

Boulder County Integrated Weed Management Plan



Version 1.0 | Draft for Public Review

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Executive Summary



Situated at the intersection of the Great Plains and the Rocky Mountains, Boulder County is endowed with an extraordinary geological and biological diversity, a natural heritage that helps form the foundation for an exceptional quality of life. Noxious weeds pose a threat to these cherished values; and in recognition of this threat, the state mandates and regulates noxious weed control throughout the state. Boulder County takes this stewardship mission seriously.

Noxious weed control is a complex problem; while most people can agree that biological diversity and ecosystem health are worthy objectives, there can be disagreement on the best ways to achieve them. Solutions require a long-term commitment of resources, applying a range of complementary tools and control methods along with professional judgment. Through the public engagement process, valuable input from the public and peers that has informed the strategies in this Integrated Weed Management Plan.

This Integrated Weed Management plan lays out the county's objective and strategies for noxious weed management on county-owned lands and private property:

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.

Four broad **Strategies** identify priorities for **management, collaboration, communication, and health and safety**. The plan provides details on the decision processes, tools and tactics employed to implement these strategies.

The Integrated Weed Management Story Map that accompanies this Integrated Weed Management Plan provides examples of how these tools and processes are applied across a range of noxious weed problems under varying circumstances and conditions.



1.0 Integrated Weed Management Overview

1.1 Colorado State Regulatory Requirements

The Boulder County Integrated Weed Management (IWM) program is managed pursuant to Article 5.5 of Title 35, Colorado Revised Statutes (C.R.S.), the Colorado Noxious Weed Act as amended (Appendix B). The purpose of the Noxious Weed Act is to act as a baseline for statewide management of noxious weeds and for all land to be protected by and subject to the jurisdiction of a local government empowered to manage undesirable plants. § 35-5.5.-102(1), CRS. Noxious weeds constitute a present threat to the continued ecological and economic value of lands in Boulder County. The state designates and maintains three weed lists with varying regulations for control (details in Section 2.2). This IWM Plan implements the mandates of Article 5.5 by setting forth management objectives, plans, methods, and practices that utilize a variety of techniques for overall integrated management of noxious weeds. In establishing a coordinated program for the integrated management of noxious weeds, it is the county’s intent to encourage and apply all appropriate and available management methods. See Appendix A for definitions of terms used in the IWM Plan.

1.2 Jurisdiction and Scope of IWM Plan

This IWM Plan shall apply to all public and private lands within unincorporated Boulder County, with the following exceptions:

- Federal and State lands. It is the duty of each state board, department, or agency that administers or supervises state lands to manage noxious weeds on any lands under its jurisdiction, using the methods prescribed by the local governing body in whose jurisdiction such state lands are located. The state weed coordinator shall survey those counties that include significant amounts of federal land to determine the level of cooperation and compliance by the federal government with this article. The local governing bodies of all counties and municipalities in this state are hereby authorized to enter into cooperative agreements with federal and state agencies for the integrated management of noxious weeds within their respective territorial jurisdictions.
- Municipalities are defined as: Any municipal service, function, facility, or property, whether owned by or leased to an incorporated municipality, unless the county and municipality agree otherwise pursuant to Part 2 of Article 1 of Title 29, C.R.S.
 - o The county is authorized to enter into an intergovernmental agreement pursuant to Part 2 of Article 1 of Title 29, C.R.S., or pursuant to Article 20 of Title 29, C.R.S., with incorporated municipalities in the county, other counties, and state and federal boards, departments, entities, and agencies, in order to cooperatively control and manage noxious weeds under the Act.
 - o The county also may enter nonbinding memoranda of understanding, or undertake other appropriate cooperative efforts, with these governmental entities or agencies
- Boulder County croplands are subject to the terms of the Boulder County IWM Plan and Boulder County Cropland Policy and enforced by the Boulder County Parks & Open Space Agricultural Resources Division.

1.3 Relation to Other Boulder County Plans and Policies

The Boulder County Integrated Weed Management Plan combines and replaces two documents that have been in use over the last couple decades: Boulder County Noxious Weed Management Plan and Boulder County Parks & Open Space Weed Management—Policies & Procedures.

The IWM Plan aligns with and supports the Board of County Commissioners (BOCC) strategic goals, goals laid out in the Boulder County Comprehensive Plan (Agricultural Resources Element, Environmental Resources Element, and Open Space Element) and the Boulder County Parks & Open Space (BCPOS) Vision, Mission, and Goals, in particular the following stewardship goals and policies:

Boulder County Comprehensive Plan, Environmental Resources Element:

- **Conserve & Preserve.** Boulder County shall conserve and preserve environmental resources, including its unique or distinctive natural features, biodiversity, and ecosystems, through protection and restoration in recognition of the irreplaceable character of such resources and their importance to the quality of life in Boulder County (ERE Goal 1).
- **Sustain & Protect.** Boulder County sustains and protects native species, natural ecosystems, and the biodiversity of the region by designating High Biodiversity Areas, Natural Areas, Natural Landmarks, Significant Natural Communities, Critical Wildlife Habitats, Species of Special Concern, Wetlands, Riparian Areas, and Rare Plant Areas. Other resources and designations may be identified in the future. These designated areas and species lists also provide a point of reference for continued monitoring of long-term ecological change (ERE Goal 2).
- **Promote Viability & Integrity.** Boulder County shall promote the viability and integrity of all naturally occurring ecosystems and their native species populations by applying a variety of environmental resources management strategies in a manner consistent with current ecological principles and sustainable conservation practices (ERE Goal 3).
- **Enhance Environmental Health.** Boulder County shall continue to protect air, water, and soil resources and quality, as well as restore resources in a degraded condition to enhance overall environmental health. Pollution of air, water, and soil, as well as pollution caused by noise or light, shall be eliminated or minimized to the greatest extent possible to prevent potential harm to life, health, and property and to reduce incremental degradation of the environment (ERE Goal 4).

Boulder County Comprehensive Plan, Open Space Element

- **Steward.** Boulder County purposefully stewards its open space resources through sound management practices and appropriate visitor uses (OS Goal 3).
- **Management Plans and Policies.** Through planning and management, Boulder County strives to preserve significant resources and enhance protection and restoration of native ecosystems and their native species populations while also providing passive, sustainable, and enjoyable public uses that connect the public to their environment (OS Policy 3.01.02).
- **Adaptive Planning.** Boulder County monitors and evaluates uses and resources on open space to inform management decisions and seeks to be innovative in its approaches to on-the-ground management of open space resources, utilizing knowledge of current conditions, latest science, and best technologies and practices (OS Policy 3.03).

Boulder County Comprehensive Plan, Agricultural Element

- **Management Best Practices.** The county shall use, and encourage all land owners to use, Best Management Practices, which may include chemical, fire, mechanical, biological, cultural control for weeds; chemical, physical, and cultural control for vertebrate pests; and chemical, biological, and cultural control for insects (Ag Policy 3.03).
- **State, Federal, and Local Programs.** The county shall actively participate in state, federal, and local programs directed toward Integrated Pest Management programs for noxious weeds, and vertebrate and insect pests (AG 3.02).
- **Certified Weed Free.** The county shall use and encourage the use of certified weed-free products, such as hay, mulch, gravel, bedding material, and general construction material (AG 3.04).

Parks & Open Space Vision:

Leading the way to exceptional open space.

Parks & Open Space Mission:

To conserve natural, cultural, and agricultural resources and provide public uses that reflect sound resource management and community values.

Parks & Open Space Goals

1. To preserve rural lands and buffers.
2. To preserve and restore natural resources for the benefit of the environment and the public.
3. To provide public outreach, partnerships and volunteer opportunities to increase awareness and appreciation of Boulder County's open space.
4. To protect, restore, and interpret cultural resources for the education and enjoyment of current and future generations.
5. To provide quality recreational experiences while protecting open space resources.
6. To promote and provide for sustainable agriculture in Boulder County for the natural, cultural, and economic values it provides.

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.

1.5 Impacts of Noxious Weeds

Noxious weeds are alien, exotic, or invasive species that have become or have potential to become successfully established and have significant negative impacts to native ecosystems, agriculture, water, and even our quality of life. According to the United States Department of Agriculture (USDA), the detrimental effects of noxious weeds in natural ecosystems may include a reduction in native biodiversity, changes in species composition, loss of habitat for dependent and native species (including wildlife), changes in biogeochemical cycling, and alteration of disturbance regimes. According to the USDA, "billions of dollars are spent every year to mitigate noxious weeds or control their impacts. 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. (Invasive Plants in Forests and Rangelands" <https://www.fs.usda.gov/ccrc/topics/invasive-plants>). Invasive species are among the leading threats to native wildlife. Approximately 42 percent of threatened or [endangered species](#) are at risk due to invasive species.

Ecological and Climate Change Impacts

- USGS concluded that sagebrush habitat has been shrinking rapidly because of wildfire, invasive grasses and human development. Conservation organizations maintain that without intervention, sage grouse populations will only continue a downward spiral. Remington, T.E., Deibert, P.A., Hanser, S.E., Davis, D.M., Robb, L.A., and Welty, J.L., 2021, Sagebrush conservation strategy
- According to studies of the Great Basin in Nevada, conversion to cheatgrass reduced above-ground carbon sequestration by 90% and below-ground sequestration by 50%. Considering that 10 million acres in the Great Basin have been degraded by cheatgrass — that’s a lot of lost potential for carbon sequestration! (Mary Jo Brooks, 2021, National Wildlife Federation)

Biodiversity

- A national study conducted by Environmental Defense concluded that 49% of the nation’s threatened and endangered species are adversely affected by non-native species that place increasing pressures upon these sensitive, native species. 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.
- 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.”
- Indirectly, invasive species may cause native species declines due to resource competition and habitat alteration (Davis 2009). For instance, plant invasions have been demonstrated to alter carbon and nitrogen cycles and fire regimes in invaded ecosystems (Simerloff and Rejmánek 2011). 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 and Rejmánek 2011), and [saltcedar](#) (*Tamarix* spp.) makes the soil inhospitable to native species by depositing large amounts of salt into the surrounding soil (Bell et al. 2002).

Economy

- Invasive species have become the greatest environmental challenge of the 21st century in terms of economic, environmental, and human health costs, with an estimated impact in the U.S. of over \$138 billion per year. (Stohlgren, 2004) Managers of Department of the Interior and other public and private lands and waters rank invasive species as their top resource management problem. Recent natural disasters have underscored the potentially devastating impacts of noxious weeds.
- A study on the Economic Impact of Invasive Weed Species in Colorado (Frasier, Agricultural & Economics, Colorado State University, 2014) identifies just 10 of Colorado’s 82 state-designated noxious weed species finds “Based on the evidence at our disposal, the total annual direct cost of the ten weed species is nearly \$14 million annually with agricultural, wildlife, and recreational values all being similar”.

Some impacts of noxious weeds in Boulder County include:

- Loss and degradation of native ecosystems, flora, and fauna, through invasion of species, such as cheatgrass, common teasel, diffuse knapweed, or Siberian Elm, which greatly alter landscape diversity and function.
- 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. Colonization by cheatgrass is also predicted to increase risk of wildfires, as dead plant parts provide fuel in the already dry and arid regions of the western United States. (Arathi H. S., J. Hardin, 2021)
- 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.



2.0 Boulder County IWM Plan Responsibilities and Delegation

2.1 Roles and Responsibilities

2.1.1 Local Advisory Board and County Staff

Local Advisory Board

Pursuant to CRS 35-5.5-107(1) the Local Advisory Board (Advisory Board) is the Boulder County Board of County Commissioners. The Board has delegated its authorized functions to County Weed Coordinator and Community Planning & Permitting Department (CPP) enforcement staff.

1. The Advisory Board develops the management plan and transmits it to the BOCC for approval, modification, or rejection.
2. The Advisory Board declares noxious weeds and any state noxious weeds designated by rule to be subject to management, control, or eradication.
3. The Advisory Board will meet at regular intervals, but not less than once every three years, to review and evaluate the management plan and its implementation.
4. The Advisory Board coordinates with and makes recommendations to the Boulder County BOCC regarding amendments and revisions to the Plan.
5. The Advisory Board makes recommendations regarding staffing to implement this plan.
6. The Advisory Board will seek individual integrated management plans for county departments/agencies responsible for road rights-of-way, parks, open space, landscaped areas, etc. and will identify other entities responsible for submitting plans.
7. The Advisory Board may recommend to the Boulder County BOCC that identified landowners be required to submit an individual integrated management plan to manage noxious weeds on their property.

Additional County Weed Coordinator and Staff Responsibilities

1. The Boulder County Weed Coordinator and weed management staff will provide guidance and technical assistance to the Advisory Board.
2. The Boulder County Weed Coordinator is responsible for cooperating with the Advisory Board to implement this Plan.
3. The Boulder County Weed Coordinator will provide technical assistance to private landowners and facilitate development of management plans for their land.
4. The Boulder County Weed Coordinator may provide technical assistance to public landowners/operators and facilitate development of management plans for their land.
5. The Boulder County CPP Weed and Pest Management Specialist will be responsible for enforcing the Noxious Weed Control Act (CRS 35-5.5) on private property within unincorporated Boulder County.

2.1.2 Eradication and Management of Noxious Weeds on Boulder County Properties

Working under the Boulder County Weed Coordinator the BCPOS Noxious Weed Work Group is currently responsible for implementing the IWM Plan on approximately 42,000 acres of Parks & Open Space (POS) land designated as natural areas; 7,000 acres of POS land under rangeland agricultural leases that serve as wildlife

habitat, 65 miles of trails and 685 miles of county-maintained rights-of-way. The department is also responsible for vegetation management on other county owned lands throughout Boulder County.

2.1.3 Eradication and Management of Noxious Weeds on Private Property

As part of this Integrated Weed Management Plan, the County adopts all requirements and duties set forth in Colorado Revised Statutes Section 35-5.5-101 et. Seq, including the procedures for entry, inspection, notification, and enforcement of noxious weeds on private property in Colorado Revised Statutes Sections 35-5.5-108.5 and 35-5.5-109. Consistent with Colorado Revised Statute Sections 35-5.5-105 and 35-5.5-109, the Boulder County Board of County Commissioners may also adopt ordinances, resolutions, rules, and other regulations necessary to effectively eradicate and manage noxious weeds on private property.

The Director of Community Planning & Permitting is responsible for performing all functions and duties necessary to comply with the requirements set forth in Colorado Revised Statutes Section 35-5.5-101 et. Seq., with respect to the regulation and enforcement of noxious weeds on private property.

2.1.4 Municipalities

Municipalities, as defined by CRS 31-1-101(6), are responsible for noxious weed management within their jurisdiction under the provisions set forth in C.R.S 35-5.5-106. Acknowledging that noxious weeds do not recognize boundaries, the Act does encourage cooperation among agencies to assist in control of noxious weeds.

2.2 Designation of Noxious Weeds in Boulder County

The noxious weed species listed below are managed consistent with “Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act, 8 CCR 1206-2” (“Rules”), (given the frequency that weed lists are updated, please refer to the state’s webpage for current information: [Colorado CCR Document List \(state.co.us\)](https://state.co.us)) and in Appendix C, Management Plan for Boulder County List C and Local Noxious Weeds. Currently the State of Colorado Department of Agriculture has designated 82 species on List A, B, and C. Boulder County is known to have 58 of these 82 listed species.

For the complete list of Colorado Noxious weeds, visit the Colorado Department of Agriculture’s website.

<https://ag.colorado.gov/conservation/noxious-weeds/species-id>

Several noxious weed species have native Colorado look-alike plants. For resources on how to distinguish these species, visit the Colorado Department of Agriculture’s website or contact the Boulder County Noxious Weed Coordinator.

2.2.1 Boulder County List A Noxious Weed Species

All populations of List A species in Colorado are designated for eradication by the State Department of Agriculture Commissioner. It is a violation of 8 CCR 1206-2” (“Rules”), (Appendix C), to allow any plant of any population of any List A species to produce seed or develop other reproductive propagules.

Boulder County currently has 12 of the 18 List A species that occur in Colorado, which is the highest number of List A species in any Colorado county.

Colorado List A species with current or historical populations in Boulder County:

1. Dyer’s Woad, *Isatis tinctoria*
2. Rush Skeletonweed, *Chondrilla juncea*
3. Yellow Starthistle, *Centaurea solstitialis*
4. Cypress Spurge, *Euphorbia cyparissias*
5. Giant Reed, *Arundo donax*
6. Hairy Willowherb, *Epilobium hirsutum*

7. Knotweeds (Japanese, Bohemian, Giant), *Fallopia japonica*, *Fallopia sachalinensis*, *Fallopia bohemica*
8. Mediterranean Sage, *Salvia aethiopsis*
9. Myrtle Spurge, *Euphorbia myrsinites*
10. Orange Hawkweed, *Hieracium aurantiacum*
11. Purple Loosestrife, *Lythrum salicaria*
12. Yellow Flag Iris, *Iris pseudacorus*

2.2.2 Boulder County List B Noxious Weed Species

List B noxious weeds have discrete statewide distributions and are subject to eradication, containment, or suppression in areas designated by the Department of Agriculture Commissioner in consultation with the State Noxious Weed Advisory Committee, local governments, and other interested parties. List B species must be managed in accordance with all the provisions of 8 CCR 1206-2 (“Rules”), including any applicable state noxious weed management plans. In addition, the Department of Agriculture Commissioner gathers data on List B species on a rotation schedule to determine update management plans as set forth in 8 CCR 1206-2 (“Rules”).

Colorado List B noxious weed management objectives for Boulder County:

Management Objective	Common name	Scientific Name
Eliminate	Absinth Wormwood	<i>Artemisia absinthium</i>
Eliminate	Blackhenbane	<i>Hyoscyamus niger</i>
Eliminate	Bouncingbet	<i>Saponaria officinalis</i>
Contain	Bull thistle	<i>Cirsium vulgare</i>
Suppress	Canada thistle	<i>Cirsium arvense</i>
Eliminate	Mayweed/stinking chamomile	<i>Anthemis cotula</i> ,
Eliminate	Scentless chamomile	<i>Tripleurospermum inodorum</i>
Eliminate	Chinese Clematis	<i>Clematis orientalis</i>
Eliminate	Common Tansy	<i>Tanacetum vulgare</i>
Contain	Common Teasel	<i>Dipsacus fullonum</i>
Contain	Cutleaf Teasel	<i>Dipsacus laciniatus</i>
Suppress	Dalmatian Toadflax	<i>Linaria etiolate</i> ,
Suppress	Dalmatian Toadflax	<i>Linaria genistifolia</i>
Eliminate	Dames Rocket	<i>Hesperis matronalis</i>
Contain	Diffuse Knapweed	<i>Centaurea diffusa</i>
Contain	Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>
Contain	Hoary Cress	<i>Lepidium draba</i>
Contain	Houndstongue	<i>Cynoglossum officinale</i>
Eliminate	Jointed Goatgrass	<i>Aegilops cylindrica</i>
Contain	Leafy Spurge	<i>Euphorbia esula</i>
Eliminate	Moth Mullein	<i>Verbascum blattaria</i>
Contain	Musk Thistle	<i>Carduus nutans</i>
Contain	Oxeye Daisy	<i>Leucanthemum vulgare</i>
Contain	Perennial Pepperweed	<i>Lepidium latifolium</i>
Eliminate	Plumeless Thistle*	<i>Carduus acanthoides</i>

Management Objective	Common name	Scientific Name
Eliminate	Russian Knapweed	<i>Acroptilon repen</i>
Contain	Russian Olive	<i>Elaeagnus angustifolia</i>
Eliminate	Salt Cedar	<i>Tamarix chinensis</i>
Eliminate	Salt Cedar	<i>Tamarix ramosissima</i>
Contain	Scotch Thistle	<i>Onopordum acanthium</i>
Contain	Scotch Thistle	<i>Onopordum tauricum</i>
Contain	Spotted Knapweed	<i>Centaurea stoebe</i>
Contain	Sulfur Cinquefoil	<i>Potentilla recta</i>
Eliminate	Wild Caraway	<i>Carum carvi</i>
Eliminate	Yellow Nutsedge	<i>Cyperus esculentus</i>
Eliminate	Yellow Toadflax	<i>Linaria vulgaris</i>
Eliminate	Yellow x Dalmatian toadflax hybrid	<i>Linaria vulgaris x L. dalmatica</i>
Contain	Spotted x diffuse knapweed hybrid	<i>Centaurea x psammogena</i>

For List B Containment Maps, please see Colorado Department of Agriculture website ([County Weed Programs | Department of Agriculture \(colorado.gov\)](https://www.colorado.gov/agriculture)).

2.2.3 Boulder County List C Noxious Weed Species that Require Management

List C noxious weeds are widespread and well-established noxious weed species for which control is recommended but not required by the state, although local governing bodies may require management. The Boulder County Local Advisory Board has selected 14 of the 18 Colorado List C noxious weed species to require management on Boulder County-owned land. Management objectives for these species can be found in Appendix C, Management Plan for Boulder County List C and Local Noxious Weeds. Management objectives for these species on county lands will be informed by continued mapping and data collection by the BCPOS Noxious Weed Workgroup. Although management is not required for these species on private property within Boulder County, it is recommended.

Colorado List C Species that require management on Boulder County-owned land and rights-of-way:

1. Bulbus Bluegrass, *Poa bulbosa*
2. Chicory, *Cichorium intybus*
3. Common Burdock, *Arctium minus*
4. Common Mullein, *Verbascum thapsus*
5. Common St. Johnswort, *Hypericum perforatum*
6. Downy Brome, (i.e., cheatgrass) *Bromus tectorum*
7. Field Bindweed, *Convolvulus arvensis*
8. Perennial Sowthistle, *Sonchus arvensis*
9. Poison Hemlock, *Conium maculatum*
10. Puncturevine, *Tribulus terrestris*
11. Redstem filaree, *Erodium cicutarium*
12. Siberian Elm, *Ulmus pumila*
13. Tree of Heaven, *Ailanthus latissimi*
14. Velvetleaf, *Abutilon theophrasti*

2.2.4 Boulder County Local Noxious Weeds:

The following species are not listed under “Rules” but have been declared by Boulder County BOCC as local noxious weeds that pose a threat in Boulder County and require management on Boulder County-owned lands. Authority to designate additional noxious weeds is granted under C.R.S 35-5.5-108. Management objectives for these species can be found in Appendix C, Management Plan for Boulder County List C and Local Noxious Weeds.

1. Common Reed, *Phragmites australis**
2. Garlic Mustard, *Alliaria petiolate**
3. Garden Loosestrife, *Lysimachia vulgaris**
4. Hoary Alyssum, *Berteroa incana**
5. Meadow Hawkweed, *Hieracium caespitosum*
6. Perennial Sweet Pea, *Lathyrus latifolius**
7. Tall Oatgrass, *Arrhenatherum elatius**
8. Kochia, *Kochia scoparia*
9. Curly Dock, *Rumex crispus*
10. Smooth Brome, *Bromus inermis*
11. Crack Willow – *Salix fragilis*
12. Russian Thistle – *Salsola tragus*
13. Blue Mustard – *Chorispora tenella*
14. Wild Lettuce – *Lactuca serriola*

*These species are on the Colorado Department of Agriculture Watchlist for Noxious Weeds.



3.0 Boulder County Integrated Weed Management Tools and Implementation

3.1 Integrated Weed Management

C.R.S. 35-5.5-104 sets forth a General Duty to Manage Noxious Weeds: “it is the duty of all persons to use integrated methods to manage noxious weeds through the implementation of appropriate management practices, if such weeds are likely to be materially damaging to the land of neighboring landowners.”

The Colorado Department of Agriculture maintains List A, List B, and List C noxious weeds and sets forth management plans for their required control. These weeds are targeted for treatment because of their negative impacts on other organisms or the surrounding environment.

Boulder County relies on best practices and scientific evidence to inform weed management. Integrated weed management tools and practices are carefully selected based on the required state management guidelines for specific List A, B, or C species (eradication, suppression, or elimination), the size of infestation (i.e., single plant to large monoculture infestations), location (i.e., critical habitat, riparian areas, sensitive areas, etc.) and known best controls for individual species.

Integrated weed management can restore ecological health using complementary weed control tools, including mechanical, cultural, chemical, and biological methods. IWM was originally developed in the 1960s for agricultural pests and then urban landscapes. Somewhat different approaches are needed when implementing an IWM approach on natural lands. For purposes of managing noxious weeds on county land, IWM is:

- An adaptive process that considers new science, technology, and understanding of noxious weeds and their environment.
- A decision-making system that adapts to changing conditions. Control methods are determined based on the noxious weed species and site-specific conditions, and methods are not universally applied to all noxious weed problems. It must be recognized that not every tool can be used successfully in every situation and there will be site-specific needs that will require flexibility to achieve the best weed management outcomes.
- A program to ensure minimizing the use of herbicides. It is not necessarily intended to eliminate herbicide use; however, well developed, science-based IWM programs typically reduce the overall total use of herbicide over time because they employ a wider array of pest management techniques (i.e., physical, biological, and cultural weed control, as well as chemical control) that, in combination, are more effective at eliminating weed issues.

3.2 Integrated Weed Management Implementation

Identifying methods of control and tolerance levels or thresholds at which those methods are used can be complex. As stated above, tools include mechanical, cultural, biological, and chemical controls. How these controls are utilized depends upon the Statewide management objectives (i.e., State List A requires eradication, List B comes with specific State suppression or elimination zones); county management goals for wildlife, plant ecology, or forestry; habitat rehabilitation; or other impacts created by noxious weeds. Other considerations include threats to infrastructure and roadway safety. Furthermore, programs to control noxious weeds often require a long-term commitment. For many noxious weed species, short-term lapses in active management can negate years of expensive control programs.

The weed control decision process is depicted by the two Figures below. Figure 1 summarizes the progression of treatment from prevention (when no weed population is present) to widespread establishment.

Boulder County spends significant staff time scouting in order to detect presence of weed species, with particular focus on List A species, before they spread. Once a weed is detected, “Early Detection Rapid Response” is crucial to prevent reproduction and spread. A recent example in Boulder County is Mediterranean Sage, a List A species detected west of US36 in the 1990s. Boulder County and City of Boulder have dedicated significant resources to contain Med Sage, with great success, though this species has not yet been entirely eradicated.

For established weed species, elimination (if possible) and containment are the next steps in the progression, along with protecting uninfested areas from being invaded. Finally, in the case of widespread establishment, elimination may not be possible or economically feasible, though elimination will continue to be pursued in high value natural areas or rangelands. In these cases, suppression is the goal. The staff time and resources dedicated to each of these steps varies across weed species.

Figure 1: Decision Model for Early Detection and Rapid Response

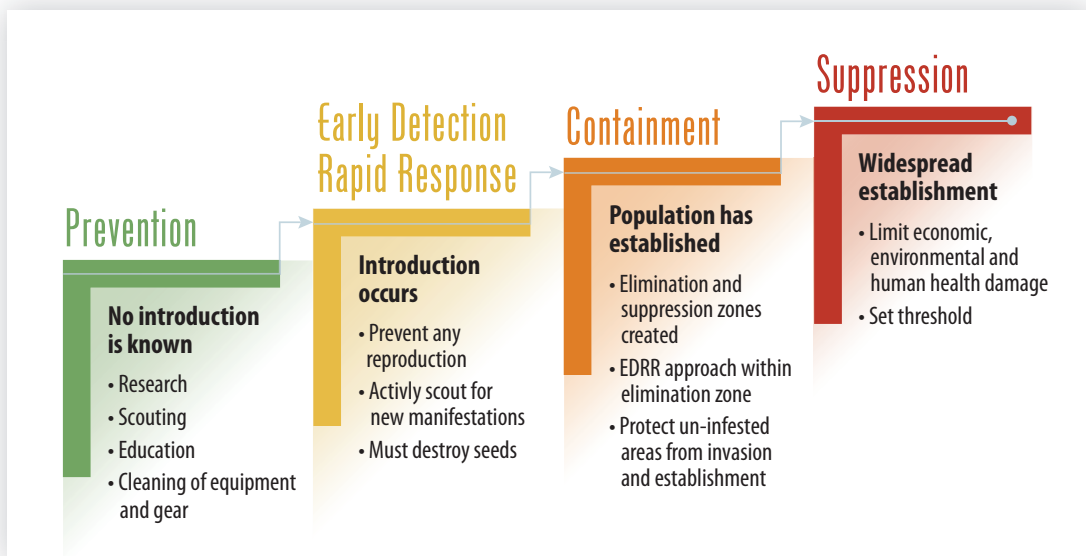
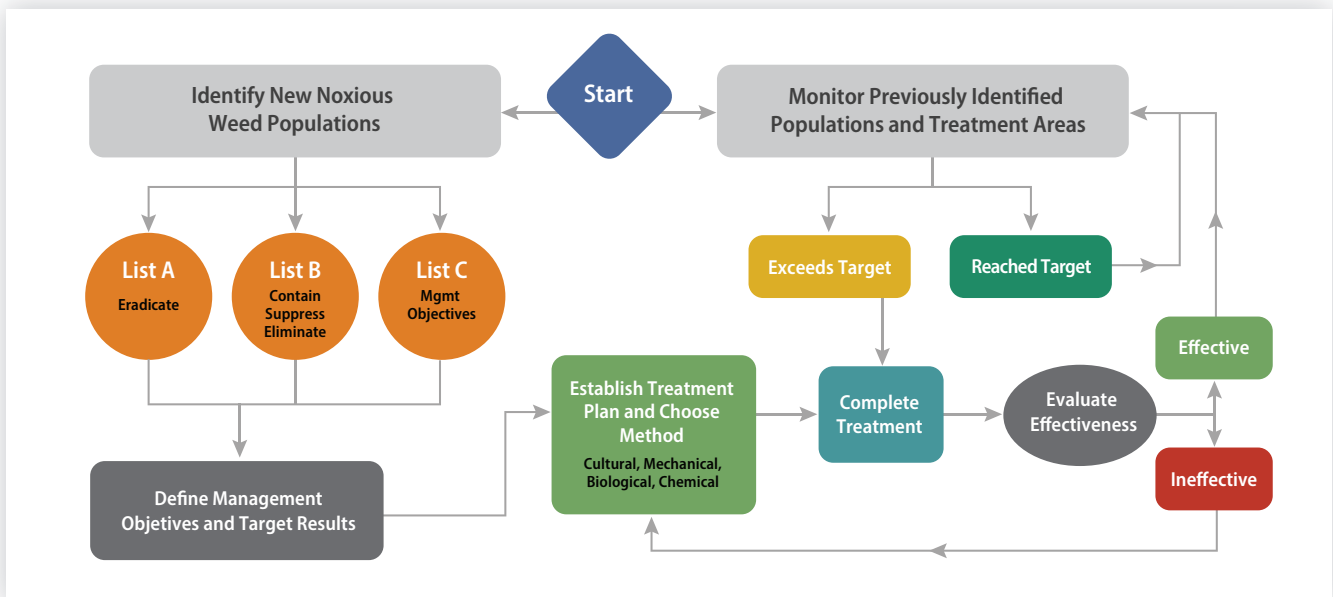


Figure 2: IWM Decision Model



For List A and List B species, management objectives are provided by the Commissioner of the Colorado Department of Agriculture, which determine action thresholds for all List A and most List B species in Boulder County. The Colorado Department of Agriculture Commissioner also outlines approved methods of treatment for these same species. These two factors influence which tools Boulder County can utilize in managing these species. Species with the management objective of suppression on List B, List C, and Local Noxious weeds action thresholds are set by BCPOS Noxious Weed Workgroup in consultation with Parks & Open Space plant ecology, wildlife, and agriculture staff. Factors considered when setting these action thresholds include impacts to wildlife habitat, presence of rare or endangered species, resiliency of natural areas, agricultural production, scale of infestation, and post-disturbance restoration. In addition to the above factors, worker safety, visitor safety, and the technical feasibility of meaningful control (i.e., a cost/benefits analysis) are also considered.

Within those parameters, the county also looks at the potential of the noxious weeds to degrade wildlife habitat and other natural resource values such that the long-term stability and resiliency of its natural area are not compromised. To do so, staff must consider worker safety, visitor safety, and the technical feasibility of meaningful control (i.e., a cost/benefits analysis).

Noxious weed species thresholds must factor in the scale at which a management tool is both practical and effective. Some of the county's noxious weed populations are present across multiple open spaces or present throughout the entire region. Treatments such as hand removal may have minimal negative unintended impacts when a few individuals are removed, but substantially greater impacts (e.g., soil erosion or damage to non-target species, injury to staff) when the same treatment is applied to large areas. Similarly, the control of large populations of noxious weeds using mechanical control methods can be cost prohibitive, impractical, and dangerous.

Boulder County's topography makes IWM challenging, since noxious weed problems in Boulder County are as varied as the county's topography. Newly introduced weed species are a constant concern, with an influx of people from all parts of the country transporting weed seed by way of livestock and/or vehicles. It is important that property owners are aware of newfound species, are aware of noxious weed issues, and are actively controlling weeds as necessary.

Boulder County promotes and uses methods that are effective and environmentally safe while remaining practical and economically feasible. Implementation will be consistent with the noxious weed management objectives and goals found in this IWM Plan and follow any mandates outlined in C.R.S. 35-5.5.

3.3 Integrated Weed Management Tools

Integrated weed management tools are described below.

3.3.1 Cultural Tools

Prevention – Preventing establishment of noxious weeds is the best method for control and reducing expansion of noxious weed populations. The first line of defense is scouting to identify new infestations. Prevention is also accomplished by minimizing disturbances and preventing seed transport. Maintaining healthy ecosystems and ecological function prevents noxious weed establishment, as a healthy functioning ecological system has higher resistance to weed establishment and expansion than on degraded and disturbed sites.

To assist in the spread of weed seeds along trails, the county has installed boot brush stations with educational plaques. This can help park users understand how the transportation of noxious weed seeds can cause further expansion of noxious weed problems. Additionally, staff plans to add to park kiosks to allow park patrons to access further prevention methods or report noxious weeds they may find in the park.

Along rights-of-way, prevention is accomplished by cleaning roadside mowers and other equipment. This greatly aids in curbing the further distribution of noxious weeds across the county.

Other preventative measures include avoiding the use of imported topsoil on restoration projects, requiring weed-free mulching and seeding materials, educating homeowners about weed ID and appropriate plant materials for landscaping, and maintaining healthy landscapes resilient to weed invasion.

TABLE 1: Prevention Tools

Method	Benefits	Challenges	Resources Required
Public education	<ul style="list-style-type: none"> Increases awareness of impacts of noxious weeds 	<ul style="list-style-type: none"> Ensuring our messages are getting out to the public 	<ul style="list-style-type: none"> Staff Time Research Materials
Scouting	<ul style="list-style-type: none"> Identifies new infestations that can be managed before larger infestations can occur. 	<ul style="list-style-type: none"> Time consuming to survey large areas Challenges due to rugged terrain 	<ul style="list-style-type: none"> Staff time Drone technology may prove to be beneficial
Cleaning of vehicles and equipment between sites	<ul style="list-style-type: none"> Prevents seeds from being transferred from on site to another. Decreases the number of new invasions. 	<ul style="list-style-type: none"> County wide and contractor compliance is difficult to encourage 	<ul style="list-style-type: none"> Equipment Staff Time Education
Public boot brush stations	<ul style="list-style-type: none"> Prevents seeds from being transferred from on site to another. Decreases the number of new invasions. 	<ul style="list-style-type: none"> Use is encouraged but not also followed 	<ul style="list-style-type: none"> Staff time Boot brush stations Maintenance of boot brush stations

Revegetation – Revegetation with native species is used in areas where there are insufficient native plants or native seedbank to naturally restore the area. This condition is commonly found in areas where arable farming has or had occurred or where grazing or other disturbances, such as floods and prairie dogs, have depleted native plants and seedbanks. Revegetation is also utilized post disturbance with trail or general infrastructure construction projects to reduce the occurrence of noxious weeds that establish post construction. Each open space site is evaluated for desired outcomes, and consultation with Plant Ecology and Agricultural Resources staff is an integral part of revegetation efforts.

Grazing – Grazing may suppress noxious weeds but has limited impacts on eradicating or containing noxious weeds. Livestock moving from site to site can be a vector for moving noxious weed seeds to new locations. Goats can be used for noxious weed suppression in some localized situations depending on management objectives for the site. Goats are more expensive than other control measures, while cattle or horse grazing is conducted through agriculture leases.

Consideration must also be given to the grazing impact from livestock use. Impacts of overgrazing can include danger of spreading disease to wildlife and potential liability of events relating to escaped animals. One example of this is Boulder County’s agreement with Colorado Parks and Wildlife to avoid using goats and sheep west of Hwy 36 for protection of Bighorn Sheep herds.

Continuing Education – In order to stay current with research and science-based management practices, staff takes advantage of professional development opportunities through professional associations such as Western Society of Weed Science, Society for Range Management, Colorado Weed Management Association, Great Plains Grassland Conference, and High Altitude Revegetation Workshops.

Research – The county weed management staff utilizes the Parks & Open Space Department’s Small Grant Research program and collaborates with research institutions to conduct research that helps inform noxious weed management activities and their efficacy. These studies and monitoring data collected by the county’s noxious weed management staff provide valuable information on management activities. Such studies can focus on restoration, weed management utilizing organic methods, insect biocontrol and/or herbicide application, mapping and monitoring riparian corridors, and prescribed fires for cheatgrass suppression. Tours of the field sites in Boulder County and on sites in other counties in Northeast Colorado take place each season to highlight and demonstrate results of research.

Public Outreach – Education is a critical component of county weed management. CSU Cooperative Extension and its agents work with Boulder County Weed Management to educate the public about noxious weed management. CSU Extension agents help by providing small acreage weed management workshops, conducting individual site visits to include agricultural, commercial horticulture, and home horticulture consultations, and offering other educational opportunities such as the Native Plant Master Programs, which include impact of noxious weeds, weed identification, and management.

Volunteer Events – Several species of noxious weeds can be managed by mechanical methods of removal, but it is very labor and time intensive. Volunteer events provide valuable assistance in strategic areas. These events include List A removal and scouting, trail clearing, seed head bagging in sensitive areas, and noxious weed tree removal. In addition to helping remove the species, volunteers learn about noxious weeds, how to identify them, and how to report infestations. This educational component supports and assists in the prevention of weed spread and the long-term goals of the IWM Plan.

TABLE 2: Cultural Tools

Method	Benefits	Challenges	Resources Required
Grazing	<ul style="list-style-type: none"> Prevents seed set Can cause root reserves to be depleted if used in an ongoing-repetitive manner. Can access remote and difficult terrain. 	<ul style="list-style-type: none"> Late use can result in spread. Not a selective method Intense grazing can lead to disturbance and may facilitate additional invasions. Some noxious weed species are toxic to livestock. Not all topography is grazable. Presence of predators in open space Agreement with CPW to not graze goats or sheep West of Highway 36. 	<ul style="list-style-type: none"> Expensive for large scale contract In house would require new staff, training and acquiring a herd. Watering infrastructure Fencing
Prescribed (Rx) Fire	<ul style="list-style-type: none"> Can suppress several species of noxious weeds. Beneficial for local ecosystems Helps reduce fire risk in the wildland-urban interface 	<ul style="list-style-type: none"> Disturbance caused may facilitate additional invasions. Often needs to be used in combination of other tools to be effective long term. Safety Burn windows are limited Burn restrictions include weather, air quality, wildlife and rare plant concerns. 	<ul style="list-style-type: none"> Rx fire staff time Must close the area to the public Special equipment Training Smoke permits
Revegetation	<ul style="list-style-type: none"> Increases competition with noxious weed following disturbance. Increases native habitat and biodiversity. 	<ul style="list-style-type: none"> Ability to get equipment into areas Availability of local native seeds Labor and time intensive to hand seed Weather has large impact on success Requires follow up noxious weed control 	<ul style="list-style-type: none"> Equipment and equipment maintenance Research Staff time Local seed – can be costly at a large scale
Research	<ul style="list-style-type: none"> Informs adaptive management decisions Guides decisions on treatment methods. Provides data and information to advance science. 	<ul style="list-style-type: none"> Time intensive for staff Subject to availability of funding 	<ul style="list-style-type: none"> Staff time Funding for outside research

3.3.2 Mechanical Tools

Mowing – Mowing is a tool to control certain types of noxious weeds. Boulder County utilizes tractor mowing to assist in controlling open space noxious weeds and roadside rights-of-way.

- Open space mowing is used for noxious weed suppression on areas when feasible, which aids in preventing weeds from flowering and dispersing seed.
- Roadside mowing provides management of vegetation at intersections and along roadways to providing clear lines of sight for motorists and cyclists. Mowing roadside edges also provides improved reaction times for motorists when wildlife is present in/or crossing roadways. Mowing roadsides encourages perennial grasses over broadleaf vegetation (typically noxious weeds) and reduces potential for roadside fire ignition and roadway distribution of noxious weed seeds.

Weed Whipping/Whacking – this form of mechanical control provides the same benefits as mowing and is utilized in areas that are difficult for large tractor-mounted mowers to access, such as road signage, trailheads, structures, wet areas, restoration areas with shrubs, trees, and sensitive, desirable plantings.

Hand Pulling and Digging – Hand pulling and digging are used to eliminate isolated or scattered patches of annual and biennial noxious weeds, including many List A species. This method relies heavily on volunteer projects to be successful (more information under “Volunteer Projects” in 2.2.2 Cultural Methods section below). It can be effective where scattered plants or small concentrated populations are found. Digging or pulling large areas or dense populations of plants disturbs the soil, allowing other noxious weeds to establish. This method is not effective on deep-rooted or rhizomatous-spreading perennials. This method may also be utilized in sensitive areas. Manual hand-pulling should be repeated prior to seeds setting at least twice a year for 7-10 years or longer.

Seed Head Removal – This method is often used in combination with others to prevent seed development and dispersal for List A species, List B species selected for eradication, and other noxious weeds growing in high priority areas, such as restoration and revegetation sites. Seed head removal alone is often not enough for elimination and should be considered a suppression method when used alone.

Prescribed Fire (Rx Fire) – Prescribed fire can be used as a control method for noxious weeds. It has limited long-term results, as the seed source is often not addressed through fire alone. It can be detrimental to native ecosystems if cheatgrass infestations are present and the fire burns too hot. Prescribed fire has been documented to cause high native shrub and plant mortality, with limited control of cheatgrass infestations. Prescribed fire activities can be expensive relative to other forms of control. However, under certain circumstances, prescribed fire can provide ecological benefits to existing native vegetation that may aid in suppression of noxious weeds.

TABLE 3: Mechanical Tools

Method	Benefits	Challenges	Resources Required
Mowing	<ul style="list-style-type: none"> • Prevents seed set in some species. • Treats large areas relatively quickly. 	<ul style="list-style-type: none"> • Late use can result in spread. • Only suppresses most perennial species. • This method may increase density in some species. • May negatively affect desirable species 	<ul style="list-style-type: none"> • Special Equipment • Equipment Maintenance • Staff Time • Training

(Table 3: Mechanical Tools cont.)

Method	Benefits	Challenges	Resources Required
Weed whipping	<ul style="list-style-type: none"> • Effective with small or isolated patches. • Ideal for sensitive sites, i.e., new restoration sites and wetlands 	<ul style="list-style-type: none"> • Labor intensive success relies heavily on volunteer support. • Densely infested areas could be invaded by new noxious weeds due to disturbance. • Some species this method may increase density. 	<ul style="list-style-type: none"> • Time intensive – additional staff or volunteers needed for large scale • Bags for disposal • Labor intensive
Hand Pulling	<ul style="list-style-type: none"> • Effective with small or isolated patches. • Ideal for sensitive sites, i.e., new restoration sites and wetlands 	<ul style="list-style-type: none"> • Labor-intensive success relies heavily on volunteer support. • Densely infested areas could be invaded by new noxious weeds because of disturbance. • This method may increase density in some species. 	<ul style="list-style-type: none"> • Time intensive – additional staff or volunteers needed for large scale. • Bags for disposal • Labor intensive • Need for repeated efforts over multiple years
Digging	<ul style="list-style-type: none"> • Can be very effective with small or isolated patches 	<ul style="list-style-type: none"> • Labor-intensive success relies heavily on staff hours and volunteer support. • Densely infested areas could be invaded by new noxious weeds because of disturbance. • This method may increase density in some species. 	<ul style="list-style-type: none"> • Time intensive – additional staff or volunteers needed for large scale. • Bags for disposal • Labor intensive • Need for repeated efforts over multiple years
Seed head collection	<ul style="list-style-type: none"> • Prevents seed set 	<ul style="list-style-type: none"> • Bagging is required; very time and labor intensive. • Cannot eradicate perennial species and, therefore, is often combined with other methods. 	<ul style="list-style-type: none"> • Time intensive – additional staff or volunteers are needed for large scale. • Labor intensive • Bags for disposal • Need for repeated efforts over multiple years

3.3.3 Chemical Tools

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

Spot Spraying is used to eliminate or contain small or isolated patches of noxious weed species. Additionally, this method is used along trails and rights-of-way and in natural areas to minimize off-target impacts to other sensitive or desirable plants to prevent seed distribution of noxious weeds. This method may include the use of backpack sprayers, handheld spraying nozzles from trucks or Utility Terrain Vehicles (UTV's), and drones.

Stump Treatments are used to apply herbicide directly to the cut portion of woody noxious weeds, such as Russian Olives and Tamarisk. This method reduces the amount of herbicide needed to control large woody species and is highly effective with minimal off-target impacts. This method includes the use of hand pump sprayers and sponge applicators.

Broadcast Spraying is used to treat large infestations for elimination and containment of noxious weeds. It is also used to prepare large priority areas identified by BCPOS staff for restoration. This method can also be used for emergency treatments in accordance with the Early Detection Rapid Response program outlined by the Colorado Department of Agriculture. Broadcast spraying is often the most effective and cost-effective method to control large noxious weed infestations because of size, type of infestation and nature of topography. Vegetation management for infrastructure and rights-of-way also requires the use of broadcast spraying for both maintenance and safety of structures. Broadcast spraying may be accomplished through different types of applications:

- **Backpack Sprayers** –utilized for smaller dense infestations of noxious weeds along rights of way and for infrastructure maintenance.
- **UTV Boom application** –utilized for smaller dense infestations of noxious weeds and rights of way and infrastructure maintenance.
- **Roadside Truck Boom** -utilized for controlling noxious weeds in roadside rights-of-way for prevention of further distribution and movement onto private lands.
- **Tractor Rig Application** –utilized when there is reasonable terrain that allows for the safety of the operator and safe operation of equipment.
- **Aerial Helicopter Applications*** –utilized when the topography of treatment areas become too severe for the safe operation of tractor rig application and creates concern for worker safety, or the treatment area is so large other methods become impractical; i.e., backpack spraying. See Appendix F for the Aerial Application Policy.
- **Drone Applications** – This type of application can be used in the same manner as helicopter applications and can provide smaller remote aerial applications on areas that cannot be accessed by other means. Refer to Appendix F, Aerial Application Policy, for more details.

The county’s herbicide spray buffers are determined by application method, location, and herbicide label, as summarized in Table 4.

TABLE 4: Chemical Tools

Method	Benefits	Challenges	Resources Required
Herbicide Application via spot treatments	<ul style="list-style-type: none"> • Selective application. • Effective method for several difficult to control species. 	<ul style="list-style-type: none"> • Impractical for large areas. • Potential off target impacts of desirable plants. • Weather conditions limit application windows • Resistance management 	<ul style="list-style-type: none"> • Herbicide • Staff time • Research • Special equipment • Training • Licenses • Personal Protective Equipment
Herbicide Application via broadcast ground treatments	<ul style="list-style-type: none"> • Effective method for several difficult to control species. • Covers large areas that require treatment. • Aids in restoration of historically disturbed sites. 	<ul style="list-style-type: none"> • Ability to get equipment into areas. • Potential off target impacts of desirable plants • Weather conditions limit application windows • Resistance management 	<ul style="list-style-type: none"> • Herbicide • Staff time • Research • Special equipment • Training • Licenses • Personal Protective Equipment

(Table 4: Chemical Tools cont.)

Method	Benefits	Challenges	Resources Required
Herbicide Application via broadcast aerial treatments	<ul style="list-style-type: none"> Covers large areas that require treatment. Ability to access difficult or dangerous terrain. Less risk for staff members. Minimal drift. 	<ul style="list-style-type: none"> Drift may occur if label or weather factors are not followed May cause noise for neighboring residents Weather conditions limit application windows 	<ul style="list-style-type: none"> Expensive outside contract Herbicide

Table 5: Herbicide Spray Buffers

Application Method	Distance from Private Property*
Backpack Sprayer	0 feet
UTV	2 feet
Roadside Truck	2 feet
Tractor	5 feet
Helicopter	See App. F: Aerial Application Policy
Drone	25 feet

**For noxious weeds that fall into the buffer zone, mechanical methods or spot application will be utilized.*

3.3.4 Biological Tools

Insect Biological Control – Biological weed control is an important component of the IWM program. The use of insects that can attack different areas of the plant in different stages of life can assist in suppressing noxious weed infestations. However, biological control agents are not utilized on species designated by the Commissioner for eradication. This is because this management objective requires the prevention of any seed development, and most field releases take three to five years for establishment of an insect population to become numerous enough to impact a noxious weed infestation. Eradication of a noxious weed species cannot be attained through insect biocontrol alone. The most effective scenario is the noxious weed infestation is suppressed to a “tolerable level,” where insect agents are significantly limiting distribution and abundance of the target noxious weed species, and the noxious weed density is no longer considered detrimental to the desired plant community.

TABLE 6: Biological Tools

Method	Benefits	Challenges	Resources Required
Insects	<ul style="list-style-type: none"> Suppress several species of noxious weeds 	<ul style="list-style-type: none"> Not available for all species Cannot be used in eradication efforts. Not always available for purchase – limited stock Do not work in all terrains, soil types, etc. 	<ul style="list-style-type: none"> Biological materials Staff time Insects are species specific

(Table 6: Biological Tools cont.)

Method	Benefits	Challenges	Resources Required
Rust	<ul style="list-style-type: none">• Suppress several species of noxious weeds	<ul style="list-style-type: none">• Not available for all species• Cannot be used in eradication efforts• Not always available for purchase – limited stock & current reclassification	<ul style="list-style-type: none">• Biological materials• Staff time

3.4 Record Keeping Requirements

Boulder County keeps pesticide application records in accordance with C.R.S. 35-10-111. This includes the collection and three-year retention of:

1. Name and address of person for whom application was made.
2. Location where application was made; location of a field should be fully described.
3. Target pest. This means the specific pest for which the application was made.
4. Site.
5. Specific pesticide applied. This shall be accomplished by recording the Environmental Protection Agency (EPA) registration number of the pesticide product.
6. Dilution rate. This is the amount of formulated product or active material per unit of volume of carrier specified as such. In the case of a product applied out of the container without mixing, the entry should be “no dilution.”
7. Application rate. This is the total gallons or pounds of the final tank mix applied per unit of area or volume.
8. Carrier, if other than water.
9. Date and time of application.
10. Name and license number of the person who made or supervised the application.
11. Endangered Species Protection Bulletin for the county and month in which the application was made for any pesticide product used, when required by the label. If there is not an active Endangered Species Bulletin use limitation for the county and month in which the application was made, no Endangered Species Protection Bulletin is required to be maintained in the applicator’s records.

3.5 Communication and Notification Processes

3.5.1 Application Notification on Public Lands and Rights-of-way

When applying herbicides to open public lands or rights-of-way, Boulder County will notify the public via the BCPOS Noxious Weed webpage.

- Rights-of-way applications: notification will be posted 24 hours in advance.
- Open Space applications in areas accessible to the public: notification will be posted by 8 a.m. the previous Friday morning.
- For trail applications: notification will be posted by the previous Friday morning by 8 am.
- Additionally, when herbicides are applied on any turf, ornamental, aquatic categories, or along trails, notice of application signs will be posted consistent with C.R.S. 35-10-112.

Application history is available on the website until the end of the calendar year of any specific application.

3.5.2 Registry of Pesticide-Sensitivity Persons Notification

Boulder County notifies all pesticide-sensitive persons per C.R.S 35-10-112 requirements. Which means applicators shall take reasonable actions to give notice of the date, approximate time, and address or location of the property to be treated for every turf or ornamental pesticide application at least 24 hours prior to the application to any persons whose name are on the published registry and their primary residence, primary place of employment, or principal school abutting the property being treated.

For more information on the Pesticide-Sensitive persons registry, visit [Pesticides | Department of Agriculture \(colorado.gov\)](https://pesticides.colorado.gov).

3.5.3 Aerial Application Notification Process

Notification of any drone or aerial application will follow the notification requirements set forth above in section 3.5.1.

Notification of any aerial application performed with a helicopter will be posted on the Boulder County [Invasive Plants & Weed Management on Open Space](#) webpage at least two weeks prior to application and included on the updated daily weeds hotline at 303-441-3940. Additionally, written notices in the form of postcards will be mailed to owners of any property within 1/8 mile of the edge of the application at least two weeks prior. Signs informing the public of the impending application will be posted on site or along public rights-of-way near site at least one week prior to application. Areas will be closed to the public during any aerial application, and notice of closure will be posted at least one week prior to application on the corresponding property webpage (properties that are open for recreation are listed on the [Parks & Trails](#) webpage).

See Appendix F, Aerial Application Policy, for more detailed information.

3.6 Training and Safety

Boulder County adheres to the regulations of C.R.S. 35-10-109, which includes:

- Certify all staff employees who may apply pesticides as field technicians.
- Require Certified Operators License for all Noxious Weed Workgroup Technicians
- Require Qualified Supervisor Licenses for all Noxious Weed Workgroup Specialists

The Boulder County Noxious Weed Group staff must maintain Qualified Supervisor License in the following categories:

- Agricultural Weed Control
- Rangeland Pest Control
- Industrial and Right-of-way Weed Control
- Aquatic Pest Control
- Forest Pest Control
- Turf Pest Control



4.0 Integrated Weed Management Plan Review Process

4.1 IWM Plan Review

The Boulder County Weed Coordinator, acting in their authorized function as the Boulder County Local Advisory Board, will review this IWM plan as needed but no less than every three years, as required by the Act.

4.2 Adaptive Management

As noted in section 1.3, Policy 3.03 of the Boulder County Comprehensive Plan Open Space Element states that “Boulder County monitors and evaluates uses and resources on open space to inform management decisions and seeks to be innovative in its approaches to on-the-ground management of open space resources utilizing knowledge of current conditions, latest science, and best technologies and practices.” In the context of integrated weed management, Boulder County conducts research and monitoring of selected weed management practices to evaluate their effectiveness and potential impacts. The data from these evaluations inform management objectives and tactics for the following season.

4.3 Annual Reports

Annually, the BCPOS Noxious Weed Workgroup summarizes the work completed pursuant to this IWM Plan on BCPOS lands and rights-of-way. This summary can be found in the BCPOS annual reports, [Annual Reports - Boulder County](#).

Additionally, the BCPOS Noxious Weed Workgroup will provide noxious weed infestation and distribution data to the Colorado Department of Agriculture for any species designated for eradication or any species that is undergoing a rule change under “Rules.”

4.4 Updating IWM Plan for Additional Noxious Weeds

Future List A noxious weed species which the Commissioner of the Department of Agriculture designates by rule pursuant to the Act shall be automatically incorporated into this IWM Plan without the need for the BOCC to amend the IWM Plan. Similarly, any deletions of species from List A or transfer of species from List A to Lists B or C, which the Commissioner of the Department of Agriculture accomplishes pursuant to the Act, shall be automatically incorporated into this IWM Plan without the need for the BOCC to amend the IWM Plan.

Future List B noxious weed species which the Commissioner of the Department of Agriculture designates by rule pursuant to the Act shall be automatically incorporated into this IWM Plan without the need for the BOCC to amend the IWM Plan. Similarly, any deletions of species from List B or transfer of species from List B to Lists A or C, which the Commissioner of the Department of Agriculture accomplishes pursuant to the Act, shall be automatically incorporated into this IWM Plan without the need for the BOCC to amend the IWM Plan.

Future List C noxious weed species that occur within the county, which the Commissioner of the Department of Agriculture designates by rule pursuant to the Act, shall be automatically incorporated into this IWM Plan, without the need for the BOCC to amend the IWM Plan. Similarly, any deletions of species from List C or transfer of species from List C to Lists B or A, which the Commissioner of the Department of Agriculture accomplishes pursuant to the Act, shall be automatically incorporated into this IWM Plan without the need for the BOCC to amend the IWM Plan. Management of List C species is currently recommended but not required by the

Commissioner of the Department of Agriculture and is at the discretion of the BOCC; therefore any future requirements for management of incorporated List C species shall be done by the BOCC through an amendment to this IWM Plan following a public hearing, with 30 days prior notice given to the public.

The BOCC reserves the right to designate local noxious weeds in the future, pursuant to amendment of the IWM Plan, following a public hearing, with 30 days prior notice given to the public. Any future designation of local noxious weeds shall include the required management objectives and associated management plans, methods, or techniques for all affected landowners.

APPENDIX A: Glossary of Terms

The following definitions shall apply to the terms used in this IWMP:

Act: the Colorado Noxious Weed Act, Article 5.5 of Title 35, C.R.S., as amended.

Adjacent: meeting or touching at some point or having nothing of the same kind intervening.

Agricultural Extension Agent: the agent in the Colorado State University Cooperative Extension office who provides weed education to the public and may assist in the development of individual noxious weed management plans.

Alien Plant: a plant species (exotic or invasive) which is not indigenous to the State of Colorado.

Biological Management: the use of an organism to disrupt the growth of noxious weeds.

Board: the Board of County Commissioners of Boulder County (BOCC).

Boulder County Community Planning & Permitting Department (CPP): Formerly called the County Land Use Department, employs the Director of Community Planning & Permitting and is authorized to assist the County Weed Coordinator and other authorized federal, state, and local noxious weed management officials as provided in this Plan.

Chemical Management: the use of herbicides to disrupt the growth of noxious weeds.

Colorado Noxious Weed Act: The Act, as defined above.

Commissioner: The Commissioner of the Colorado Department of Agriculture or the Commissioner's designee.

Compliance Waiver: a written exemption granted by the Commissioner to the county or a landowner that releases the county and/or landowner from certain obligations to eradicate a specific population of List A or List B noxious weed species.

Containment: see "Management Objective," below.

County: The County of Boulder (Boulder County).

County Weed Coordinator: The Weed Coordinator appointed by the Board, through the Director of the Boulder County Parks & Open Space (BCPOS) Department, to conduct the duties and functions of noxious weed management as specified under this IWM Plan.

Cultural Management: those methodologies or management practices conducted to favor the growth of desirable plants over noxious weeds, including but not limited to maintaining an optimum fertility and plant moisture status in the area, planting at optimum density and spatial arrangement in the area, and planting species and eco-types most suited to the area.

Elimination: see "Management Objective," below.

Environmental Impact Quotient (EIQ): Cornell University Herbicide Toxicity Management Tool that rates herbicide toxicity impacts in areas of worker safety, consumer safety and ecological safety.

Eradication: see "Management Objective," below.

Escaping Ornamental Plants: exotic horticultural plant species which invade other lands, becoming an ecological or economic nuisance to the present management goals of those lands.

Exotic: refers to a plant species that is non-native and may generally bring adverse effects to the ecological balance in an ecosystem

Federal Agency: each agency, bureau, or department of the federal government responsible for administering or managing federal land.

Federal Land Manager: the federal agency having jurisdiction over any federal lands affected by the Act.

Infestation: the presence of a large number of invasive plants on a site that causes displacement of native vegetation or negatively impacts native ecosystems or ecological functions.

Infested Acreage: an area of land containing a noxious weed species, defined by the actual perimeter of the infestation delineated by the canopy cover of the plants, and excluding areas not subject to infestation.

Integrated Weed Management (IWM): the planning and implementation of a coordinated program utilizing a variety of methods and tools to manage noxious weeds to achieve specified management objectives (control, suppress, contain, eradicate) and promote desirable plant communities. Such methods may include, but are not limited to, education, preventive measures, good stewardship; and the tools include biological, cultural, mechanical, and chemical controls.

Landowner: any owner of federal, tribal, state, county, municipal, or private land.

List A Noxious Weed Species: rare noxious weed species that are subject to eradication wherever detected statewide to protect neighboring lands and the state as a whole.

List B Noxious Weed Species: noxious weed species with discrete statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the Commissioner in order to stop the spread of these species.

List C Noxious Weed Species: widespread and well-established noxious weed species for which the Commissioner recommends but does not require management, although the Board may in its discretion require management.

Local Advisory Board: The Board of County Commissioners of Boulder County (BOCC), or such other entity as the Board may constitute to fulfill the role of the local advisory board under the Act.

Local Noxious Weed: any weed of local importance in the county which has been declared a noxious weed by the Board.

Management: any activity that prevents a plant from establishing, reproducing, or dispersing itself.

Management Objective: the specific, desired result of integrated management efforts, including:

- Control: management of the species is recommended but not required by the county or state.
- Eradication. Reducing the reproductive success of a noxious weed species or specified noxious weed population in largely un-infested regions to zero and permanently eliminating the species or population within a specified timeframe (the state specifies time frames for all listed weed species). Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted.
- Elimination. Removal or destruction of all emerged, growing plants of a population of List A or List B, List C species designated for eradication by the Commissioner of the Department of Agriculture or the Local Advisory Board. It is the first step in achieving eradication and is succeeded by efforts to detect and destroy newly emerged plants arising from seed, reproductive propagule, or remaining root stock for the duration of the seed longevity for the particular species.
- Containment. Maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely un-infested regions, where eradication activities prevail.
- Suppression. Reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands. Suppression efforts may employ a wide variety of integrated management techniques.
- Restoration. Removal of noxious weed species and reestablishment of desirable plant communities on lands of significant environmental or agricultural value to help restore or maintain said value.

Management Plan: a noxious weed management plan developed by any person, the Commissioner, or the Board, using integrated management techniques, methods, or practices.

Mechanical Management: those methodologies or management practices that physically disrupt plant growth, including but not limited to, tilling, mowing, burning, flooding, mulching, hand-pulling, grazing, and hoeing.

Municipality: a local governing body as set forth in C.R.S. Section 31-1-101(6).

Native Plant: a plant species which is indigenous to the state.

Neighboring: For Boulder County, a neighboring property is any property within a one-half mile radius of the boundary of the subject property.

Noxious Weed: a (alien, exotic or invasive) plant or parts of an alien plant that have been designated by rule as being noxious or have been declared to be a noxious weed by the Board and meets one or more of the following criteria:

- Aggressively invades or is detrimental to economic crops or native plant communities.
- Is poisonous to livestock.
- Is a carrier of detrimental insects, diseases, or parasites.
- Has a direct or indirect detrimental effect on the environmentally sound management of natural or agricultural ecosystems.

Noxious Weed Management: the planning and implementation of an integrated program to manage noxious weed species.

Occupant: see “Person,” below.

Person or Occupant: an individual, partnership, corporation, association, or federal, state, or local government or agency thereof owning, occupying, or controlling any land, easement, or rights-of-way, including but not limited to any city, county, state, or federally owned and controlled highway, drainage or irrigation ditch, spoil bank, borrow pit, gas and oil pipeline, high voltage electrical transmission line, or rights-of-way for a canal or lateral.

Restoration: see “Management Objective,” above.

Population: a group of designated noxious weeds of the same species occupying a particular geographic region and capable of interbreeding.

State: The State of Colorado.

Propagule: a part of a plant (such as a cutting, seed, or spore) that serves to propagate the plant (i.e., causes or allows the plant to reproduce).

State Noxious Weed Advisory Committee: A committee of 15 members appointed by the Commissioner of the Department of Agriculture to make recommendations on the designation of noxious weeds and to carry out related functions as specified in Section 35-5.5-108.7 of the Act.

State Weed Coordinator: a person within the Division of Conservation Services of the State Department of Agriculture whom the Commissioner designates to, among other functions, provide guidance to and coordinate with local government weed managers, such as the County Weed Coordinator, as provided for in Section 5-5.5-117 of the Act.

Suppression: see “Management Objective,” above.

Weed: any plant growing where it is unwanted.

APPENDIX B: 2022 Colorado Noxious Weed Act (Colorado Revised Code, Title 35 – Agriculture, Article 5.5)

35-5.5-101. Short Title

This article shall be known and may be cited as the “Colorado Noxious Weed Act”.

Source: L. 90: Entire article added, p. 1549, § 1, effective July 1. L. 96: Entire section amended, p. 763, § 3, effective May 23.

35-5.5-102. Legislative Declaration - Rule of Construction

In enacting this article the general assembly finds and declares that there is a need to ensure that all the lands of the state of Colorado, whether in private or public ownership, are protected by and subject to the jurisdiction of a local government empowered to manage undesirable plants as designated by the state of Colorado and the local governing body. In making such determination the general assembly hereby finds and declares that certain undesirable plants constitute a present threat to the continued economic and environmental value of the lands of the state and if present in any area of the state must be managed. It is the intent of the general assembly that the advisory commissions appointed by counties and municipalities under this article, in developing undesirable plant management plans, consider the elements of integrated management as defined in this article, as well as all appropriate and available control and management methods, seeking those methods which are least environmentally damaging and which are practical and economically reasonable.

(1.5) The general assembly hereby finds and declares that:

Noxious weeds have become a threat to the natural resources of Colorado, as thousands of acres of crop, rangeland, and habitat for wildlife and native plant communities are being destroyed by noxious weeds each year;

An organized and coordinated effort must be made to stop the spread of noxious weeds and that such an effort can best be facilitated by a state coordinator who will assist in building local coalitions and coordinate the efforts of state, federal, local, and private landowners in developing plans for the control of noxious weeds without unnecessarily disrupting the development of such lands;

The designation and classification of noxious weeds into categories for immediate eradication, containment, and suppression will further assist the state in coordinating efforts to stop the spread of noxious weeds;

Because the spread of noxious weeds can largely be attributed to the movement of seed and plant parts on motor vehicles, and because noxious weeds are becoming an increasing maintenance problem on highway rights-of-way in this state, additional resources are needed to fight the spread of noxious weeds; and

The use of moneys in the noxious weed management fund to assist local governing bodies and affected landowners in the eradication, containment, or suppression of noxious weeds best serves the citizens of Colorado.

2. This article is in addition to article 5 of this title and is intended to be an expansion of, not a substitution for, the provisions of said article 5.

35-5.5-103. Definitions

As used in this article, unless the context otherwise requires:

1. (Deleted by amendment, L. 96, p. 764 , § 5, effective May 23, 1996.)
 2. “Alien plant” means a plant species that is not indigenous to the state of Colorado.
 3. (Deleted by amendment, L. 96, p. 764 , § 5, effective May 23, 1996.)
 4. “Commissioner” means the commissioner of the department of agriculture or his or her designee.
- (4.5) “Department” means the department of agriculture.

5. "District" means a local governing body's geographic description of a land area where noxious weeds are to be managed.
6. (Deleted by amendment, L. 96, p. 764 , § 5, effective May 23, 1996.)
7. "Federal agency" means each agency, bureau, or department of the federal government responsible for administering or managing federal land.
8. "Federal land manager" means the federal agency having jurisdiction over any federal lands affected by the provisions of this article.
9. "Integrated management" means the planning and implementation of a coordinated program utilizing a variety of methods for managing noxious weeds, the purpose of which is to achieve specified management objectives and promote desirable plant communities. Such methods may include but are not limited to education, preventive measures, good stewardship, and the following techniques:
 - a. "Biological management", which means the use of an organism to disrupt the growth of noxious weeds.
 - b. "Chemical management", which means the use of herbicides or plant growth regulators to disrupt the growth of noxious weeds.
 - c. "Cultural management", which means methodologies or management practices that favor the growth of desirable plants over noxious weeds, including maintaining an optimum fertility and plant moisture status in an area, planting at optimum density and spatial arrangement in an area, and planting species most suited to an area.
 - d. "Mechanical management", which means methodologies or management practices that physically disrupt plant growth, including tilling, mowing, burning, flooding, mulching, hand-pulling, hoeing, and grazing.
10. "Landowner" means any owner of record of federal, tribal, state, county, municipal, or private land.

(10.5) "Local advisory board" means those individuals appointed by the local governing body to advise on matters of noxious weed management.
11. "Local governing body" means the board of county commissioners of a county, the city council of a city and county or statutory or home rule city, the board of trustees of a statutory town or home rule town, or the board of selectmen or city council of a territorial charter municipality, as the context so requires.

(11.4) "Local noxious weed" means any plant of local importance that has been declared a noxious weed by the local governing body.

(11.6) "Management" means any activity that prevents a plant from establishing, reproducing, or dispersing itself.

(11.7) "Management objective" means the specific, desired result of integrated management efforts and includes:

 - a. "Eradication" which means reducing the reproductive success of a noxious weed species or specified noxious weed population in largely un-infested regions to zero and permanently eliminating the species or population within a specified period of time. Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted.
 - b. "Containment" which means maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely un-infested regions, where eradication activities prevail.
 - c. "Suppression" which means reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands. Suppression efforts may employ a wide variety of integrated management techniques.

- d. "Restoration" which means the removal of noxious weed species and reestablishment of desirable plant communities on lands of significant environmental or agricultural value in order to help restore or maintain said value.
- 12. "Management plan" means the noxious weed management plan developed by any person or the local advisory board using integrated management.
- 13. (Deleted by amendment, L. 96, p. 764 , § 5, effective May 23, 1996.)
- 14. "Municipality" has the meaning set forth in section 31-1-101 (6), C.R.S.
- 15. "Native plant" means a plant species that is indigenous to the state of Colorado.
- 16. "Noxious weed" means an alien plant or parts of an alien plant that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board, and meets one or more of the following criteria:
 - a. Aggressively invades or is detrimental to economic crops or native plant communities;
 - b. Is poisonous to livestock;
 - c. Is a carrier of detrimental insects, diseases, or parasites;
 - d. The direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.

(16.2) "Noxious weed management" means the planning and implementation of an integrated program to manage noxious weed species.
- 17. "Person" or "occupant" means an individual, partnership, corporation, association, or federal, state, or local government or agency thereof owning, occupying, or controlling any land, easement, or right-of-way, including any city, county, state, or federally owned and controlled highway, drainage or irrigation ditch, spoil bank, borrow pit, gas and oil pipeline, high voltage electrical transmission line, or right-of-way for a canal or lateral.
- 18. "Plant growth regulator" means a substance used for controlling or modifying plant growth processes without appreciable phytotoxic effect at the dosage applied.

(18.5) "State noxious weed" means any noxious weed identified by the commissioner by rule after notifying and consulting with the state noxious weed advisory committee created in section 35-5.5-108.7.

(18.6) "State weed coordinator" means the state weed coordinator under contract with or appointed by the commissioner pursuant to section 35-5.5-117.
- 19. and 20. (Deleted by amendment, L. 96, p. 764 , § 5, effective May 23, 1996.)
- 21. "Weed" means any undesirable plant.

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35-5.5-104. Duty to Manage Noxious Weeds

It is the duty of all persons to use integrated methods to manage noxious weeds if the same are likely to be materially damaging to the land of neighboring landowners.

35-5.5-104.5. Intentional Introduction, Cultivation, or Sale of Noxious Weeds – Costs

- 1.
 - a. It shall be unlawful to intentionally introduce, cultivate, sell, offer for sale, or knowingly allow to grow in violation of this article or any rule promulgated hereunder in this state any noxious weed designated pursuant to section 35-5.5-108 (2)(a); except that this prohibition shall not apply to:

- I. Research sanctioned by a state or federal agency or an accredited university or college;
 - II. Activities specifically permitted by the commissioner;
 - III. Noxious weed management plans that are part of an approved reclamation plan pursuant to section 34-32-116 (7) or 34-32.5-116 (4), C.R.S.;
 - IV. Noxious weed management activities that are conducted on disturbed lands as part of an approved reclamation plan pursuant to section 34-33-111 (1), C.R.S.; or
 - V. Noxious weed management activities that are part of activities conducted on disturbed lands pursuant to section 34-60-106 (12), C.R.S.
- b. It shall not be a violation of this section for a person to knowingly allow to grow a state noxious weed that is being properly managed in accordance with the rules promulgated by the commissioner.
2. Any entity or person that violates the provisions of this section shall be responsible for the costs associated with remediation of the noxious weeds. In assessing the cost of remediation, the commissioner may include both actual immediate and estimated future costs to achieve specified management objectives.

35-5.5-105. Noxious Weed Management - Powers of County Commissioners

1. The board of county commissioners of each county in the state shall adopt a noxious weed management plan for all of the unincorporated lands within the county. Such plan shall include all of the requirements and duties imposed by this article. Guidelines may be included that address no pesticide noxious weed management plans. In addition to and not in limitation of the powers delegated to boards of county commissioners in section 30-11-107 and article 15 of title 30, C.R.S., article 5 of this title, and elsewhere as provided by law, the board of county commissioners may adopt and provide for the enforcement of such ordinances, resolutions, rules, and other regulations as may be necessary and proper to enforce said plan and otherwise provide for the management of noxious weeds within the county, subject to the following limitation: No county ordinance, rule, resolution, other regulation, or exercise of power pursuant to this article shall apply within the corporate limits of any incorporated municipality, nor to any municipal service, function, facility, or property, whether owned by or leased to the incorporated municipality outside the municipal boundaries unless the county and municipality agree otherwise pursuant to part 2 of article 1 of title 29, C.R.S., or article 20 of title 29, C.R.S.

35-5.5-106. Noxious Weed Management - Municipal Authority

1. The governing body of each municipality in the state shall adopt a noxious weed management plan for all lands within the territorial limits of the municipality. In addition to and independent of the powers elsewhere delegated by law, the governing body of a municipality may adopt and provide for the enforcement of such ordinances, resolutions, rules, and other regulations as may be necessary and proper to enforce said plan and otherwise provide for the management of noxious weeds within the municipality, subject to the following limitation: No municipal ordinance, resolution, rule, other regulation, or exercise of power pursuant to this article shall apply to unincorporated lands or facilities outside the corporate limits of the municipality, except such lands or facilities which are owned by or leased to the municipality, unless the municipality and the county otherwise agree pursuant to part 2 of article 1 of title 29, C.R.S., or article 20 of title 29, C.R.S.
2. The governing body of the municipality shall provide for the administration of the noxious weed management plan authorized by this article through the use of agents, delegates, or employees and may hire additional staff or provide for the performance of all or part of the noxious weed management plan through outside contract. Any agent, delegate, employee, staff, or contractor applying or recommending the use of chemical management methods shall be certified by the department of agriculture for such application or recommendation.
3. The governing body may cooperate with counties and other municipalities for the exercise of any or all of the powers and authorities granted by this article. Such cooperation shall take the form of an intergovernmental agreement pursuant to part 2 of article 1 of title 29, C.R.S., or article 20 of title 29, C.R.S.

4. To the degree that a municipality has, upon enactment of this article, or subsequent to that date, adopted an ordinance or ordinances for the management of noxious weeds, the adoption of such an ordinance or ordinances shall be deemed to satisfy the requirement for the adoption of a noxious weed management plan imposed by this article.

35-5.5-107. Local Advisory Board - Formation - Duties

1. The governing body of each county and municipality shall appoint a local advisory board. The local governing body, at its sole option, may appoint itself, or a commission of landowners, to act as the local advisory board for that jurisdiction. The members of each local advisory board shall be residents of the unincorporated portion of the county or residents of the municipality, as the case may be, and in the case of a county, at least a majority of the members of the local advisory board shall be landowners of over forty acres.
2. In the event a county or municipality elects to cooperate with another county or municipality for any of the purposes set forth in this article, the membership of the local advisory board shall be determined by the governing bodies of such cooperating local governments.
3. Each local advisory board shall annually elect a chairman and secretary. A majority of the members of the board shall constitute a quorum for the conduct of business.
4. Local advisory boards shall have the power and duty to:
 - a. Develop a recommended management plan for the integrated management of designated noxious weeds and recommended management criteria for noxious weeds within the area governed by the local government or governments appointing the local advisory board. The management plan shall be reviewed at regular intervals but not less often than once every three years by the local advisory board. The management plan and any amendments made thereto shall be transmitted to the local governing body for approval, modification, or rejection.
 - b. Declare noxious weeds and any state noxious weeds designated by rule to be subject to integrated management;
 - c. Recommend to the local governing body that identified landowners be required to submit an individual integrated management plan to manage noxious weeds on their property.
5. The local governing body shall have the sole and final authority to approve, modify, or reject the management plan, management criteria, management practice, and any other decision or recommendation of the local advisory board.
6. The state weed coordinator shall review any recommendations of a local advisory board appointed pursuant to article 5 of this title and note any inconsistencies between the recommendations of the state weed coordinator or the commissioner and any such local advisory board.

35-5.5-108. Designated Noxious Weeds - Rules - Legislative Declaration

1. The general assembly hereby finds and declares that the noxious weeds designated by rule are a present threat to the economic and environmental value of the lands of the state of Colorado and declare it to be a matter of statewide importance that the governing bodies of counties and municipalities include plans to manage such weeds as part of their duties pursuant to this article.
2.
 - a. The state list of plant species that are designated as noxious weeds shall be designated by rule and shall be managed under the provisions of this article. On and after August 6, 2003, the commissioner shall classify noxious weeds into one of a minimum of three categories, including:
 - I. "List A", which means rare noxious weed species that are subject to eradication wherever detected statewide in order to protect neighboring lands and the state as a whole;
 - II. "List B", which means noxious weed species with discrete statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the commissioner in

order to stop the continued spread of these species;

III. "List C", which means widespread and well-established noxious weed species for which control is recommended but not required by the state, although local governing bodies may require management.

b. A local governing body may adopt eradication, containment, or suppression standards that are more stringent than the standards adopted by the commissioner.

(2.1) The commissioner shall review and revise, as necessary, the state noxious weed list at least once every three years.

(2.3) The commissioner shall develop and implement by rule state noxious weed management plans for noxious weed species classified as list A or list B species. For each noxious weed species, each management plan shall designate the management objectives for all lands of the state appropriate to achieve the stated purpose of the species classification.

(2.5) The commissioner shall prescribe integrated management techniques to achieve specified management objectives for each listed species after consulting with the state noxious weed advisory committee. The prescribed management techniques shall be mandatory techniques for list A species and populations of list B species designated for eradication. The commissioner shall develop management techniques pursuant to science-based methodologies, peer reviewed studies, or any other method that is based on credible research.

(2.6) The classifications made pursuant to paragraph (a) of subsection (2) of this section shall primarily reflect the known distribution of the designated species, the feasibility of current control technologies to achieve specified management objectives, and the costs of carrying out the prescribed state weed management plan.

c. (2.7) (a) The commissioner shall also adopt rules for granting compliance waivers to local governing bodies and landowners; except that a waiver may not be granted to the affected landowner when a landowner has willfully or wantonly violated the provisions of this section or section 35-5.5-104.5 or 35-5.5-108.5 attempts to delay eradication of a species without just cause.

d. Such rules shall include:

I. A process by which a local governing body or an affected landowner may petition the commissioner to change the management objectives specified in a state noxious weed management plan;

II. The criteria used to evaluate such petitions; and

III. Time frames in which the commissioner shall grant or deny such petitions.

e. Actions sufficient to implement the management objective for a noxious weed species shall continue until the commissioner grants a waiver pursuant to this subsection (2.7).

3. The board of county commissioners or governing body of a municipality may declare additional noxious weeds, within its jurisdictional boundaries, after a public hearing with thirty days prior notice to the public. Any declaration of additional noxious weeds pursuant to this subsection (3) shall include the management objectives for all affected landowners.

35-5.5-108.5. Responsibilities Related to Eradication of Designated Noxious Weeds - Commissioner - Local Governing Bodies - Affected Landowners

1. This section shall apply to noxious weeds that have been classified as list A species and to populations of list B species designated for eradication pursuant to section 35-5.5-108 (2)(a). This section shall govern the responsibilities of the commissioner, local governing bodies, and affected landowners.

2. Duties of commissioner.

a. The commissioner may enforce the provisions of this section as necessary to ensure the cooperation of local governing bodies and affected landowners.

b. The commissioner shall provide:

- I. Educational resources to local governing bodies and affected landowners regarding the eradication of list A species and populations of list B species designated for eradication. Such education shall include an explanation of why the species has been listed for eradication, the prescribed techniques for eradication in the most cost-effective manner, and the duties of the local governing body and affected landowner regarding such eradication.
 - II. Financial or in-kind resources to local governing bodies or affected landowners to eradicate list A species and populations of list B species designated for eradication from the available moneys in the noxious weed management fund created in section 35-5.5-116. Such financial or in-kind resource allocation shall be determined by the commissioner according to the identified benefits to the citizens of Colorado, the surrounding community, and the affected landowners.
 - III. The inventory and mapping infrastructure necessary to facilitate the classification of state noxious weeds and the development and implementation of state noxious weed management plans.
3. **Duties of local governing bodies.**
- a. **In compliance with the rules promulgated by the commissioner, a local governing body shall initiate and maintain communications with landowners who are affected by list A species and populations of list B species designated for eradication by the commissioner.**
 - b. **In addition to the existing powers and duties of a local governing body provided in this article a local governing body shall:**
 - I. Provide affected land owners with technical assistance for the eradication of list A species and populations of list B species designated for eradication by the commissioner;
 - II. Carry out sufficient measures, including project oversight and enforcement, as may be necessary to ensure the eradication of list A species and populations of list B species designated for eradication by the commissioner;
 - III. Provide the commissioner with assistance in disseminating financial resources to affected landowners and mapping data pursuant to rules promulgated by the commissioner; and
 - IV. Determine the cost of eradication to be borne by affected landowners.
 - c. **Local governing bodies may apply to the commissioner for a waiver of compliance with an eradication designation pursuant to section 35-5.5-108 (2.7).**
 - d. **If the commissioner determines, in consultation with the local governing body, that the most cost-effective manner to eradicate designated noxious weeds is for the commissioner to implement an eradication program, the commissioner may implement the eradication program directly.**
4. **Duties of affected landowners or occupants. Except as provided pursuant to section 35-5.5-104.5 (1)(a), an affected landowner or occupant whose property may be affected by list A species or by populations of list B species designated for eradication shall allow the commissioner or local weed control officials access to such property for the purpose of immediate inspection and eradication when at least one of the following events has occurred:**
- a. The affected landowner or occupant has requested the inspection;
 - b. A neighboring landowner or occupant has reported a suspected noxious weed infestation and requested an inspection; or
 - c. An authorized agent of the local government or commissioner has made a visual observation from a public right-of-way or area and has reason to believe that a noxious weed infestation exists.
- 5.
- a. **If verbal permission to inspect the land by the affected landowner is not obtained, no entry upon any premises, lands, or places shall be permitted until the local governing body has notified the affected landowner that such inspection is pending by certified mail if the landowner's mailing address is within the United States or mailed in a comparable manner to a landowner whose mailing address is**

outside of the United States. Where possible, inspections shall be scheduled and conducted with the concurrence of the affected landowner or occupant. A local governing body may notify an affected landowner in an electronic format, in addition to notice by certified mail.

b.

- I. If, after ten days with no response from the affected landowner or upon denial of access before the expiration of ten days, the inspector may seek an inspection warrant issued by a municipal, county, or district court having jurisdiction over the land. The court shall issue an inspection warrant upon presentation by the local governing body of an affidavit stating:
 - A. The information that gives the inspector reasonable cause to believe that any provision of this section, section 35-5.5-104.5, or section 35-5.5-108, is being or has been violated;
 - B. The affected landowner has failed to respond or the landowner or occupant has denied access to the inspector; and
 - C. A general description of the location of the affected land.
- II. No affected landowner or occupant shall deny access to an authorized agent of the local governing body or the commissioner in possession of an inspection warrant.

6. An affected landowner shall notify a lessee or occupant of affected lands of all notices of inspection and eradication efforts on such lands as soon as practicable.
7. The local governing body of the county or municipality having jurisdiction over private and public lands on which list A species or populations of list B species designated for eradication are found shall notify the affected landowner or occupant of such lands by certified mail if the landowner's mailing address is within the United States or mailed in a comparable manner to a landowner whose mailing address is outside of the United States. The notice shall name the noxious weeds, identify eradication as the required management objective, advise the affected landowner or occupant to commence eradication efforts within a specified period or condition, and state the integrated weed management techniques prescribed by the commissioner for eradication. Where possible, the local governing body shall consult with the affected landowner or occupant in the development of a plan for the eradication of noxious weeds on the premises or land.
8. Within five days after the local governing body mails notification, the landowner shall comply with the terms of the notification or submit an acceptable plan and schedule for the completion of the management objective.
9.
 - a. In the event the affected landowner or occupant fails to comply with the notice to eradicate the identified noxious weeds and implement an appropriate eradication program, the local governing body having authority over the public or private land shall:

(I) Provide for and complete the eradication of such noxious weeds at such time, upon such notice, and in such manner consistent with achieving the management objective as the local governing body deems appropriate; and

(II) Do one of the following:

- I. Assess the whole cost of the eradication, including up to one hundred percent of inspection, eradication, and other incidental costs in connection with eradication, upon the lot or tract of land where the noxious weeds are located; except that no local governing body shall levy a tax lien against land it administers as a part of a public right-of-way. Such assessment shall be a lien against each lot or tract of land until paid and shall have priority over all other liens except general taxes and prior special assessments. Such assessment may be certified to the county treasurer of the county in which the property is located and collected and paid over in the same manner as provided for the collection of taxes. Any funds collected pursuant to this section shall be utilized in furtherance of the local governing body's weed management efforts.

- b. If after receiving notice that an inspection is pending the landowner or occupant denies access to the inspector of the local governing body, the inspector may seek an inspection warrant issued by a municipal, county, or district court having jurisdiction over the land. The court shall issue an inspection warrant upon presentation by the local governing body, through its agent or employee, of an affidavit stating: The information which gives the inspector reasonable cause to believe that any provision of this article is being or has been violated; that the occupant or landowner has denied access to the inspector; and a general description of the location of the affected land. No landowner or occupant shall deny access to such land when presented with an inspection warrant.
3. The local governing body of the county or municipality having jurisdiction over private lands upon which noxious weeds are found shall have the authority, acting directly or indirectly through its agent or staff, to notify the landowner or occupant of such lands, advising the landowner or occupant of the presence of noxious weeds. Said notice shall name the noxious weeds, advise the landowner or occupant to manage the noxious weeds, and specify the best available control methods of integrated management. Where possible, the local governing body shall consult with the affected landowner or occupant in the development of a plan for the management of noxious weeds on the premises or lands.
4.
 - a. Within a reasonable time after receipt of notification, which at no time shall exceed ten days, the landowner or occupant shall either:
 - I. Comply with the terms of the notification;
 - II. Acknowledge the terms of the notification and submit an acceptable plan and schedule for the completion of the plan for compliance; or
 - III. Request an arbitration panel to determine the final management plan.
 - b. The arbitration panel selected by the local governing body shall be comprised of a weed management specialist or weed scientist, a landowner of similar land in the same county, and a third panel member chosen by agreement of the first two panel members. The landowner or occupant shall be entitled to challenge any one member of the panel, and the local governing body shall name a new panel member from the same category. The decision of the arbitration panel shall be final.
5.
 - a. In the event the landowner or occupant fails to comply with the notice to manage the identified noxious weeds or implement the plan developed by the arbitration panel, the local governing body has the authority to:
 - I. Provide for and compel the management of such noxious weeds at such time, upon such notice, and in such manner as the local governing body shall prescribe by ordinance or resolution; and
 - II. Assess the whole cost thereof, including up to twenty percent for inspection and other incidental costs in connection therewith, upon the lot or tract of land where the noxious weeds are located; except that no local governing body shall levy a tax lien against land it administers as part of a public right-of-way. Such assessment shall be a lien against each lot or tract of land until paid and shall have priority over all other liens except general taxes and prior special assessments. Such assessment may be certified to the county treasurer of the county in which the property is located and collected and paid over in the same manner as provided for the collection of taxes. Any funds collected pursuant to this section shall be deposited in the local governing body's weed fund or any similar fund.
 - b. No local governing body shall provide for or compel the management of noxious weeds on private property pursuant to this subsection (5) without first applying the same or greater management measures to any land or rights-of-way owned or administered by the local governing body that are adjacent to the private property.
 - c. No local governing body shall assess the cost of providing for or compelling the management of noxious weeds on private property until the level of management called for in the notice or the

management plan developed by the arbitration panel has been successfully achieved.

6. The local governing body, through its delegates, agents, and employees, shall have the right to enter upon any premises, lands, or places, whether public or private, during reasonable business hours for the purpose of ensuring compliance with the requirements of this article concerning noxious weed management and any other local requirements.
7. No agent, employee, or delegate of a local governing body shall have a civil cause of action against a landowner or occupant for personal injury or property damage incurred while on public or private land for purposes consistent with this article except when such damages were willfully or deliberately caused by the landowner.

35-5.5-110. Public Lands - Control of Undesirable Plants - Charges

1. It is the duty of each state board, department, or agency that administers or supervises state lands to manage noxious weeds on any lands under its jurisdiction using the methods prescribed by the local governing body in whose jurisdiction such state lands are located. The local governing body may give notice to any such state board, department, or agency advising of the presence of noxious weeds and naming them. Such notice shall specify the best available methods of integrated management that are not in conflict with federal law or contractual restrictions included in federal land conveyances to the state. Wherever possible, the local governing body shall consult with the affected state board, department, or agency in the development of a plan for the management of noxious weeds on the premises or lands.
2.
 - a. Within a reasonable time after receipt of notification, which at no time shall exceed ten days, the state board, department, or agency shall do one of the following:
 - I. Comply with the terms of the notification;
 - II. Acknowledge the terms of the notification and submit an acceptable plan and schedule for the completion of the plan for compliance;
 - III. Request an arbitration panel to determine the final management plan.
 - b. The arbitration panel selected by the local governing body shall be comprised of a weed management specialist or weed scientist, a landowner of similar land in the same county, and a third panel member chosen by agreement of the first two panel members. The state board, department, or agency shall be entitled to challenge any one member of the panel, and the local governing body shall name a new panel member from the same category. The decision of the arbitration panel shall be final.
3. In the event the state board, department, or agency fails to comply with the notice to manage the identified noxious weeds or implement the plan developed by the arbitration panel, the local governing body in whose jurisdiction the infestation is located may enter upon such lands and undertake the management of such noxious weeds or cause the same to be done, the expense thereof to be a proper charge against said state board, department, or agency which has jurisdiction over the lands. An agreement for payment shall be reached within two weeks after the date such an expense is submitted, with respect to the amount of reimbursement to be paid. Such agreement shall be in writing. If no agreement has been reached and if the charge is not immediately paid, such charge shall be submitted to the controller, who shall treat such amount as an encumbrance on the budget of the state board, department, or agency involved, or such charge may be recovered in any court with jurisdiction over such lands. Any state board, department, or agency may enter into a contract with the local governing body to authorize the management of noxious weeds on state-administered land on terms and conditions satisfactory to both parties.
4. In addition to the requirements of subsection (3) of this section, the division shall enter into agreements with local governing bodies for the control of weeds on any property the division owns in fee title or has effective surface control over pursuant to a long-term lease or easement agreement. For purposes of this subsection (4) and subsection (5) of this section, "long-term lease or easement agreement" means any lease

or easement agreement that exceeds ten years. Agreements between the division and local governing bodies for weed control shall describe the terms and conditions of weed control, provide an annual estimated budget for such weed control, and identify specific weed control responsibilities for the division and the property owner, if different than the division. Weed control agreements required pursuant to this subsection (4) shall be executed on or before July 1, 1997.

5. Any weed control expense incurred by a local governing body pursuant to subsection (3) of this section on any lands held by the division in fee title or by long-term lease or easement agreement, as described in subsection (4) of this section, and for which a weed control agreement as described in subsection (4) of this section has been signed, and which costs are in accordance with that long-term agreement, shall be deemed correct and final and shall be paid by the division pursuant to section 33-1-110 (6.5), C.R.S.

35-5.5-111. Cooperation With Federal and State Agencies

The local governing bodies of all counties and municipalities in this state are hereby authorized to enter into cooperative agreements with federal and state agencies for the integrated management of noxious weeds within their respective territorial jurisdictions.

35-5.5-112. Public Rights-of-Way - Management of Noxious Weeds - Charges

It shall be the duty of each local governing body and each state board, department, or agency to confirm that all public roads, public highways, public rights-of-way, and any easements appurtenant thereto, under the jurisdiction of each such entity, are in compliance with this article, and any violations of this article shall be the financial responsibility of the appropriate local governing body or state board, department, or agency.

35-5.5-113. Public Nuisance - Abatement

All noxious weeds, at any and all stages, their carriers, and any and all premises, plants, and things infested or exposed to infestation therewith may be declared to be a public nuisance by the local governing body having jurisdiction over the lands upon which said noxious weeds are situated. Once declared, such nuisances are subject to all laws and remedies relating to the prevention and abatement of nuisances. The local governing body, in a summary manner or otherwise, may take such action, including removal and destruction, with reference to such nuisance as in its discretion appears necessary. The remedies of this section shall be in addition to all other remedies provided by law.

35-5.5-114.1. Survey of Compliance on Federal Land

On or before January 1, 1998, the state weed coordinator shall survey those counties that include significant amounts of federal land to determine the level of cooperation and compliance by the federal government with this article.

35-5.5-115. Rules

The commissioner shall promulgate rules as necessary to carry out the purposes of this article, which rules shall include a designation of state noxious weeds.

35-5.5-116. Noxious Weed Management Fund - Creation - Allocation of Funds

1. There is hereby created in the office of the state treasurer the noxious weed management fund. The fund consists of any civil penalties collected pursuant to section 35-5.5-118; any gifts, donations, and grants received pursuant to section 35-1-104 (1)(cc); and any moneys appropriated or transferred thereto by the general assembly. All interest derived from the deposit and investment of moneys in the fund shall be credited to the fund. The general assembly shall annually appropriate state moneys in the fund to the department of agriculture for the purposes specified in this section. Any unexpended and unencumbered moneys from an appropriation from the fund remain available for expenditure by the department in the next fiscal year without further appropriation.
2. The interest earned on moneys in the noxious weed management fund and appropriated to the department of agriculture shall be expended for costs incurred by the department of agriculture in administering this article, and any moneys appropriated that exceed the amount needed for such costs

may be expended for noxious weed management projects in accordance with this section.

3. The department may expend moneys through grants or contracts to communities, weed control districts, or other entities it considers appropriate for noxious weed management projects.
4. The department may expend moneys for the following purposes:
 - a. Noxious weed management programs with local weed control districts, if expenses are shared with such districts;
 - b. With the approval of the agricultural commission, the department may make special grants to local weed control districts to eradicate or contain state noxious weeds, which grants may be issued without matching funds from the district;
 - c. Administrative expenses incurred by the department;
 - d. Any project the agricultural commission determines will significantly contribute to the management of noxious weeds within the state;
 - e. With the approval of the agricultural commission, grants to the Colorado state university cooperative extension service, the Colorado state university experiment station, and universities for weed management research, evaluation, and education;
 - f. Employment of a new and innovative noxious weed management project or the development, implementation, or demonstration of any noxious weed management project that may be proposed, implemented, or established by local, state, or national organizations, whether public or private. Such expenditures shall be shared with such organizations.
5. If a new and potentially harmful noxious weed is discovered growing in the state and its presence is verified by the department, the governor may declare a noxious weed emergency. In the absence of necessary funding from other sources, the department is authorized to allocate up to fifty thousand dollars of the principal in the noxious weed management fund to government agencies for emergency relief to manage or confine the new noxious weed species.

35-5.5-117. The State Weed Coordinator

There shall be designated in the department of agriculture a state weed coordinator, who shall be under contract with or appointed by the commissioner.

1. The state weed coordinator shall:
 - a. Develop a recommended management plan for the integrated management of designated noxious weeds within state-owned lands.
 - b. Facilitate cooperation between federal, state, and local land managers in the formation of a memorandum of understanding.
 - c. Provide guidance and coordination for local governmental weed managers.

35-5.5-118. Civil Penalties

1.
 - a. Any person who violates this article or any rule adopted pursuant to this article is subject to a civil penalty, as determined by the commissioner. The penalty shall not exceed one thousand dollars per violation; except that such penalty may be doubled if it is determined that the person has violated the provision or rule more than once. No civil penalty shall be imposed unless and until the person charged is given notice and opportunity for a hearing pursuant to article 4 of title 24, C.R.S.
 - b. In addition to any civil penalties assessed pursuant to paragraph (a) of this subsection (1), any person who violates the provisions of section 35-5.5-104.5, 35-5.5-108, or 35-5.5-108.5, or any rule adopted to implement these sections, shall, upon an order of the commissioner, pay the cost of inspection and eradication of list A or list B noxious weed species, including, but not limited to, any immediate remediation costs, the estimated cost of future eradication, any administrative costs, and any court

cost and attorney fees incurred by the commissioner in enforcing section 35-5.5-104.5, 35-5.5-108, or 35-5.5-108.5, or any rule adopted to implement these sections. The commissioner may not enforce such order unless and until the person charged is given notice and opportunity for a hearing pursuant to article 4 of title 24, C.R.S. All moneys due and owing pursuant to this paragraph (b) shall be payable to the department for the payment and reimbursement of enforcement and costs associated with such enforcement and are hereby continuously appropriated to the department for such purpose.

2. If the commissioner is unable to collect a civil penalty, payment of costs imposed pursuant to subsection (1) of this section, or if the person fails to pay all or a specified portion of such penalty or payment, the department may bring suit in any court of competent jurisdiction to recover such amount plus costs and attorney fees.
3. Before imposing any civil penalty or payment of costs, the commissioner may consider the effect of such penalty or payment of costs on the ability of the person charged to stay in business.
4. All civil penalties and payment of costs collected pursuant to this section shall be deposited in the noxious weed management fund created in section 35-5.5-116.

35-5.5-119. County Funding

The board of county commissioners is authorized to levy a special tax, subject to the approval of the voters, upon every dollar of valuation of assessment of taxable property within the county for the purpose of creating a county fund to control noxious weeds; except that the amount raised from such levy in any one year shall not exceed the amount raised by five mills.

APPENDIX C: Management Plan for Boulder County List C and Local Noxious Weeds

The authority to create management plans for List C and Local Noxious Weeds is granted under **C.R.S 35-5.5-107** and **C.R.S 35-5.5-108**.

State List	Boulder County List	Common Name	Known Amount in Boulder County	Level of Management required
C	C	Bulbus Bluegrass	Unknown – Scattered	Control on private property Elimination on Boulder County lands, rights-of-way
C	C	Chicory	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Common Burdock	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Common Mullein	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Common St. Johnswort	Scattered – Small	Control on private property Elimination on Boulder County Land, rights-of-way
C	C	Downy Brome	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Field Bindweed	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Perennial Sowthistle	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Poison Hemlock	Scattered – Small	Control on private property Suppression on Boulder County lands, rights-of-way
C	C	Puncturevine	Widespread	Control
C	C	Redstem filaree	Widespread	Control
C	C	Siberian Elm	Scattered – Dense	Control on private property Elimination on Boulder County land, rights-of-way
C	C	Tree of Heaven	Scattered – Dense	Control on private property Elimination on Boulder County land, rights-of-way
C	C	Velvet Leaf	Unknown	Control
Watchlist	Local	Common Reed	Scattered	Control on private property Elimination on Boulder County land, rights-of-way

State List	Boulder County List	Common Name	Known Amount in Boulder County	Level of Management required
Watchlist	Local	Hoary Alyssum	Scattered	Control on private property Suppression on Boulder County land, rights-of-way
Watchlist	Local	Garlic Mustard	Scattered- Small	Control on private property Elimination on Boulder County land, rights-of-way
Watchlist	Local	Garden Loosestrife	Scattered-Small	Control on private property Elimination on Boulder County land, rights-of-way
Watchlist	Local	Meadow hawkweed	Scattered	Control on private property Elimination on Boulder County land, rights-of-way
Watchlist	Local	Perennial Sweet Pea	Dense	Control on private property Suppression on Boulder County lands, rights-of-way
Watchlist	Local	Tall Oatgrass	Small	Control on private property Elimination on Boulder county land and rights-of-way
N/A	Local	Kochia	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
N/A	Local	Curly Dock	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
N/A	Local	Smooth Brome	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
N/A	Local	Blue Mustard	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
N/A	Local	Wild Lettuce	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way
N/A	Local	Crack Willow	Widespread	Control on private property Elimination on Boulder County lands, rights-of-way
N/A	Local	Russian Thistle	Widespread	Control on private property Suppression on Boulder County lands, rights-of-way

W = Colorado Department of Agriculture Noxious Weed Watchlist

Management Objective: the specific, desired result of integrated management efforts, including:

Eradication: reducing the reproductive success of a noxious weed species or specified noxious weed population in largely un-infested regions to zero and permanently eliminating the species or population within a specified timeframe. Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted.

Elimination: the removal or destruction of all emerged, growing plants of a population of a listed species designated for eradication by the Local Advisory Board. It is the first step in achieving eradication and is succeeded by efforts to detect and destroy newly emerged plants arising from seed, reproductive propagule, or remaining root stock for the duration of the seed longevity for each species.

Containment: maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely un-infested regions, where eradication activities prevail.

Suppression: reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands. Suppression efforts may employ a wide variety of integrated management techniques.

Control: management of the species is recommended but not required by the county or state.

APPENDIX D: Herbicide Use Tables

The following three tables provide information about the herbicides used by Boulder County, including a description (based on product label), environmental impact quotient (EIQ) and field utilization rate (FUR) (see Appendix E for detailed explanation of EIQ and EIQ-FUR), and explanation of where the product is used, for which plants, and application method. Use sites refer to roadside rights-of-way, parking lots, open space or natural areas, range lands and turf grass. Application may be targeted spot applications and targeted broadcast applications for individual plant treatments up to small grouping of plants within a larger overall area. Application methods include backpack sprayer, hand-held hose or small boom sprayers with utility terrain vehicles. Broadcast applications refer to areas of greater than 2 acres (may be within a larger treatment area) and are applied with a tractor boom sprayer. Aerial broadcast applications are typically treatment areas greater than 200 acres, usually located in inaccessible areas.

Table D-1 shows the herbicides used most commonly by Boulder County, due to their effectiveness and low toxicity. Table D-2 is a list of select chemicals used less frequently due to efficacy with certain weeds or market availability. Table D-3 is a list of the herbicides used least frequently; these are reserved for special cases due to resistance or site conditions. Boulder County utilizes herbicides with the lowest environmental impact values as assigned by the EIQ Calculator created by Cornell University in cooperation with the State of New York.

Table D-1: Herbicide Use Table 1

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>2,4-D (Hardball, Shredder Amine 4, Surge)</p>	<p>2,4-D is a selective systemic herbicide used to control broadleaf weeds. The herbicidal properties, environmental chemistry, and toxicology of 2,4-D were investigated extensively. 2,4-D is labeled for grass pastures, roadsides, utility rights of way, guardrails, industrial sites, ornamental and recreational turfgrasses, parks and cemeteries, forest management, aerial and aquatic use.</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50</p> <p>Hardball Use Rate Values 3.4 – 11.9</p> <p>Shredder Amine Use Rate Values 4.1-32.9</p>	<p>This product is used on rights-of-way, infrastructure maintenance and safety of roadways. It is also used in open space natural areas with spot application and some limited, targeted broadcast applications for thistles, knapweed, curly dock, oxeye daisy, and various other broadleaf noxious weeds.</p>
<p>Aminopyralid (Milestone)</p>	<p>Aminopyralid is a pyridine carboxylic acid herbicide that provides systemic post-emergence broad-spectrum control of a number of noxious and invasive annual, biennial, and perennial weeds, as well as agronomic broadleaf weeds (USEPA, 2005). Aminopyralid is an auxin growth hormone mimic, affecting cell wall plasticity and nucleic acid metabolism. It has been classified as a low risk herbicide, meaning that USEPA has concluded that the use of aminopyralid as a replacement for other herbicides will decrease the risk to some non-target species (Syracuse Environmental Research Associates, 2007). Its manufacturer, Dow AgroSciences, indicates that aminopyralid is intended as an alternative to picloram, 2,4-D, dicamba, monosodium methanearsonate (MSMA), and metsulfuron methyl (Jachetta et al., 2004; Syracuse Environmental Research Associates, 2007).</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 1.8 -4.2</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas. It used in spot applications, and targeted broadcast treatments. It works extremely well on hoary cress and other mustards, thistles, curly dock, teasel, Russian knapweed, and other species. In instances of Canada thistle and teasel, if showy or marsh milkweed is present, it may be released on the site.</p>

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>Chlorsulfuron (Telar XP, Cimarron Plus, Chlorsulfuron 75)</p>	<p>Chlorsulfuron is used for pre-emergent and post-emergent control of many grasses and broadleaf weeds in agricultural, rangelands, pastures, and along rights-of-way. (SERA, 2016)</p>	<p>EIQ-FUR Value Very Low <25 Use Rate Values 0.2 – 3.8</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas. It is used in spot applications, and targeted broadcast treatments. It works extremely well on hoary cress and other mustards, thistles, curly dock, teasel, Russian knapweed, and other species. In instances of Canada thistle and teasel, if showy or marsh milkweed is present, it may be released on the site.</p>
<p>Dicamba (Dicamba, Clash, Surge, Vanquish, Weedmaster)</p>	<p>Dicamba is a systemic herbicide in the benzoic acid chemical class similar in structure and mode of action to phenoxy herbicides. Dicamba was first registered in the United States in 1967 and is widely used in agricultural, industrial, and residential settings. Dicamba controls annual, biennial and perennial broadleaf weeds in crops and grasslands, and it is used to control brush and bracken in pastures (USEPA, 2016).</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50 Use Rate Values 1.4 – 30.7</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas and is important in restoration projects. It is used in targeted spot applications and some broadcast applications. It has excellent efficacy on Russian thistle and curly dock. Works well on some other broadleaf species.</p>
<p>Fluroxypyr (Vista, Flagstaff)</p>	<p>Fluroxypyr is a selective post-emergent systemic herbicide. It is registered for the control of broadleaf weeds in rangeland, non-crop areas, and grazed areas and for the control of woody brush. Fluroxypyr is structurally similar to several other herbicides—i.e., aminopyralid, clopyralid, picloram, and triclopyr—and, like these other herbicides, fluroxypyr acts by mimicking indoleacetic acid, a plant growth hormone (SERA, 2009)</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50 Use Rate Values 4.4 – 25.1</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and road way safety, open spaces and natural areas and restoration projects. It is used in spot or targeted broadcast applications. It works well in restoration sites for control of kochia and other broadleaf annual species as seedling grass plants are trying to establish.</p>
<p>Glyphosate (Glyphosate Pro, Ranger, Rodeo)</p>	<p>Glyphosate [N-(phosphonomethyl)glycine] is a nonselective, post-emergent, and systemic herbicide registered for use in agricultural and nonagricultural areas. It is applied to a variety of food crops and agricultural drainage, sewage, and irrigation systems. There are several formulations of glyphosate, including an acid, monoammonium salt, diammonium salt, isopropylamine salt, potassium salt, sodium salt, and trimethylsulfonium or trimesium salt. It is highly effective for the control of weeds and invasive species. Glyphosate is a plant growth regulator that functions by targeting the plant specific shikimic acid pathway, inhibiting the synthesis of the enzyme 5-enolpyruvylshikimic acid-3-phosphate synthase, leading to reductions in aromatic amino acids necessary for plant protein synthesis and growth (Miller et al., 2010). Glyphosate is not effective on submerged or mostly submerged foliage and therefore is only applied to control emergent foliage (Schuette, 1998; Siemering, 2005).</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50 Use Rate Values 11.6 – 46.6</p>	<p>This herbicide is used Rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas and restoration projects. Its primarily used as a tool for rights-of-way, infrastructure maintenance and safety. Aquatic forms are used for cattail removal, Aquatic List A species, and aquatic restoration riparian sites. Glyphosate is used in restoration preparation and invasive tree – Cut stump treatments. Glyphosate is used to selectively control emerged weeds when natives and other desired species are dormant.</p>

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>Imazamox (Clearcast)</p>	<p>Imazamox is the active ingredient in Clearcast. It is a systemic, selective herbicide used for the control of floating, emergent, and submersed aquatic weed species. Imazamox is the industry standard for cattail control, which is needed for restoration projects for ecology and wildlife department and rights of way maintenance. Imazamox can be applied as a foliar, surface, or injection spray and as well as a pre-emergent in ponds and lakes. It is absorbed through the leaves, stems, and roots of vegetation and binds with an enzyme found only in plants not found in humans, mammals, birds, fish or insects. Imazamox stops the growth of sensitive plants within 24 hours after treatment and fully breaks down plants as food and energy reserves are exhausted.</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 4.5 – 19.7</p>	<p>This herbicide is used in targeted spot applications for cattail removal and Aquatic List A Species and water infrastructure maintenance.</p>
<p>Imazapyr (Ecomazapyr 2 SL, Arsenal, Habitat)</p>	<p>Imazapyr is a systemic, nonselective, pre- and post-emergent herbicide used for the control of a broad range of terrestrial and aquatic weeds. It controls plant growth by preventing the synthesis of branched-chain amino acids. Imazapyr is applied either as an acid or as the isopropylamine salt and is approved for use on grasses, commercial and residential sites, and water bodies.</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50</p> <p>Use Rate Values 6.5 – 38.8</p>	<p>This herbicide is used in targeted spot applications for cattail removal, Aquatic List A Species, and water infrastructure maintenance.</p>
<p>Indaziflam (Rejuvra, Esplanade 200SC)</p>	<p>Indaziflam is a pre-emergent herbicide providing broad spectrum control of many weed seedlings through the inhibition of seedling emergence and root development by the inhibition of cellulose biosynthesis in the roots of affected plants. For most effective control, Indaziflam should be applied prior to weed germination. Indaziflam has low post-emergent activity, but can be mixed with a herbicide with post-emergent activity (U.S. EPA/OPP 2010c). Indaziflam is used pre-emergent for the control of undesirable vegetation with the re-establishment of desirable perennial grasses, forbs, shrubs, and trees (USDA Forest Service and Bureau of Land Management, 2020).</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 0.7 -1.3</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas and is an ecological restoration tool. It is used in some targeted spot applications, tractor broadcast applications and aerial applications. It has excellent efficacy on cheatgrass and other winter annual invasive grasses as well as annual and biennial noxious weed control thistle, diffuse knapweed, mullein and other broadleaf weeds.</p>
<p>Quinclorac (Quinstar)</p>	<p>Quinclorac is a pre- and post-emergent systemic herbicide used to control broadleaf and grass weeds via ground spray or aerial application. Registered uses of quinclorac include turf grasses, rangeland/pasture, rights-of-way, fallow land, grass forage/ fodder/hay (USEPA, 2013)</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 6.7 – 20.1</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas. In targeted spot applications and in tractor broadcast applications. It provides control of field bindweed and leafy spurge. It is highly selective for controlling field bindweed with very little injury to native forb, shrub, and grass species.</p>

Table D-2: Herbicide Use Table 2

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>Aminocyclopyrachlor (Method)</p>	<p>Aminocyclopyrachlor is a pyrimidine carboxylic acid. The pesticidal mode of action is dysregulation of gene products involved in auxin receptor activity, which interferes with normal shoot and root development to stop the growth of weeds. Aminocyclopyrachlor is registered for uses of general weed and brush control on un-cultivated non-agricultural areas such as airports, highways, railroads, golf courses, lumber yards, wildlife habitats, recreation areas, utility rights of way (USEPA, 2010)</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values - NA-</p>	<p>This herbicide is used in open spaces and natural areas. It is applied with targeted spot applications, and limited tractor broadcast applications. It provides control of leafy spurge, thistles, field bindweed, knapweeds, toadflax, and many other broadleaf noxious weed species. This product is not tree safe.</p>
<p>Clopyralid (Transline)</p>	<p>Clopyralid is a selective herbicide used for broadleaf noxious weed control. It is structurally like aminopyralid, which has an extra amino group, and it is also an nutrient transport throughout the plant. It is highly selective for terrestrial plants and appears to be relatively non-toxic to aquatic plants (Syracuse auxin hormone mimic, causing abnormal growth that impairs proper Environmental Research Associates, 2004).</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 1.4 – 10.1</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas and restoration projects. It is used in targeted spot applications It provides an alternative herbicide for treatments of Canada thistle and other thistles in agricultural settings. Fall or early spring treatment of diffuse, spotted, and Russian knapweed in rosette to early bolt growth stages.</p>
<p>Diflufenzopyr (Overdrive)</p>	<p>Diflufenzopyr-sodium is a postemergence herbicide registered for use on pasture and rangeland grass, and non-crop areas. Diflufenzopyr is a semicarbazone herbicide used for selective broadleaf weed control. Diflufenzopyr is an auxin transport inhibitor, disrupting the delicate auxin balance needed for plant growth.</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 0.9 – 1.9</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural. It is applied through targeted spot applications. Its primary application is leafy Spurge.</p>
<p>Flumioxazin (Piper)</p>	<p>Flumioxazin is a light-dependent, peroxidizing N-phenylphthalimide herbicide used for the pre- and post-emergence control of terrestrial and aquatic weeds. Labeled uses include managing undesirable aquatic vegetation in slow-moving or quiescent waters. Flumioxazin is active against both aquatic and terrestrial vegetation, including some grasses, broadleaf weeds, and sedges. The herbicidal mechanism of flumioxazin is inhibition of protoporphyrin oxidase (PPO), the enzyme responsible for converting protoporphyrinogen IX to protoporphyrin IX, a precursor of heme and chlorophyll in plants. Inhibition of PPO results in accumulation of phototoxic porphyrins in plant cells and decreases heme synthesis and chlorophyll biosynthesis (Kestrel Tellevate LLC, 2020)</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 2.0 – 5.0</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas. It is applied with targeted spot applications. It provides preemergent control of perennial species and kochia. It may be used in restoration projects. It is tree safe.</p>
<p>Imazapic (Plateau, Panoramic)</p>	<p>Imazapic is an herbicide that is used in the control of grasses, broadleaves, and vines. Imazapic may be applied by directed foliar, broadcast foliar, or aerial methods (SERA, 2004). Imazapic is labeled for use in pastures, rangeland and noncropland areas including noncropland areas that may be grazed or cut for hay, railroad, utility, and highway rights-of-way, non-agricultural fence rows, storage areas, non-irrigation ditch banks, prairie sites, industrial turf, recreational and non-residential turf and other similar areas.</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 1.3 – 3.9</p>	<p>This herbicide is used on rights-of-way, for infrastructure maintenance, and safety. Is applied in targeted spot applications, tractor broadcast applications and can be used in aerial applications. It is used in open spaces and natural areas primarily for control of pre-emergence and early stages of growth of cheatgrass and other winter annual invasive grasses.</p>

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>Metsulfuron methyl (Escort XP, MSM 60, Cimarron Plus)</p>	<p>Metsulfuron methyl is a selective pre-emergence and post-emergence sulfonyl urea herbicide used primarily to control many annual and perennial weeds and woody plants (SERA, 2009). Metsulfuron methyl is mostly used for rights-of-way management.</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 0.1 – 1.3</p>	<p>This herbicide is used in open spaces and natural areas. It is applied in targeted spot applications, and works extremely well on thistles, curly dock, teasel, hoary cress and other mustards, and can be effective on other broadleaf species. In instances of Canada thistle and teasel, if showy or marsh milkweed is present, it may be released on the site.</p>
<p>Pyroxasulfone (Piper)</p>	<p>Pyroxasulfone belongs to a class of selective herbicides identified as pyrazole herbicides. It is used to control a broad spectmm of broadleaf weeds and grasses. Pyroxasulfone is thought to act as an inhibitor of very long chain fatty acid (VLCF A) biosynthesis. Applications may be made using ground or aerial equipment. Pyroxasulfone is currently registered for foliar use on a variety of agricultural crops, fallow land and, non-crop areas</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 1.3- 3.3</p>	<p>This herbicide is used on rights-of-way, infrastructure maintenance, and safety, open spaces and natural areas. It is applied with Targeted spot applications. It provides preemergent control of annual species. It may be used in restoration projects once seedling grass is established. It is tree safe.</p>
<p>Sulfentrazone (Sulfentrazone 4SC, Portfolio 4F, Surge)</p>	<p>Sulfentrazone is a broad spectrum herbicide that inhibits the germination of propagules and seeds of broadleaf, grass, and sedge weeds. Sulfentrazone is a soil-applied, pre-emergent and postemergence herbicide which can be applied either preplant incorporated, preemergence or postemergence to the weeds. Sulfentrazone is a ProtoPorphyrinogen Oxidase (PPO) Inhibitor. This herbicide inhibits the protoporphyrinogen oxidase enzyme which is important in the production of chlorophyll which causes a peroxidation of lipids in the cell membrane leading to cell leakage. Sulfentrazone is absorbed primarily by the roots and leads to rapid foliar desiccation. (USEPA, 2015)</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 1.2- 3.6</p>	<p>This herbicide is used in open spaces and natural areas for control of kochia and other broadleaf annual species. It is applied in Targeted spot applications and some tractor broadcast applications. It works well in restoration sites for control or small kochia plants as seedling grass plants are trying to establish.</p>

Table D-3: Herbicide Use Table 3

Active Ingredient (Product names)	Description	Environmental Impact Value	Examples of Use
<p>Mecoprop (Surge)</p>	<p>Mecoprop-p (MCP-p) is a member of the chlorophenoxy class of herbicides. MCP-p is thought to increase cell-wall plasticity, biosynthesis of proteins, and the production of ethylene. The abnormal increase in these processes result in abnormal and excessive cell division and growth, damaging vascular tissue. The most susceptible tissues are those that are undergoing active cell division and growth. Use sites are ornamental laws, recreational turf and rights-of-way. (USEPA, 2007)</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 2.7-5.4</p>	<p>This herbicide is used in turf grass maintenance. It is used for management of weeds in turf around the Parks and Open Space main building, Goodhue House, and Ag Heritage Center</p>
<p>Picloram (Tordon 22K)</p>	<p>Picloram is a herbicide used in the control of a number of broadleaf weeds and undesirable brush. Picloram is a systemic herbicide that is registered for the post-emergent control of broadleaf weeds and woody plants. Picloram is a pyridine carboxylic acid, a class of herbicides including aminopyralid, clopyralid, fluroxypyr, and triclopyr. The mechanism of action of picloram is like that of other auxin mimicking herbicides and involves mimicking the auxin plant growth hormone, indoleacetic acid. (SERA, 2011).</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 2.4 -18.3</p>	<p>This herbicide is sometimes used on rights-of-ways, open spaces and natural areas in spot applications and some targeted broadcast applications. It is effective for leafy spurge, thistles, field bindweed, toadflax, and knapweeds.</p>
<p>Rimsulfuron (Matrix SG)</p>	<p>Rimsulfuron is a selective/systemic pyrimidinyl sulfonyleurea herbicide and a member of the sulfonyleurea class of compounds. It has a mode of action that inhibits acetolactate synthase ALS (ALS is also known as acetohydroxyacid synthase AHAS) (HRAC Group B). ALS or AHAS is a key enzyme in the biosynthesis of certain amino acids in plants. The mode of action appears to require relatively low concentrations of the chemical. It is noted that repeated application might cause weeds to develop resistance to the sulfonyleurea family of herbicides that would require the application of an herbicide resistance program. Rimsulfuron is applied pre-emergent or post-emergent for weed control in various non-crop uses via ground and aerial applications. Rimsulfuron herbicide is used for control of many broadleaf and grass weed species primarily pre- and early post-emergent. USEPA, 2012</p>	<p>EIQ-FUR Value Very Low <25</p> <p>Use Rate Values 0.1 – 1.0</p>	<p>This herbicide is applied in tractor broadcast methods and used in restoration projects, for control of winter annual invasive grasses. It may be used in tank mix with Rejuvra (indaziflam).</p>
<p>Triclopyr (Garlon, Triclopyr 3)</p>	<p>Triclopyr is pyridine analogue of 2,4,5-T and differs from 2,4,5-T only by the presence of a nitrogen (N) atom in the ring structure. Like 2,4,5-T, triclopyr mimics auxin, a plant growth hormone, thus disrupting the normal growth and viability of plants. (SERA, 2011)</p>	<p>EIQ-FUR Value Very Low <25 Low 25-50 Moderate 50-100</p> <p>Use Rate Values 10.2 – 61.1</p>	<p>This herbicide is used on rights-of-way, for infrastructure maintenance, and safety of roadside brush control. Not often used.</p>

APPENDIX E: Herbicide List with Relative Toxicity Levels

Boulder County selects herbicides based on efficacy and toxicity levels. The following tables demonstrate that the herbicides are low toxicity to humans and ecological health based on risk assessment studies.

Table E-1 provides a “quick look” at the potential effects and toxicity of herbicide active ingredients for products used by Boulder County, including toxicity to humans, wildlife, and their relative toxicity to bees and insects. This tables demonstrate that the range of toxicity ratings is low to very low for human and ecological health impacts. Tables E-2, 3, and 4 provide additional details about the toxicity information in Table E-1. See references for these tables at the end of this Appendix.

Table E-1: Toxicity Ratings by Product and Active Ingredient

Products with a single active ingredient

A	B	C	D	E	F	G	H	I	G
Product With E.P.A. Registration #	Single Active ingredient	“Signal Word (Caution for Handlers)”	Low Rate EIQ-FUR Value	Low Rate EIQ-FUR Rating	High Rate EIQ-FUR Value	High Rate EIQ-FUR Impact	Herbicide LD50 Rating and Category Number		UNC Dept. of Ag Toxicity to Bees
							Oral LD50	Dermal LD50	
Shredder Amine 4 1381-103	2,4-dichlorophenoxyacetic	Danger	4.1	< 25 very low	32.9	< 50 low	Low (III)	Low (III)	Relatively nontoxic
Hardball 5905-549	2,4-dichlorophenoxyacetic	Danger	3.4	< 25 very low	11.9	< 25 very low	SAB	SAB	Relatively nontoxic
Method 432-1565	aminocyclopyrachlor	Caution		N/A		N/A	Very Low (IV)	Low (III)	Relatively nontoxic
Milestone 62719-519	aminopyralid	Caution	1.8	< 25 very low	4.2	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Telar XP 432-1561	chlorsulfuron	Caution	0.2	< 25 very low	3.8	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Transline 62719-259	clopyralid	Caution	1.4	< 25 very low	10.1	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Dicamba 19713-624	dicamba	Caution	6.6	< 25 very low	26.3	< 50 low	Low (III)	Low (III)	Moderately toxic
Vanquish 228-397	dicamba	Warning	7.7	< 25 very low	30.7	< 50 low	Low (III)	Low (III)	Moderately toxic
Overdrive 7969-150	diflufenzopyr	Caution	0.9	< 25 very low	1.9	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Vista XRT 62719-586	fluroxypyr	Warning	4.4	< 25 very low	25.1	< 50 low	Low (III)	Low (III)	Relatively nontoxic
Rodeo 62719-324	glyphosate	Caution	11.6	< 25 very low	46.6	< 50 low	Very Low (IV)	Low (III)	Relatively nontoxic
Clearcast 241-437-67690	imazamox	Caution	4.9	< 25 very low	19.7	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Panoramic 2 SL 66222-141-81927	imazapic	Caution	1.3	< 25 very low	3.9	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Plateau 241-365	imazapic	Caution	1.3	< 25 very low	3.9	< 25 very low	SAB	SAB	Relatively nontoxic
Ecomazapyr 2 SL 81927-22	imazapyr	Caution	6.5	< 25 very low	38.8	< 50 low	> 5000 (IV)	Low (III)	Relatively nontoxic
Rejuvra 432-1609	indaziflam	Caution	0.7	< 25 very low	1.3	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Escort XP 432-1549	metsulfuron methyl	Caution	0.1	< 25 very low	1.3	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
MSM 60 84229-8	metsulfuron methyl	Caution	0.1	< 25 very low	1.3	< 25 very low	SAB	Low (III)	Relatively nontoxic
Tordon 22K 62719-6	picloram(R)*	Caution	2.4	< 25 very low	18.3	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Prodiamine 65 WG 53883-429	prodiamine	Caution	3.8	< 25 very low	17.5	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Quinstar 4L 42750-88	quinclorac	Caution	6.7	< 25 very low	20.1	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Matrix SG 352-768	rimsulfuron	Caution	0.1	< 25 very low	1	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Portfolio 4F 279-3295-2935	sulfentrazone	Caution	1.2	< 25 very low	3.6	< 25 very low	Low (III)	Low (III)	Relatively nontoxic
Sulfentrazone 4SC 81927-86	sulfentrazone	Caution	1.2	< 25 very low	3.6	< 25 very low	SAB	SAB	Relatively nontoxic
Frequency 7969-281	topramezone	Caution	2.1	< 25 very low	8.4	< 25 very low	Low (III)	Low (III)	N/A
Triclopyr 3 81927-13	triclopyr	Danger	10.2	< 25 very low	61.1	50 - 100 moderate	Low (III)	Low (III)	Relatively nontoxic

*(R) Denotes Restricted Use.

Products with multiple active ingredients

A	B	C	D	E	F	G	H	I	G
Product With E.P.A. Registration #	Single Active ingredient	“Signal Word (Caution for Handlers)”	Low Rate EIQ-FUR Value	Low Rate EIQ-FUR Rating	High Rate EIQ-FUR Value	High Rate EIQ-FUR Impact	Herbicide LD50 Rating and Category Number		N.Car. Dept. of Ag Toxicity to Bees
							Oral LD50	Dermal LD50	
Piper 59639-237	flumioxazin	Caution	2	< 25 very low	5	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
	pyoxasulfone	Caution	1.3	< 25 very low	3.3	< 25 very low	Low (III)	Low (III)	N/A

A	B	C	D	E	F	G	H	I	G
Surge 2217-867	2,4-dichlorophenoxyacetic	Danger	8.2	< 25 very low	16.3	< 25 very low	Low (III)	Low (III)	Relatively nontoxic
	mecoprop	Caution	2.7	< 25 very low	5.4	< 25 very low	Low (III)	Low (III)	N/A
	dicamba	Caution	2	< 25 very low	4	< 25 very low	Low (III)	Low (III)	Moderately toxic
	sulfentrazone	Caution	0.2	< 25 very low	0.4	< 25 very low	Low (III)	Low (III)	Relatively nontoxic
Espande EZ 432-1528	indaziflam	Caution	0.7	< 25 very low	1.3	< 25 very low	Low (III)	Low (III)	Relatively nontoxic
	diquat dibromide	Caution							Relatively nontoxic
	glyphosate	Caution	11.6	< 25 very low	46.6	< 50 low	Very Low (IV)	Low (III)	Relatively nontoxic
Plainview SC 432-1606	indaziflam	Caution	0.6	< 25 very low	1.3	< 25 very low	Low (III)	Low (III)	Relatively nontoxic
	aminocyclopyrachlor		N/A		N/A		Very Low (IV)	Low (III)	N/A
	imazapyr	Caution	9.5	< 25 very low	19	< 25 very low	Very Low (IV)	Low (III)	Relatively nontoxic
Cimarron Plus 432-1572	metsulfuron methyl	Caution	0.1	< 25 very low	1	< 25 very low	Very Low (IV)	> 2000 (III)	Relatively nontoxic
	chlorsulfuron	Caution	0	< 25 very low	0.5	< 25 very low	Very Low (IV)	> 2000 (III)	Relatively nontoxic

Understanding Table E-1.

A definition for each column is provided below.

Column A. Product - the various products that are used in county weed management applications. There may be more than one product with same active ingredient, depending on availability or pricing of individual products.

Column B. Active Ingredient - Chemical found in product being applied.

Column C. Signal Word - Signal words help alert herbicide handlers to any special hazards or relative toxicity of an herbicide product. The only pesticide products that are not required to display a signal word are those that fall into the lowest toxicity category by all routes of exposure (oral, dermal, inhalation) and for other effects like eye and skin irritation. Signal words are informed by the LD50 Toxicity Ratings found in Table 2.

- **CAUTION** means the pesticide product is slightly toxic if eaten, absorbed through the skin, inhaled, or it causes slight eye or skin irritation.
- **WARNING** indicates the pesticide product is moderately toxic if eaten, absorbed through the skin, inhaled, or it causes moderate eye or skin irritation.
- **DANGER** means that the pesticide product is highly toxic by at least one route of exposure. It may be corrosive, causing irreversible damage to the skin or eyes. Alternatively, it may be highly toxic if eaten, absorbed through the skin, or inhaled. If this is the case, then the word "POISON" must also be included in red letters on the front panel of the product label.

Columns D-G. The Environmental Impact Quotient Field Use Rating (EIQ-FUR)

The EIQ-FUR is a formula created by Cornell University in cooperation with the State of New York to provide growers with data regarding the environmental and health impacts of pesticide options so they can make better-informed decisions regarding pesticide selection. Field Use Rating is the diluted rate in applications versus the concentrations found in container and is a key component of the calculator.

How The EIQ – FUR Calculator Works

When herbicide information [active ingredient (a.i.) + percentage of a.i. in container + formulation (i.e., liquid, granular, etc.) + field rate used (i.e., oz/ac)] is entered into the calculator, the EIQ-FUR calculator provides a value based on worker, consumer, and ecological toxicity exposure data from that herbicide. This value is then applied to the table below to provide environmental impact level the herbicide is expected to have.

Very Low Environmental Impact	< 25
Low Environmental Impact	25-50
Moderate Environmental Impact	50-100
High Environmental Impact	100-150

Column Data for the EIQ - Field Use Rating (EIQ-FUR) – Column D and Column F represents the EIQ-FUR value at the lowest and the highest rate the department applies that specific herbicide. Column E and G represents the associated expected level of environmental impact at those levels.

Columns H-I. LD50 Ratings - A common measurement of acute toxicity, it's the lethal dose (resulting from a single or limited exposure) in 50 percent of the treated test animals. LD50 is generally expressed as the dose in milligrams (mg) of chemical per kilogram (kg) of body weight. The lower the total number of mg of active ingredient (a.i.) the more toxic the compound is. The categories are from High Toxicity to Very Low Toxicity. Column H represents the LD50 oral dose toxicity level/category and column I represents the dermal toxicity level/category for each herbicide in the table. For more information see Table E-2 and E-3 below.

Column J. Environmental Protection Agency Categories of Toxicity

Tables E-2 and E-3 below provide information for handlers and applicators about toxicity and resulting required safety equipment and are reflected in columns H through I in Table E-1 above, and are informed by LD50 measurements.

Table E-2: Categories of Pesticide Toxicity

Worker Safety: Minimum PPE and Work Clothing for Pesticide-Handling Activities

	High Toxicity	Moderat Toxicity	Low Toxicity	Very Low Toxicity
Route of Exposure	Toxicity Cat. I	Toxicity Cat. II	Toxicity Cat. III	Toxicity Cat. IV
Dermal toxicity or skin irritation potential	Coveralls worn over long-sleeved shirt and long pants	Coveralls worn over short-sleeved shirt and short pants	Long-sleeved shirt and long pants	Long-sleeved shirt and long pants
		Socks		
	Socks	Chemical-resistant footwear	Socks	Socks
	Chemical-resistant footwear	Chemical-resistant gloves	Chemical-resistant footwear	Chemical-resistant footwear
	Chemical-resistant gloves		no minimum	no minimum
Inhalation toxicity	Respiratory protection device	Respiratory protection device	no minimum	no minimum
Eye irritation potential	Protective eyewear	Protective eyewear	no minimum	no minimum

Table E-3: Minimum Personal Protective Equipment for Worker Safety

Toxicity Categories for Active Ingredients

	High Toxicity	Moderat Toxicity	Low Toxicity	Very Low Toxicity
Route of Exposure	Toxicity Cat. I	Toxicity Cat. II	Toxicity Cat. III	Toxicity Cat. IV
Oral LD50	Up to & including 50 mg/kg	50-500 mg/kg	500-5,000 mg/kg	>5,000 mg/kg
Inhalation LC50	Up to and including 0.2 mg/l	0.2-2 mg/l	2-20 mg/l	>20 mg/l
Dermal LD50	Up to and including 200 mg/kg	200-2,000 mg/kg	2,000-20,000 mg/kg	>20,000 mg/kg
Eye Effects	Corrosive corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours
Signal Word	DANGER POISON	WARNING	CAUTION	CAUTION

For comparison and context for the LD50 chart, Table E-3 shows some LD50 ratings for common household products that are used on a daily basis within the limits of label or directions for use.

Table E-4: Comparison of Toxicity Levels for Commonly Used Substances

Relative Toxicity Chart	
Chemical Substance	LD50 Rating
Vitamin D3	37 mg/kg of wt.
Caffeine	192 mg/kg of wt.
Asprin	200 mg/kg of wt.
Advil, Ibuprofen	636 mg/kg of wt.
Table Salt	3000 mg/kg of wt.

References:

Information for these charts has been derived from university supported studies, in some cases in cooperations with state agencies, and Environmental Protection Agency (EPA) approved herbicide labels, and other research.

Table E-1

The Environmental Impact Quotient (EIQ). Kovach, J., Petzoldt, C., Degni, J., and Tette, J. 1992. A method to measure the environmental impact of pesticides. New York’s Food and Life Sciences Bulletin 139:1–8; Grant, J. A. <https://cals.cornell.edu/new-york-state-integrated-pest-management/risk-assessment/eiq/eiq-calculator> Calculator for Field Use EIQ (Environmental Impact Quotient). New York State Integrated Pest Management Program, Cornell Cooperative Extension, Cornell University. 2010-2020

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

Toxicity rating from Pesticide Toxicity to Bees “Traffic Light”; Highly Toxic to Bees (LD50<2µg a.i./bee); Moderately Toxic to Bees (LD50 2-11 µg a.i./bee); Relatively Non-toxic to Bees (LD50>11µg a.i./bee) 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. a = derived from Pacific Northwest Extension Publication 591 b = RT 25varies with formulation and application rate;

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

Tables E-2 and E-3

Environmental Protection Agency, Label Review Manual Chapter 7: Precautionary Statements, Revised March 2018

Link: <https://www.epa.gov/sites/default/files/2018-04/documents/chap-07-mar-2018.pdf>

TABLE E-4

AAT Bioquest Inc.

Quest Database™ Vitamin D3 Toxicity (LD50).” AAT Bioquest, Inc., 22 Sep. 2023, <https://www.aatbio.com/resources/toxicity-lethality-median-dose-td50-ld50/vitamin-d3>.

AAT Bioquest, Inc. (2023, September 22). Quest Database™ Vitamin D3 Toxicity (LD50). AAT Bioquest. <https://www.aatbio.com/resources/toxicity-lethality-median-dose-td50-ld50/vitamin-d3>

APPENDIX F: Aerial Application Policy

Overview

Boulder County recognizes a need for limited aerial applications on Boulder County Parks & Open Space 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 herbicide product labels. Only herbicide labels with an aerial application citation are used for aerial treatments.

Aerial Application Site Selection

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

- Aerial Treatment areas will be areas identified as mostly inaccessible by ground rig operations or areas where it would be dangerous for ground rig operations crews. Examples: no access roads, steep grade, and rocky terrain.
- Only sites located greater than 1/8 of a mile minimum distance from primary urban areas will be considered for helicopter applications.
- Drone technology will be considered for aerial applications in areas identified as, mostly inaccessible by ground rig operations but in those areas less than 1/8th mile distant from primary urban or residential areas.
- Drones may also be used in spot application treatments.

Methods of Aerial Application

Two methods of aerial application may be utilized, helicopter and/or drone. Fixed wing aircraft are not appropriate for aerial applications on Boulder County Parks & Open Space properties.

Helicopter Application– Determination for use

- Only used greater than 1/8th of a mile of from urban or residential areas
- Spray 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.

Helicopter: Notification of Application

Notifications for helicopter applications:

- Written notifications will be made to residences within 1/8th 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.

Drone Application – Determination for Use

Drone herbicide application technology allows for:

- Areas within 1/8th mile of residential or urban areas.
- Flying close to the ground, 15 feet or lower.
- Treating inaccessible, or marginally accessible areas where there would be a risk to equipment or workers.
- 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.

Drone: Notification of Application

Notifications for drone applications: Notification will be posted on the daily herbicide application website similar to targeted spot and broadcast applications, given the low elevation of flight.

Drift Mitigation Measures for Helicopters and Drones:

Drift mitigation measures may include:

- Use of 100 foot buffer areas next to environmentally sensitive areas such waterways and critical habitats
- On site weather monitoring
- No treatment during inversions
- No treatment when winds exceed herbicide label requirements
- No treatment when weather forecasts predict rain in next 24 hours



Photo demonstrates treatment line

Aerial Buffers

Application buffers are often specified on product labels. Boulder County's proposed buffers are more conservative than product label requirements:

- Helicopters:
 - o 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.
 - o 50 feet from environmentally sensitive areas.
- Drones:
 - o 25 feet from the Parks & Open Space property boundaries.
 - o 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 feet with written agreement of adjacent landowner.