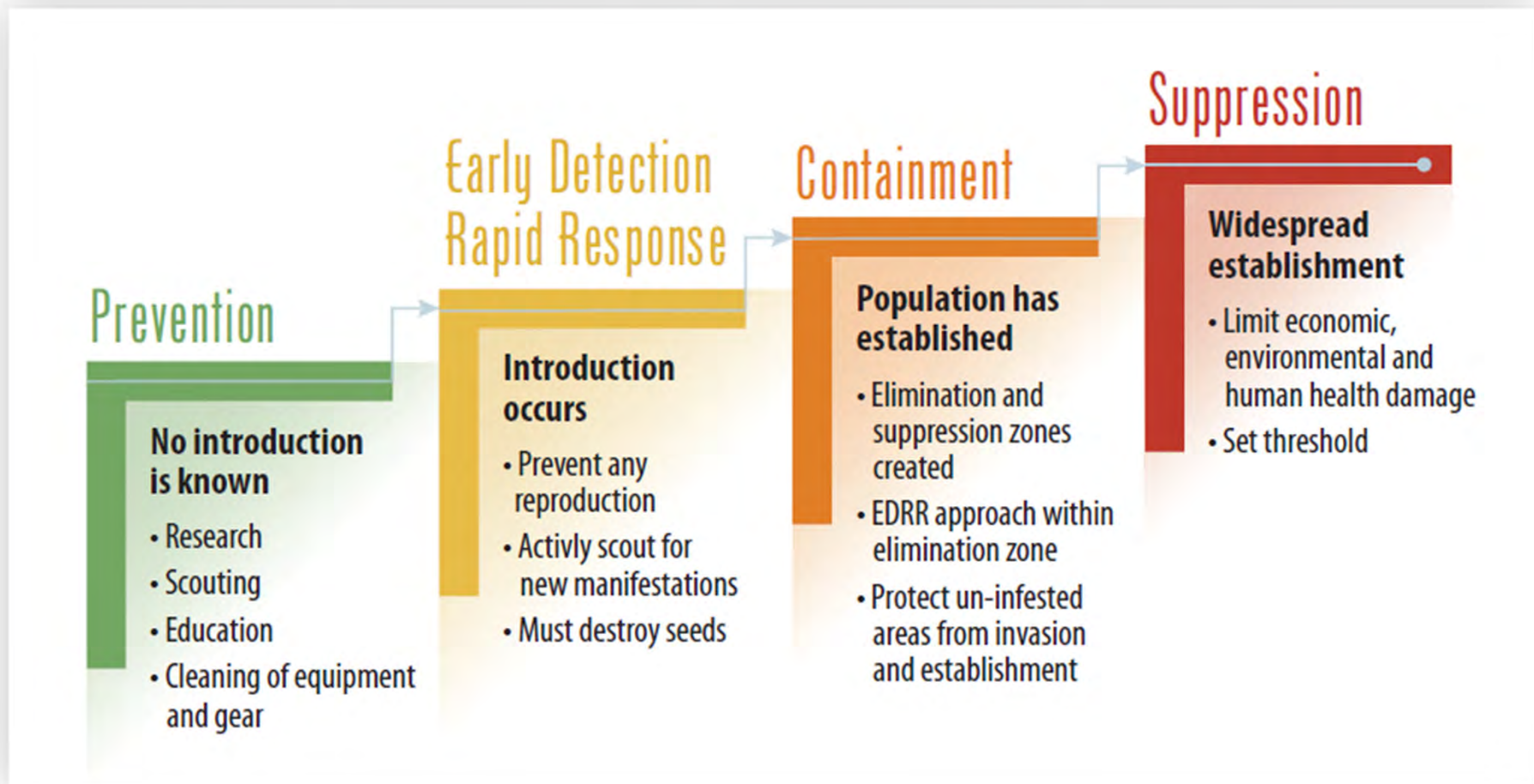
Integrated Weed Management Objective

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

Strategies

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

Figure 1: Decision Model for Early Detection and Rapid Response



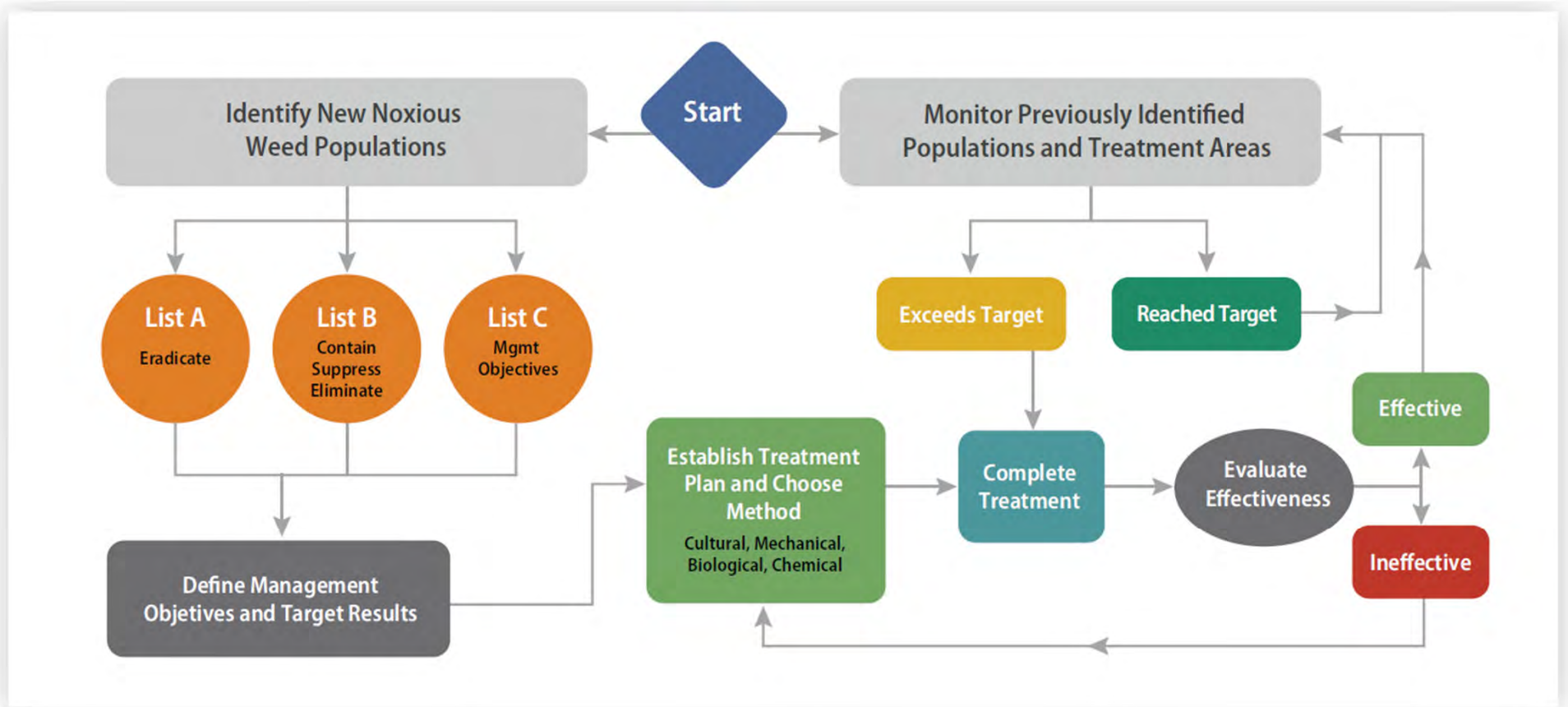
CASE STUDY / FIELD TRIP

Monarch

Integrated approach to rehabilitation of severely degraded lands



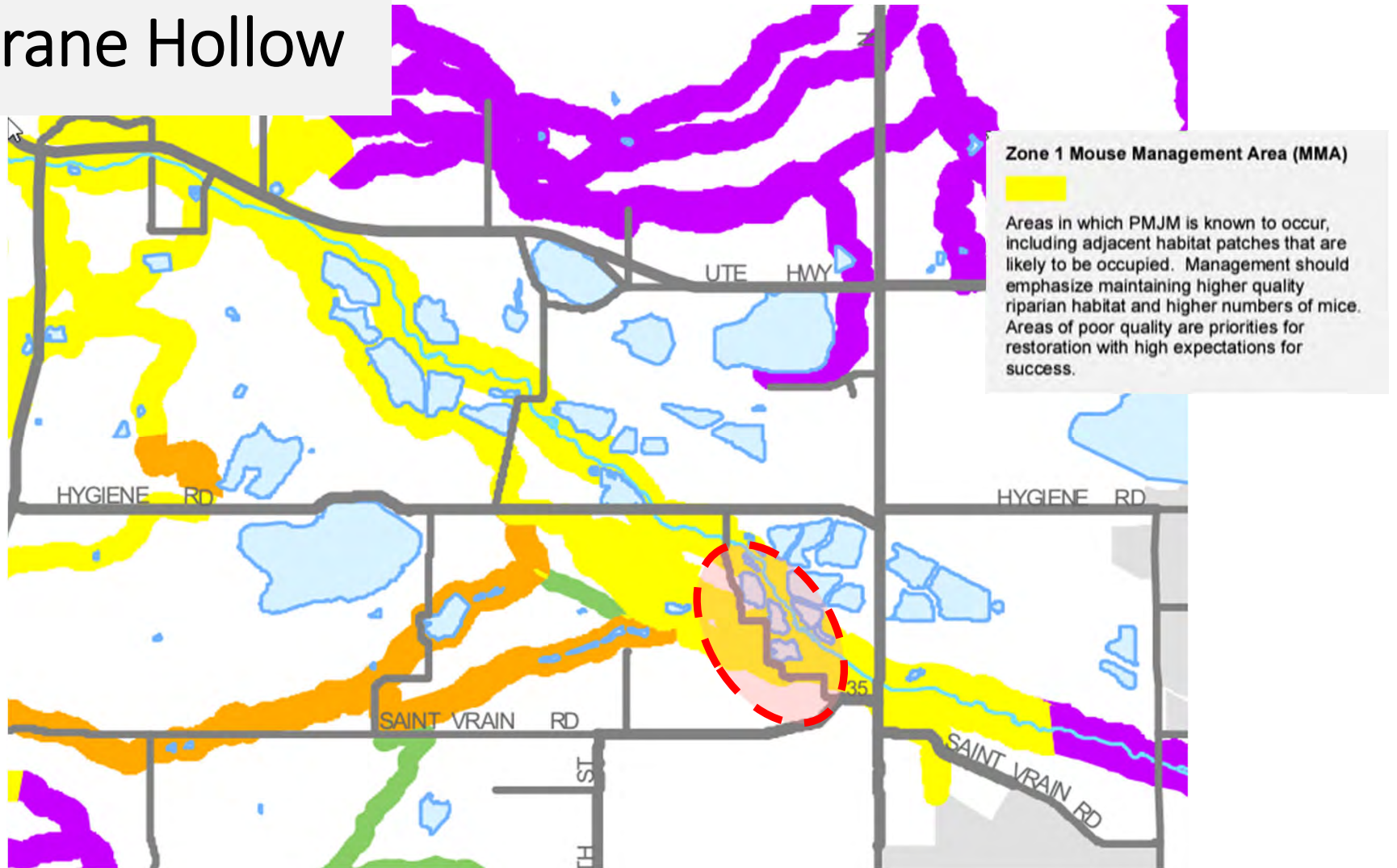
Fig. 2 Adaptive IWM Decision Model



Pella/Crane Hollow



Pella/Crane Hollow



Pella – Crane Hollow

Adaptive IWM Decision Model

- Open Space Values : Critical Wildlife Habitat (Preble's Habitat, Heron Rookery)
- Noxious Weed Populations:
 - Harry Willow Herb, List A
 - Canada Thistle, List B
 - Russian Olive, List B
 - Common Teasel, List C
- Management Objectives: Restore PMJM habitat by eliminating Thistle and Teasel; increase treatment area and decrease herbicide use over time
- Constraint: heron rookery and Preble's limit time area can be accessed for treatment
- Treatment Tools: Mowing, chemical
- Available capacity/timing: 2 crew days per year in Fall



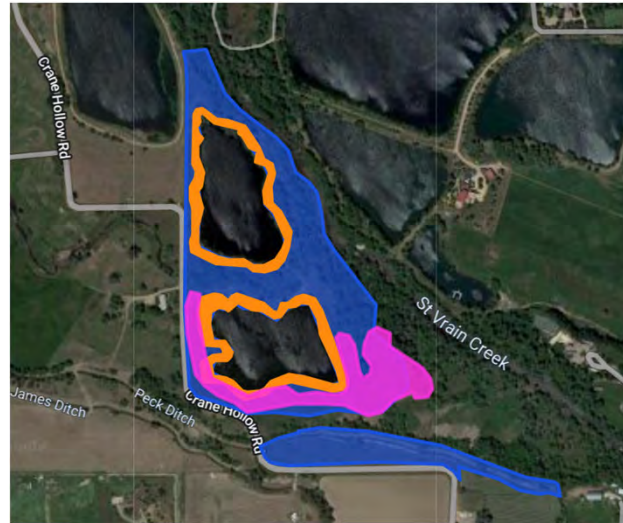
2019 and 2020

BLUE: 11 acre treatment area
Treated 3 acres or 27% of area treated

2020

BLUE: Return to 11 acre treatment area. Weed whipped area to reduce plant surface area
Treated 2 acres of herbicide.
18% of area treated.

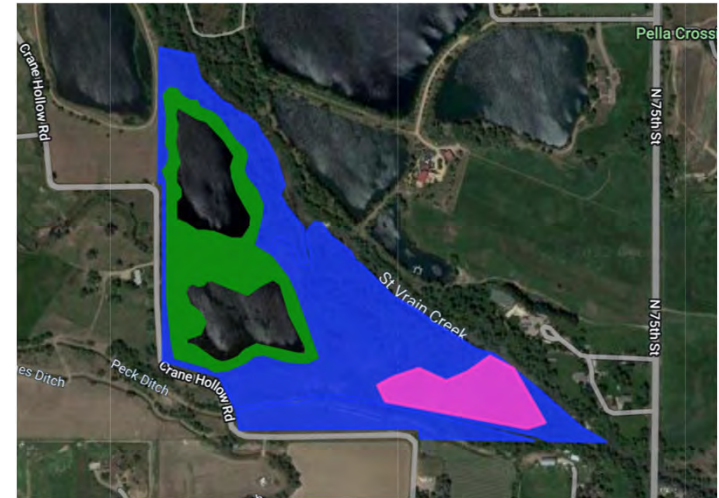
ORANGE: Hairy Willow herb (List A) also treated



2021

BLUE: Expanded treatment area of 30.5 acres
PINK: Mowed and weed whipped 4.7 acres
Applied 4.102 acres of herbicide across 30.5 acres
13% of total area treated.

ORANGE: Expanded List A treatment area



2022

BLUE: Expanded treatment area to 34.5 acres
PINK: Weed whipped 4.2 acres
Applied 3.31 acres of herbicide
10% of area treated

List A eliminated.

GREEN: Added Russian Olive (List B) removal/stump treatment. Applied 0.008 acres of herbicide to 7.9 acre treatment area.
0.1% of area treated

2023

Plan to return for two days of work addressing most pressing need and weather permitting.






Search Google Maps



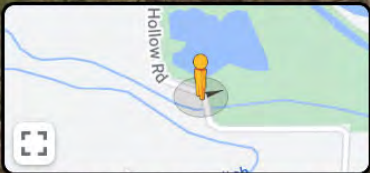
7416 Co Hwy 35

Longmont, Colorado

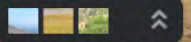
 Google Street View

Apr 2023

[See more dates](#)



Google





Williams-Merlin Open Space

After a patch cut was made in this Lodgepole pine stand on county open space along Peak-to-Peak Highway, it was experimentally replanted with seed of Limber pine, a rare plant in Boulder County. The objectives of the revegetation effort are to increase forest diversity and establish a seed source for use at other locations. Canada Thistle and Mullen are also taking advantage of the recent disturbance. A combination of spot herbicide treatments and hand work are being used to protect the young seedlings while controlling the infestation. Herbicide use is decreasing over time.





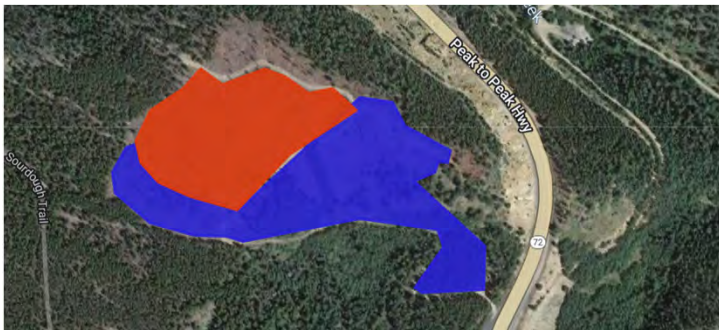
2021

BLUE: 7 acre treatment area
Treated 0.5 acres with herbicide
Or 7% of the treatment area



2022

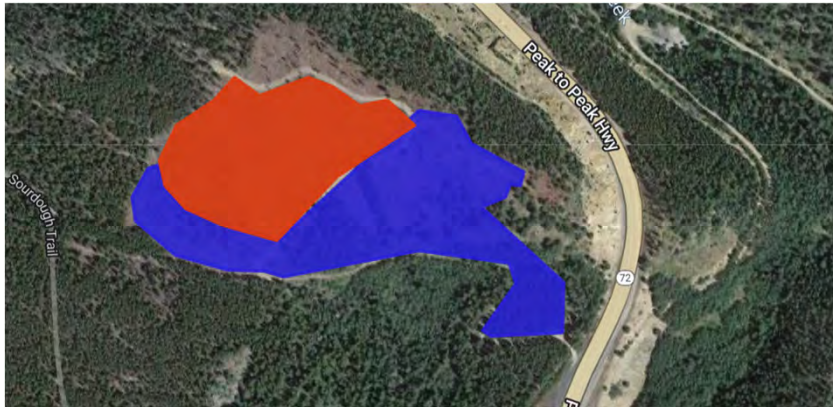
BLUE: 11.1 acre treatment area
Treated 1.16 acres with herbicide
Or 10.5% of the treatment area



2023

BLUE: 5.5 acre treatment area
Treated 0.24 acres with herbicide
RED: 3.9 acre manual treatment area

2.6% of combined area treated with herbicide



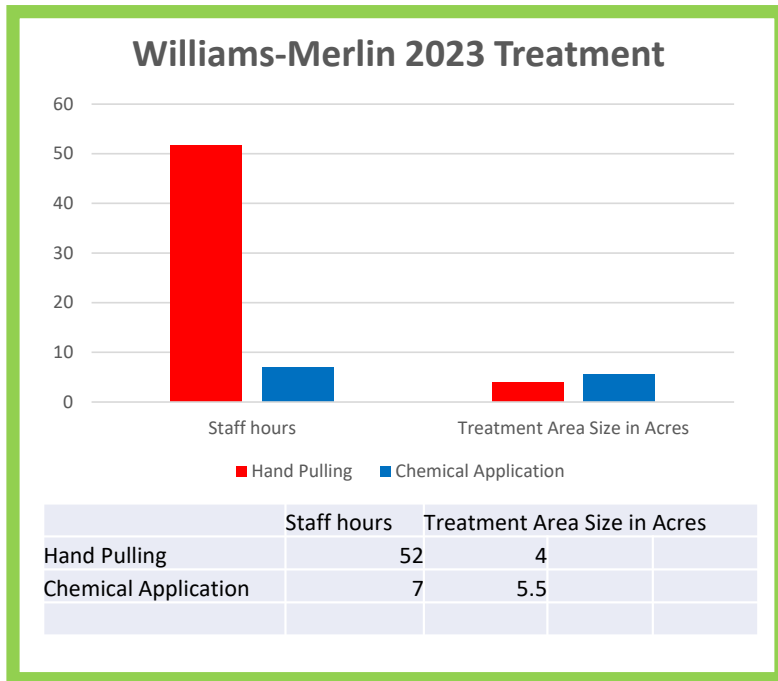
2023 – Case Study: Hand-pulling v. Spot Herbicide

RED: 4 acre hand-pulling treatment area
(52 staff hours or 13 hours per acre)

BLUE: 5.5 acre treatment area
Treated 0.24 acres with herbicide (4.4% of treatment area)
(7 staff hours or 1.3 hours per acre)

ANALYSIS

Hand pulling took 10x the staff resources
Herbicide use declined over time. Went from 7% of the treatment area to 10.5%, to 4.4%)



ALTERNATIVE WEED MANAGEMENT TOOLS

Method	Benefits	Challenges	Resources Required	Common application
Nutrafix (Cultural control)	<ul style="list-style-type: none"> Improves soil <u>health</u> Reduction in annual grasses & increases perennial grasses observed in trials 	<ul style="list-style-type: none"> High application rates (scalability & feasibility) Difficulty terrain 	<ul style="list-style-type: none"> Equipment Trials for utilization on POS land 	<ul style="list-style-type: none"> Depleted rangelands
Steam weeding (Mechanical control)	<ul style="list-style-type: none"> Controls annuals and young perennials Controls herbicide resistant noxious weeds No fire risk (unlike fire weeding) 	<ul style="list-style-type: none"> May require multiple treatments Does not directly impact underground plant structures (roots and rhizomes) or seeds High initial investment in equipment and energy Applying to difficult terrain 	<ul style="list-style-type: none"> Equipment PPE 	<ul style="list-style-type: none"> Residential areas Small acreage settings
Horticulture Vinegar (Chemical Control)	<ul style="list-style-type: none"> Can be used in areas where total vegetation control is <u>needed</u> Controls annuals Can suppress some perennial weeds 	<ul style="list-style-type: none"> Strong acid – proper PPE is essential Non-selective Does not directly impact underground plant structures or seeds 	<ul style="list-style-type: none"> PPE Herbicide 	<ul style="list-style-type: none"> Bare ground sites Landscaping
Compost Tea (Cultural Control)	<ul style="list-style-type: none"> Improves soil <u>health</u> 	<ul style="list-style-type: none"> Scalability Applying to difficult terrain 	<ul style="list-style-type: none"> Equipment Research is needed for feasibility and scalability 	<ul style="list-style-type: none"> Croplands Horticultural

Weed Management Cost/100 acres		
Activity	Cost/Acre	Cost/100 Acres
General Labor/Weed Whacking		
General Labor/Back Pack Spraying *		
Field Mowing		
Tractor Spraying		
Aerial Spraying		

Staff are reformulating these estimated costs based on information obtained since the Open House on Oct. 11th.

Aerial Application Policy



SJ0

Sheridan, Wy (Aerial Treatment for cheatgrass)

Proposed Aerial Application: Helicopter & Drone

Locations

- Remote terrain
- Steep slopes
- Efficiency—large infestations
- Drones are Effective for EDRR
- Helicopter applications no closer than 1/8 mi. of urban or residential areas
- Drone Applications can occur within the 1/8 mi. buffer



Proposed Aerial Application: Helicopter & Drone

Drift Mitigation Measures

- Buffer areas next to sensitive resources
- On site weather monitoring
- No treatment:
 - during inversions
 - when winds exceed herbicide label requirements
 - when weather forecasts predict rain in next 24 hours
 - Product Labels also provide drift management directions.



Proposed Aerial Application Policy

Notice of Application

Helicopter

- Notification 2 weeks in advance of Properties less than 1/8 mile of application areas
- All notifications will include purpose of application, target species and products to be applied.
- Open Space will be posted and closed

Drone

- post on daily herbicide application website
- Notifications will be posted at parks and trailheads
- All notifications will include purpose of application, target species and products to be applied.

Buffer Policy

- No Helicopter application with 1/8 mile of urban or residential areas.
- Use of drones in helicopter buffer areas
- 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 100 feet with written agreement of adjacent landowner
- 50' from environmentally sensitive areas (streams, irrigation canals, wetlands)



Aerial Applications Buffers

How do we compare with peer agencies?

- **No Overall Standards for buffers.**
- Herbicide labels can recommend buffers, but not all do.
- BLM has recommendations based on herbicides type, no spraying with winds over 6 mph.
- Oregon Department of Forestry range from 50 feet to 300 feet, depending on the water body (or sensitive site) and pesticide used schools and dwellings.

State of Washington Forest Practices Aerial Buffers	
Buffered Features	Min. Buffers Favorable Winds (<7mph)
Fish Bearing Waters	60-150 feet (width of inner zone)
Flowing non Fish Bearing waters	50 feet
A Wetland	50 feet
B Wetland	25 feet
Residences	200 feet
Ag. Lands	100 feet



Thank you!!

