THOMPSON THRIFT EL PASO COUNTY NOXIOUS WEED MANAGEMENT PLAN

Prepared for:

Thompson Thrift

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ACRONYMS

°F	Fahrenheit
Act	Colorado Noxious Weed Act
bls	below land surface
BMP	best management practice
C.R.S.	Colorado Revised Statutes
CDA	Colorado Department of Agriculture
CPW	Colorado Parks and Wildlife
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
Plan	Noxious Weed Management Plan
Project	Thompson Thrift Project
USDA	United States Department of Agriculture

1. INTRODUCTION

Thompson Thrift (Client) retained Olsson, Inc. (Olsson) to prepare this Noxious Weed Management Plan (Plan) for the Thompson Thrift Multifamily Development Project (Project) in El Paso County, Colorado. The Project entails the construction of a multifamily residential development consisting of 336 residential units, clubhouse, gym, pool, leasing center and associated parking and utilities.

1.1. Location and Description

Figures 1 and **2** (**Appendix A)** present topographic and aerial overviews of the Project area, respectively. The approximately 17-acre Project area is located in El Paso County, Colorado in Section 4, Township 15 South, Range 66 West, in the Colorado Springs, Colorado Quadrangle (Figure 1, Appendix A). The geometric center of the Project area is located at latitude 38.770359 degrees and longitude -104.786314 degrees.

The Location Map (**Figure 1, Appendix A**) indicates the relief is relatively uneven with elevations ranging from 5,920 feet above mean sea level in the southeastern portion of the Project area to 5,840 feet above mean sea level along the west-northwestern boundary of the Project area. The United Stated Geological Survey (USGS) topographic layer does not depict any water features within the Project area.

The Aerial Site Map (**Figure 2, Appendix A**) shows the Project area encompassing a broad grassed field which continues north, beyond the Project boundary. The western portion is bounded by an unpaved two-track road adjacent to a stream channel. A medium densely populated residential area is located immediately west of the channel. Venetucci Boulevard bounds the eastern boundary of the Project area. The area beyond Venetucci Boulevard is occupied by a number of commercial and retail developments which continue to the southern extent of the site.

1.2. Noxious Weed Management Plan Objectives and Goals

The primary purpose of this Plan is to provide guidelines to help prevent the introduction and establishment of noxious weeds within the Project area in disturbed areas cleared in preparation for Project construction. The key objectives of this Plan are to:

- Help prevent the introduction and spread of noxious and invasive weeds within the Project area;
- Meet the objectives of the Colorado Noxious Weed Act, as well as Section 2, Subsection 2.01 of the El Paso County Noxious Weed Management Plan;

- Identify an integrated weed management approach for managing construction activities within the Project area;
- Develop controls specific to noxious weeds list available through El Paso County or the Colorado Department of Agriculture; and
- Develop potential response actions to noxious weed infestations.

The goals of this Plan include:

- **Eradication:** Reducing the reproductive success of a noxious weed species or specified noxious weed population.
- **Containment:** Maintaining a managed buffer zone that separates infested areas, where suppression activities prevail, from largely un-infested areas, where eradication activities prevail.
- **Suppression:** Reducing the vigor of noxious weed populations within an infested area, decreasing the prosperity of noxious weeds to spread to surrounding land, and mitigating the negative effects of noxious weed populations on infested land.
- **Restoration:** The removal of noxious weed species and re-establishment of desirable plant communities in order to help restore or maintain value.

Olsson biologists visited the Project site on October 16, 2024. Field bindweed (*Convolvulus arvensis*) and Canada thistle (*Cirsium arvense*) were observed within the Project area (**Figure 3, Appendix A**). Canada thistle is a Colorado List B and El Paso County List B noxious weed species. Field bindweed is a Colorado List C noxious weed species but is not on the El Paso County noxious weed list. List B noxious weeds are species whose continued spread should be stopped. List C noxious weeds are species selected for recommended control methods.

1.3. Soil Types

According to the Natural Resources Conservation Service (NRCS) Soil Survey of El Paso County, Colorado, there is one soil type within the Project area (**Table 1.1**).

Table 1.1 Soil Types and Properties

Soil Type	Drainage Class	Runoff Class	Hydric Soil Rating
Schamber-Razor complex, 8 to 50 percent slopes	Well Drained	Medium	1%

Source: NRCS Web Soil Survey 2024.

2. REGULATORY REQUIREMENTS FOR NOXIOUS WEED MANAGEMENT

The Colorado Noxious Weed Act (Act), Colorado Revised Statutes (C.R.S.) Section 35-5,5-101, et seq. states that certain noxious weeds pose a threat to the continued economic and environmental value of the land in the state and that they must be managed by all landowners in the state. The Act states that local governments, cities, and counties are directed to take the necessary steps to manage the noxious weeds in their respective jurisdictions. As a result, the El Paso County Board of Commissioners established a local Noxious Weed Advisory Commission whose primary function is the development of an integrated management plan for noxious weeds within the area governed by the County.

2.1. Noxious Weed Identification

Noxious weeds are plants considered harmful to the environment or animals, especially ones that may be the subject of regulations governing attempts to control them. For the purpose of this Plan, noxious weeds are those plants designated by El Paso County and Colorado Department of Agriculture.

Appendix B contains the El Paso County and the Colorado Department of Agriculture List A (Noxious Weeds for Eradication), List B (Noxious Weed Species), and List C (Suppression Weed Species).

2.2. Weed Identification and Management Resources

The following agencies (and websites) provide resources for identifying and managing noxious weeds:

- El Paso County Parks and Community Services Department Environmental Division (https://communityservices.elpasoco.com/environmental-division/);
- Colorado Weed Management Association (https://cwma.org);
- Colorado State University Cooperative Extension Service (https://extension.colostate.edu/topic-areas/agriculture/noxious-weeds-invasive-plant-species/); and
- Weed Science Society of America (http://wssa.net/).

These agencies and websites provide information on how to recognize noxious weeds and invasive weed species and how to control them.

3. GENERAL NOXIOUS WEED CONTROL MEASURES

The following sections present the non-species-specific control measures recommended to be implemented as part of this Plan.

3.1. Noxious Weed Prevention

The most efficient and cost-effective way to control noxious weed infestations is to prevent them from occurring. This will require Thompson Thrift to employ an integrated weed management approach toensure that construction equipment brought on-site be clean and free of vegetation, mud, soil, and weed seeds. When construction activities are planned during non-dormant times for weeds, controls will be put in place to prevent noxious weeds and invasive species from becoming established within the disturbed soil areas of the Project area.

Thompson Thrift will employ construction best management practices (BMPs) during construction and will adhere to the erosion and sediment control measures in its Area 1 Storm Water Management Plan (SWMP) to help prevent the erosion and unintentional transport of soil.

Topsoil removed from the Project construction areas will be preserved and maintained so that it does not lose the ability to support vegetation. Impacts to native vegetation will be limited to the maximum extent practical and disturbed areas will be reseeded with native seed mixes.

Disturbed soil areas will be reclaimed with permanent control measures such as hard scape (e.g., gravel) or planted with a seed mix as soon as practicable after the construction activities are completed or as recommended by the seed provider. The selected seed mix will consist of mostly native grasses and plant species, as identified in Section 1.6, and will be certified weed-seed free. Seeding will be performed at prescribed rates and methods. The best times of year to seed are in March (prior to or during heavy wet snow events), and in November after the rainstorms and hot temperatures have abated so the seed does not germinate prematurely and die before the grasses go to seed.

3.2. Weed Management and Control

Noxious weed management requires planning and implementation of an integrated and coordinated program utilizing a variety of methods for managing noxious weeds. Noxious weed management is specified for two periods: 1) the early plant establishment period; and 2) long-term vegetation maintenance to achieve desirable plant communities. Methods may include, but are not limited to, education, the preventative measures described in Section 3.1, good stewardship, and any of the following techniques:

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

- **Chemical Management:** The use of herbicides or plant growth regulators to disrupt the growth of noxious weeds.
- **Cultural Management:** 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 an optimum density and spatial arrangement in an area, and planting species that are most suited to that area.
- **Mechanical Management:** Methodologies or management practices that physically disrupt plant growth including tilling, mowing, burning, mulching, hand-pulling, hoeing, and grazing.

3.2.1 Biological Management

Biological control of weeds refers to the utilization of an agent, a complex of agents, or biological processes to bring about weed suppression. All forms of microbial and microbial organisms are considered as biological control agents. Examples of biological control agents include arthropods (insects and mites), plant pathogens (fungi, bacteria, viruses, and nematodes), fish, birds, and other animals. Maintaining a healthy rangeland such that native species out-compete invasive species is also a form of biological control. Classical biological control of non-native invasive weeds with natural enemies originating from the native range of the weed, has proven a viable strategy for managing weeds in areas subject to low-intensity management, such as rangelands.

The problem with noxious weeds that are invasive species is that they have been introduced into areas where there are no natural enemies or biological agents that can disrupt the weed propagation and growth cycle. Introduction of natural enemies or biological agents can have unintended consequences. Biological control is a viable option for dealing with some noxious weeds that have grown out of control. If the infestation is small or just getting started, biological control is not the best solution.

3.2.2 Chemical Management

Herbicides are chemicals used to kill weeds by interfering with the normal biological processes of plants, usually through an interaction with a crucial enzyme. Herbicides are a class of pesticides.

Herbicides should not be used adjacent to streams or water resources, or shortly before a rain event. Recommendations for specific herbicides are included in Section 4; however, those recommendations should be routinely reviewed and updated if regulations change or new/improved herbicides become available.

3.2.3 Cultural Management

Cultural weed management practices are actions that help native seed mixes be more competitive against weed species. Such techniques have been used effectively in decreasing weed issues in

row crops and to help optimize herbicide-based programs. Noxious weed management requires an integrated program, so cultural management may be used as a prevention tool or may be used in tandem with other weed control measures.

Examples of cultural management include maintaining optimal field nutrient availability, planting in weed-free soil, selecting seed varieties that compete well, using certified weed-free seed mixes, and maintaining adequate soil and plant moisture levels.

3.2.4 Mechanical Management

Mechanical weed management techniques such as tilling, mowing, burning, pulling, digging, cutting, mulching, and solar sterilization can be economical means of noxious weed control over large areas.

Mowing is an effective method for controlling many weed species. Mowing is usually conducted before the weeds produce seed, but it is not effective on plants that reproduce from spreading roots or rhizomes.

Pulling young plants or plants with shallow roots can be an effective control method; however, it is labor intensive and not cost effective for large communities. Pulled plants should be disposed of properly in sealed containers to avoid re-colonization in disposal areas.

Digging plants along with their roots can be an effective control method provided the weedy plant has not yet produced seeds that could be dispersed by bumping or handling the plant.

Cutting seed heads from plants that have not yet produced seed can be an effective control method but is labor intensive. Plant parts that have been removed must be properly disposed of to prevent re-colonization of disposal areas.

Areas that are cleared of vegetation for construction activities may benefit from periodic tilling to break up the soil and disrupt weeds from becoming established. If there will be a time lag before construction activities commence it may be better to wait until closer to the time of construction to clear vegetation from the area. Use of harrows, weeders, and cultivators soon after an area is cleared and repeated use can prevent weeds from becoming established in a cleared area.

Mulching requires spreading a layer of organic material, such as straw, wood chips, green waste, pine straw, leaves, grass clippings, etc. on the ground. Compared with some other methods of weed control, mulching is relatively simple and inexpensive. Mulching smothers the weeds by excluding light and providing a physical barrier to impede their emergence. Mulching is successful with most annual weeds; however, some perennial weeds are not affected. The effectiveness of mulching depends on the material used. Organic and synthetic mulches may be used in combination with each other to increase the number of weeds controlled.

Soil solarization is a simple and effective method of weed control in small areas. Soil solarization involves covering the soil with a layer of clear or black plastic. The plastic covering the ground traps heat energy from the sun and raises the temperature of the soil. Many weed seeds and vegetative propagules are not able to withstand the temperatures and are killed. For solar sterilization to be most effective, it should be implemented during the summer months and the soil should be moist. Cool season weeds are more responsive to soil solarization than warm season weeds.

3.3. Weed Control Timing

Weed control, especially of noxious invasive species, should be completed regularly with periodic visual inspections and timely response actions taken if weed infestations are detected. Weeds are most likely to grow rapidly following rain events, and during warmer summer months. When desired vegetation is healthy and dominates the ground cover, weed species establishment is difficult.

4. SITE SPECIFIC SPECIES CONTROL MEASURES

Proper site preparation and seed implementation, including the removal of undesirable species prior to planting seed mixes, is the best way to reduce future weed pressure. Management of noxious weeds must be completed regularly. Noxious weed species are most likely to grow rapidly following early spring and through the warmer summer months. Operations and maintenance staff implementing noxious weed species control methods should have sufficient familiarity with plant identification to determine the difference between cultivated species and undesirable species.

Invasive species control can be highly variable depending on the species in question, time of year, and severity of infestation. Recommended management techniques targeted to the two noxious weed species identified within the Project area during Olsson's October 16, 2024, site visit is described below. The below recommendations were developed based on information found in the Colorado Department of Agriculture (CDA) and Colorado State University (CSU) Fact Sheets for field bindweed (2007) and Canada thistle (2015) (**Appendix C**).

4.1. Field Bindweed

Field bindweed is a non-native, deep-rooted perennial that spreads through both seed dispersal and aggressive vegetative reproduction from its extensive root system. The leaves are typically arrowhead- or spade-shaped, with a bright green color, and the flowers are small, funnel-shaped, and white to pink. According to the United States Department of Agriculture (USDA) and NRCS, field bindweed is found in a wide variety of environments, including cultivated fields, orchards, pastures, lawns, gardens, roadsides, and along railways. This plant is one of the most problematic

weeds worldwide, notorious for reducing crop yields and increasing production costs due to its invasive nature.

Effective control of field bindweed requires an integrated combination of methods due to its persistence and aggressive reproduction. Prevention is key to managing its spread, as once established, bindweed is difficult to eradicate. Management becomes more challenging once seeds are produced, as field bindweed's seeds can remain viable in the soil for over 20 years. To prevent spread, established plants must be continually stressed. A combination of mechanical cultivation and herbicide application is considered the most effective method of control. Regular mowing or tilling, followed by the application of herbicides such as glyphosate or dicamba, is recommended to achieve long-term suppression.

Cultural

For cultural control of field bindweed, prevent bare ground through grazing or disturbance. Properties should be monitored for new infestations and treated with the mechanical and chemical methods described below to be most effective. Establishing native grasses also can be an effective control method.

Biological

Biological control options include the use of the gall mite (*Aceria malherbae*), which stunts the growth of field bindweed and reduces its seed production. This method can be used to complement other control strategies such as herbicide applications but should not be relied upon as a standalone solution.

Mechanical

Mowing field bindweed can be effective if done every 10 to 21 days throughout the growing season. Regular cultivation, particularly during the growing season when root carbohydrate reserves are low (around May), can significantly weaken the bindweed. Combining mowing with herbicides (preferred) will further enhance field bindweed control. Hand-pulling and tilling, which can stimulate the growth of new plants, should be avoided.

Chemical

Herbicide treatments such as glyphosate, 2,4-D, dicamba, quinclorac, and picloram are recommended for field bindweed management. Herbicide applications should be carefully timed, particularly during the active growth periods in the spring and fall, and multiple applications may be required over several years to achieve long-term control. Chemical treatments may be necessary for an additional one to three years following the initial treatment. USDA and NRCS recommended herbicides that can be applied to range and pasturelands are listed in **Table 4.1**. The applicator should always read, understand, and follow the label directions.

Table 4.1 Recommended Herbicides for Field Bindweed Management

Herbicide (Brands)	Rate	Application Timing
Glyphosate * (Roundup, others)	1-2 quarts/acre + 0.25% v/v non-ionic surfactant	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth.
2,4-D Amine or Ester	1-2 quarts/acre + 0.25% v/v non-ionic surfactant	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth.
Dicamba (Banvel, others)	0.5-1 pint/acre + 0.25% v/v non-ionic surfactant	Apply in spring at the pre-bud growth stage until flowering and/or to fall before frost.
Quinclorac	0.37-0.75 lbs/acre + 0.25% v/v non-ionic surfactant	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth.
Picloram (Tordon)	0.25-1 quart/acre + 0.25% v/v non-ionic surfactant	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth. Only use on non-cropland areas due to soil persistence.
*This product is non-selective and will kill any vegetation contacted.		

Source: NRCS, Montana Invasive Species Technical Note MT-9.

4.2. Canada Thistle

Canada thistle is a non-native, deep rooted perennial that spreads by seed dispersal and aggressive creeping. The leaves are oblong, spiny, bright green, and slightly airy on the undersurface. The flowers vary from white to purple and occur in small clusters at the end of each stem. According to CDA and CSU, Canada thistle are found in a variety of land types ranging from roadsides, ditches, riparian areas, meadows, and pastures, as well as both irrigated and dryland cropland.

Effective control of Canada thistle requires a combination of methods. Prevention is the most important strategy. Management options are limited once this plant produces seeds, and established plants need to be continually stressed to prevent them from seeding. Mowing or grazing followed by herbicide application is the preferred method of control.

Cultural

For cultural control of Canada thistle, prevent bare ground through grazing or disturbance. Properties should be monitored for new infestations and treated with the mechanical and chemical methods described below to be most effective. Establishing native grasses also can be an effective control method.

Mechanical

Mowing Canada thistle can be effective if done every 10 to 21 days throughout the growing season. Combining mowing with herbicides (preferred) will further enhance Canda thistle control. Hand-pulling and tilling, which can stimulate the growth of new plants, should be avoided.

Biological

Cattle, goats, and sheep will graze on Canada thistle when plants are young and succulent in the spring. CSU recommends following grazing with an herbicide application in the fall.

Chemical

Chemical treatments may be necessary for an additional one to three years following initial treatment. CSU recommended herbicides (**Table 4.2**) can be applied to rangeland and some pastures. The applicator should always read, understand, and follow the label directions.

Table 4.2 Recommended Herbicides for Canada Thistle Management

Herbicide (Brands)	Rate	Application Timing
Aminopyralid (Milestone)	5-7 ounces (oz) product/acre + 0.25% volume per volume (v/v) non-ionic surfactant OR 1 teaspoon product/gallon (gal) water + 0.32 oz/gal water	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth. Can also add chlorsulfuron (Telar) at 1 oz/acre to the mix.
Clopyralid + Triclopyr (Prescott; Redeem; others)	3 pints product/acre + 0.25% v/v non-ionic surfactant OR 1.25 oz product/gal water + 0.32 oz/gal water	Apply until flowering and/or fall regrowth.
Aminocyclopyrachlor + chlorsulfuron (Perspective)	5.5 oz product/acre + 0.25% v/v non-ionic surfactant	Apply to spring rosette to flower bud growth state or in the fall. IMPORTANT: Applications greater than 5.5 oz product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirables trees and shrubs. Not for use on grazed or feed forage.

Source: CDA and CSU Canada Thistle Identification and Management Fact Sheet 2015.

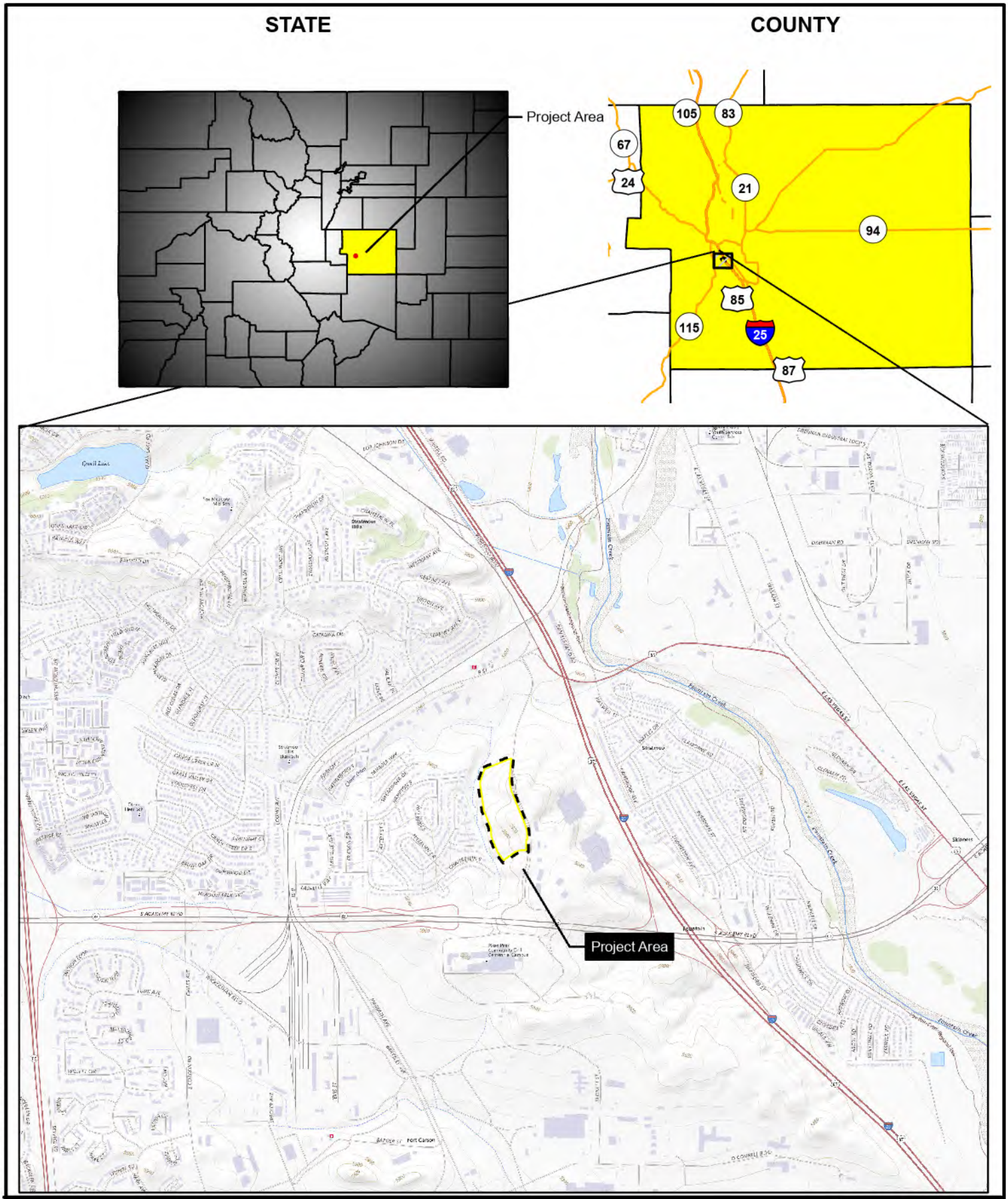
5. SUMMARY

This Plan presents Thompson Thrift's integrated approach to weed management within the Project area. First and foremost, Thompson Thrift will practice weed suppression to prevent noxious weeds from being introduced to disturbed areas and by requiring contractors' equipment to be free of dirt and vegetation prior to mobilization to the Project area. Thompson Thrift will employ construction BMPs during construction and will adhere to the erosion and sediment control measures in its SWMP to help prevent the erosion and unintentional transport of soil. Topsoil removed from Project construction areas will be preserved and maintained so that it does

not lose the ability to support vegetation. Impacts to native vegetation will be limited to the maximum extent practical and disturbed areas will be reseeded with native seed mixes.

Monitoring for weeds is the next step to make sure that noxious weeds do not gain a foothold in the disturbed areas of the Project area, along with implementation of adequate control measures. Beyond the species-specific methods described in Section 4, biological and mechanical control measures may be attempted for newly found noxious weed species not previously identified within the Project area before resorting to chemical controls, unless a weed is a List A noxious weed—List A species are designated for eradication in the state.

Appendix A
Project Maps


STATE
COUNTY
Project Area
105
83
67
24
21
94
85
115
25
87
Project Area
0
1,000
2,000
3,000
ft
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Project Area
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Thompson Thrift
Noxious Weed Management Plan
024-00437
El Paso County, Colorado
Location Map
Figure 1
NAD 1983 HARN StatePlane Colorado North FIPS 0501 Feet
Basemap: ESRI World Imagery
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Thompson Thrift

Noxious Weed Management Plan
024-00437
El Paso County, Colorado
Site Map
Figure 2

N 0 140 280 560 ft

1:6,000

Project Area

olsson

NAD 1983 2011 StatePlane Colorado North FIPS 0501 Ft US

Basemap: ESRI World Imagery

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Species

- Cirsium arvense
- Convolvulus arvensis

Species

- Convolvulus arvensis
- Convolvulus arvensis and Cirsium arvense

Project Area

N

0 50 100 200 ft

1 " = 216 '

olsson

Thompson Thrift
Noxious Weed Management Plan
024-00437
El Paso County, Colorado
Noxious Weed Map
Figure 3

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NAD 1983 2011 StatePlane Colorado North FIPS 0501 Ft US

Basemap: ESRI World Imagery

Appendix B
State of Colorado and El Paso County Noxious Weed Lists

Colorado Noxious Weeds (including Watch List), effective May, 2023

List A Species (26)

Common	***Scientific***
Camelthorn	*(Alhagi maurorum)*
Giant reed	*(Arundo donax)*
Elongated mustard	*(Brassica elongata)*
Flowering rush	*(Butomus umbellatus)*
Yellow starthistle	*(Centaurea solstitialis)*
Squarrose knapweed	*(Centaurea virgata)*
Meadow knapweed	*(Centaurea x moncktonii)*
Rush skeletonweed	*(Chondrilla juncea)*
Common crupina	*(Crupina vulgaris)*
Hairy willow-herb	*(Epilobium hirsutum)*
Cypress spurge	*(Euphorbia cyparissias)*
Myrtle spurge	*(Euphorbia myrsinites)*
Japanese knotweed	*(Fallopia japonica)*
Giant knotweed	*(Fallopia sachalinensis)*
Bohemian knotweed	*(Fallopia x bohemicum)*
Orange hawkweed	*(Hieracium aurantiacum)*
Hydrilla	*(Hydrilla verticillata)*
Yellow flag iris	*(Iris pseudacorus)*
Dyer's woad	*(Isatis tinctoria)*
Purple loosestrife	*(Lythrum salicaria)*
Parrotfeather	*(Myriophyllum aquaticum)*
African rue	*(Peganum harmala)*
Mediterranean sage	*(Salvia aethiopis)*
Giant salvinia	*(Salvinia molesta)*
Tansy ragwort	*(Senecio jacobaea)*
Medusahead	*(Taeniatherum caput-medusae)*

List B Species (38)

Common	***Scientific***
Jointed goatgrass	*(Aegilops cylindrica)*
Mayweed chamomile	*(Anthemis cotula)*
Absinth wormwood	*(Artemisia absinthium)*
Plumeless thistle	*(Carduus acanthoides)*
Musk thistle	*(Carduus nutans)*
Wild caraway	*(Carum carvi)*
Diffuse knapweed	*(Centaurea diffusa)*
Spotted knapweed	*(Centaurea stoebe ssp. micranthos)*
Spotted x diffuse knapweed hybrid	*(Centaurea x psammogena)*
Canada thistle	*(Cirsium arvense)*
Bull thistle	*(Cirsium vulgare)*
Chinese clematis	*(Clematis orientalis)*
Houndstongue	*(Cynoglossum officinale)*
Yellow nutsedge	*(Cyperus esculentus)*
Common teasel	*(Dipsacus fullonum)*
Cutleaf teasel	*(Dipsacus laciniatus)*
Russian-olive	*(Elaeagnus angustifolia)*
Leafy spurge	*(Euphorbia esula)*

List B Species Continued (38)

Common	***Scientific***
Dame's rocket	*(Hesperis matronalis)*
Black henbane	*(Hyoscyamus niger)*
Hoary cress	*(Lepidium draba)*
Perennial pepperweed	*(Lepidium latifolium)*
Oxeye daisy	*(Leucanthemum vulgare)*
Dalmatian toadflax, broad-leaved	*(Linaria dalmatica)*
Dalmatian toadflax, narrow-leaved	*(Linaria genistifolia)*
Yellow x Dalmatian toadflax hybrid	*(Linaria vulgaris x L. dalmatica)*
Yellow toadflax	*(Linaria vulgaris)*
Eurasian watermilfoil	*(Myriophyllum spicatum)*
Scotch thistle	*(O. tauricum)*
Scotch thistle	*(Onopordum acanthium)*
Sulfur cinquefoil	*(Potentilla recta)*
Russian knapweed	*(Rhaponticum repens)*
Bouncingbet	*(Saponaria officinalis)*
Salt cedar	*(T. chinensis)*
Salt cedar	*(Tamarix. ramosissima)*
Common tansy	*(Tanacetum vulgare)*
Scentless chamomile	*(Tripleurospermum inodorum)*
Moth mullein	*(Verbascum blattaria)*

List C Species (18)

Common	***Scientific***
Velvetleaf	*(Abutilon theophrasti)*
Tree of Heaven	*(Ailanthus altissima)*
Common burdock	*(Arctium minus)*
Downy brome, cheatgrass	*(Bromus tectorum)*
Chicory	*(Cichorium intybus)*
Poison hemlock	*(Conium maculatum)*
Field bindweed	*(Convolvulus arvensis)*
Quackgrass	*(Elymus repens)*
Redstem filaree	*(Erodium cicutarium)*
Halogeton	*(Halogeton glomeratus)*
Common St. Johnswort	*(Hypericum perforatum)*
Wild proso millet	*(Panicum miliaceum)*
Bulbous bluegrass	*(Poa bulbosa)*
Perennial sowthistle	*(Sonchus arvensis)*
Johnsongrass	*(Sorghum halepense)*
Puncturevine	*(Tribulus terrestris)*
Siberian elm	*(Ulmus pumila)*
Common mullein	*(Verbascum thapsus)*

Watch List Species (19)

These species are not regulated by the Noxious Weed Act/Rule.

Common	***Scientific***
Garlic mustard	*(Alliaria petiolata)*
Common bugloss	*(Anchusa officinalis)*
Tall Oatgrass	*(Arrhenatherum elatius)*
Onionweed	*(Asphodelus fistulosus)*
Hoary alyssum	*(Berteroa incana L.)*
Caucasian bluestem	*(Bothriochloa bladhii)*
Yellow bluestem	*(Bothriochloa ischaemum)*
White bryony	*(Bryonia alba)*
Scotch broom	*(Cytisus scoparius)*
Baby's breath	*(Gypsophila paniculata)*
Meadow hawkweed	*(Hieracium caespitosum)*
Perennial Sweet Pea	*(Lathyrus latifolius)*
Garden loosestrife	*(Lysimachia vulgaris)*
Common reed	*(Phragmites australis)*
Yellow mignonette	*(Reseda lutea)*
Himalayan blackberry	*(Rubus armeniacus)*
Swainsonpea	*(Sphaerophysa salsula)*
Ventenata grass	*(Ventenata dubia)*
Syrian beancaper	*(Zygophyllum fabago)*

EL PASO COUNTY

COLORADO

Parks and Community Services Department
Environmental Division

Noxious Weeds and Control Methods

Purple loosestrife
(EPC Environmental Division)

Orange hawkweed
(EPC Environmental Division)

Canada thistle
(EPC Environmental Division)

For More Information Contact:

El Paso County Parks & Community Services Department
Environmental Division
3255 Akers Drive
Colorado Springs, CO 80922-1503

EVSnoxiousweeds@elpasoco.com
www.elpasoco.com

Updated 2024

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What is a Noxious Weed?

In 1996 the Colorado Noxious Weed Act (Title 35, Article 5.5) was passed to control noxious weeds in the state. "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.

Plants are prioritized as List A, B, or C species by the Colorado Department of Agriculture (CDA).

List A: Rare noxious weeds that must be eradicated statewide.

List B: Discretely distributed noxious weeds that must be eradicated, contained, or suppressed, depending on their location, to stop their continued spread.

List C: Widespread and well-established noxious weeds in Colorado; control is recommended by the state and may be required by local government.

Watch List: Intended to serve advisory and educational purposes only. Identification and reporting of these species to determine future potential status of species as noxious weeds.

For more information on noxious weeds: https://ag.colorado.gov/conservation/noxious-weeds

Why are Noxious Weeds a Threat?

Noxious weeds impose a wide variety of negative impacts on people, wildlife, and the environment. Livestock production and crop yields can be greatly reduced as well as adding the significant costs of weed management. Noxious weeds can also reduce the value of land by over 50% when infestations are severe.

Wildlife habitat and forage are severely degraded by noxious weeds, often rendering the land totally unusable to native animals. Noxious weeds are capable of displacing native plant communities and forming monocultures in their stead, as well as threatening r are and endangered plants.

Many noxious weeds alter or damage environmental processes like hydrology, nutrient cycling, and fire cycles, or degrade the environment by increasing soil salinity or erosion. Many recreational activities such as hiking, biking, fishing, hunting, bird watching, and boating are also negatively impacted by noxious weeds.

A few noxious weed facts:

- Cost of invasive species in the United States exceeds $138 billion per year.
- Purple loosestrife costs $45 million per year in control costs and forage losses in the U.S.
- If left untreated, noxious weeds will spread at a rate of 4,600 acres per day nationwide.
- A single hoary cress plant can spread over an area of 12 ft. in diameter in one year.

How can Noxious Weeds be Managed?

The most effective way to control noxious weeds is through Integrated Weed Management (IWM). IWM incorporates weed biology, environmental information, and available management techniques to create a management plan that prevents unacceptable damage from noxious weeds, and poses the least risk to people and the environment. IWM is a combination of treatment options that, when used together, provides optimum control for noxious weeds; however, IWM does not necessarily imply that multiple control techniques have to be used or that chemical control options should be avoided.

- **Prevention:** The most effective, economical, and ecologically sound management technique. The spread of noxious weeds can be prevented by cleaning equipment, vehicles, clothing, and shoes before moving to weed-free areas; using weed-free sand, soil, and gravel; and using certified weed-free seed and feed.

- **Cultural:** Establishing healthy native or other desirable vegetation. Methods include proper grazing management (prevention of overgrazing), re-vegetating or re-seeding, fertilizing, and irrigation.

- **Biological:** The use of an organism such as insects, diseases, and grazing animals to control noxious weeds; useful for large, heavily infested areas. Not an effective method when eradication is the objective, but can be used to reduce the impact and dominance of noxious weeds.

- **Mechanical:** Manual or mechanical means to remove, kill, injure, or alter growing conditions of unwanted plants. Methods include mowing, hand-pulling, tilling, mulching, cutting, and clipping seed heads.

- **Chemical:** The use of herbicides to suppress, kill, or prevent germination of noxious weeds by disrupting biochemical processes unique to plants.

Whether eradication or suppression is the objective of noxious weed management, priority should always be given to restoring desirable vegetation and a healthy ecosystem to prevent further noxious weed infestations. Depending on the severity of the infestation and the species present, control may take two or more seasons. Prevention of infestation by noxious weeds is the cheapest, most efficient way to control noxious weed populations. Take decisive action quickly and early when noxious weeds are present to save time and money.

This booklet lists chemical controls for noxious weeds as recommended by the Colorado Department of Agriculture (CDA). **Always read and follow the product label** to ensure proper use and application.

For more information regarding agents listed for biological control, contact the CDA Palisade Insectary at 970-464-7916 or 1-866-324-2963.

Dyer’s woad

LIST A

Dyer's woad - *Isatis tinctoria*

A winter annual, biennial, or short-lived perennial. Thrives in light sandy and gravelly soils with minimum water. Ranges from 1 to 4 feet tall with a deep taproot. Causes loss of livestock forage by displacing native species. Dyer's woad is an abundant re-seeder and impacts native plant communities by outcompeting native plants.

Identification:

- Leaves: White mid-rib on upper surface.
- Flowers: Numerous, yellow, and very small.
- Seeds: Pods turn dark purple to black.

Control methods:

Early detection and control when infestations are small, as well as long term management and monitoring, are essential to ensure eradication.

Biological:

Not approved for Dyer's woad, which is a List A species, as eradication is the management objective.

Mechanical:

Hand-pulling or digging when soil is moist are effective control methods. Bag plants carefully to contain seeds if the plant is flowering.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Metsulfuron: Apply during rosette to bloom stages.

Chlorsulfuron: Apply at the rosette to early bolt growth stage.

Hairy willow-herb

LIST A

Hairy willow-herb - *Epilobium hirsutum*

A perennial, hairy willow-herb can grow up to 6 feet tall. The plant is covered with fine hairs. The leaves look like those of a willow, therefore the name "willow-herb." The flowers are very showy, rose to purple color. They have notched petals with white centers and creamy white stigmas. The fruit has silky white hairs with small seeds attached. This semi-aquatic plant reproduces by rhizomes, seeds or fragments of the plant.

Identification:

- Leaves: Mostly opposite with toothed leaves.
- Flowers: Four separate petals, four separate sepals, deep pink.
- Seeds: Mature plant can produce up to 70,000 seeds. Seeds have long white hairs that are dispersed by the wind.

Control methods:

Biological:

Not approved for Hairy willow-herb, which is a List A species, as eradication is the management objective.

Mechanical:

Hand-pull or dig while infestation is still small prior to flowering, removing all roots. Follow-up and perseverance is important.

Chemical:

Recommendations only! Always read, understand and follow the label.

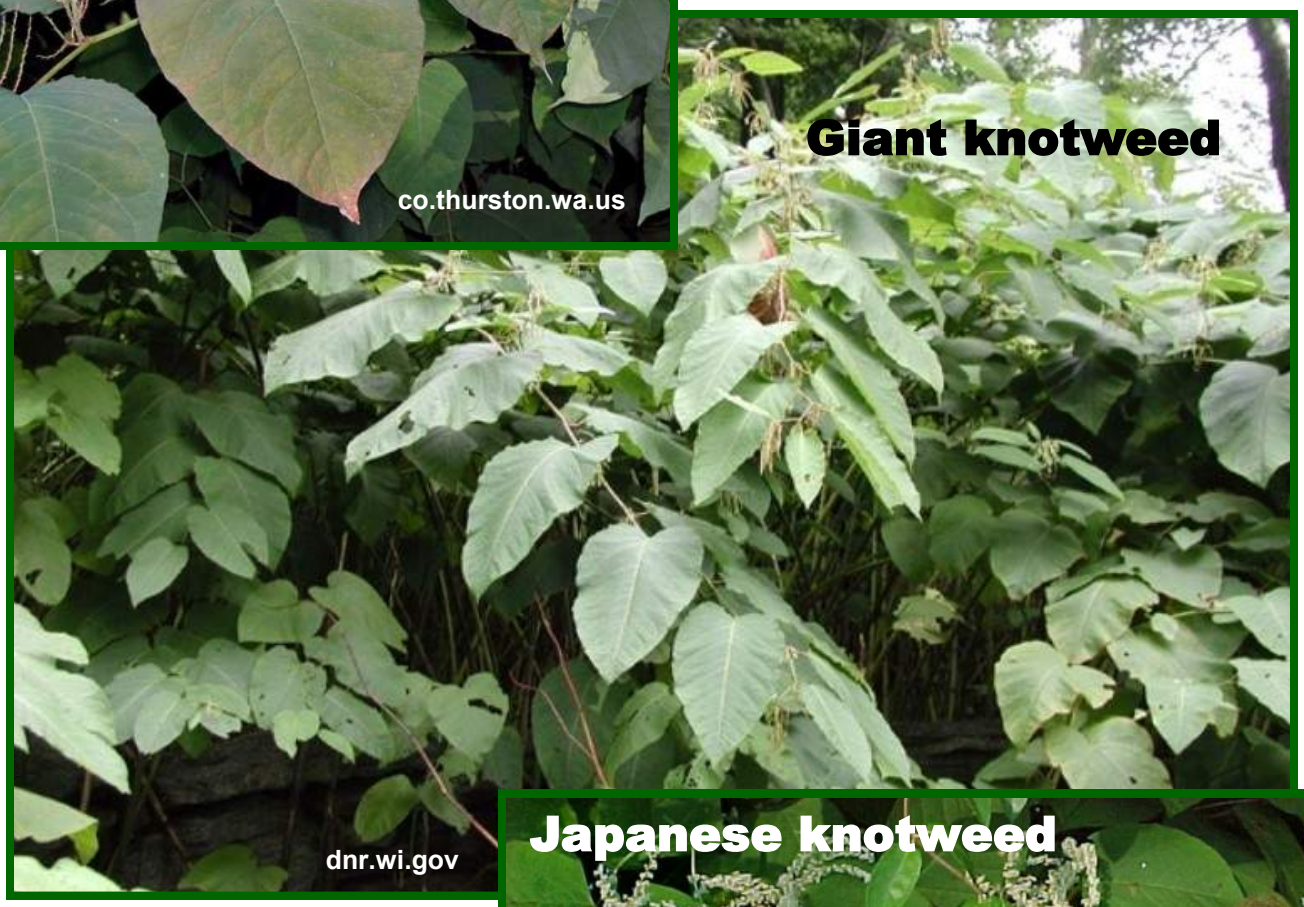
The label is the law!

Imazapyr: Treat in pre-bud to flowering stage.

Glyphosate (Aquatic): Pre-bud to flowering stage, at least half of the foliage should still be green.

Knotweeds


Bohemian knotweed
co.thurston.wa.us


Giant knotweed
dnr.wi.gov


Japanese knotweed
cumberlandcd.com

LIST A

Giant knotweed - *Fallopia sachalinense*
Japanese knotweed - *Fallopia japonica*
Bohemian knotweed - *Fallopia* x *bohemicum*

Bright green, bamboo-like perennial plants that grow from 5 to 16 feet tall and spread through roots and root fragments. Introduced from Asia as an ornamental, for erosion control and landscape screening. The knotweeds can tolerate many environmental conditions, including high temperatures and drought. Infestations can clog small waterways, displace native vegetation and degrade wildlife habitat. Bohemian knotweed is a hybrid of giant and Japanese knotweed.

Identification:

- Leaves: Heart-shaped and bright green.
- Flowers: Small, showy, greenish-white, in clusters.
- Stems: Hollow between nodes and swollen at nodes.

Control methods:

Biological:

Not approved for the knotweeds, which are List A species, as eradication is the management objective.

Mechanical: Not recommended due to extensive root system.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Glyphosate (Aquatic): Apply evenly over leaf surface to wet, not dripping. Treat when plants are actively growing.

Glyphosate (Aquatic): Use calibrated injection gun to inject just below the third node from July to September.

Triclopyr OR *Imazapyr* (Aquatic): Apply to leaf surface to wet, not drip. Treat when actively growing. (Do not use Injection for these herbicides.)

Myrtle spurge

LIST A

Myrtle spurge - *Euphorbia myrsinites*

A tap-rooted, low-growing perennial with trailing fleshy stems. Also known as donkey-tail spurge. Leaves and stems have a toxic, milky sap that can cause severe skin irritations. All plant parts considered poisonous. Escaped ornamental, popular in xeriscape and rock gardens.

Identification:

- Leaves: Fleshy, blue-green.
- Flowers: Yellow-green bracts; blooms in early spring.
- Seeds: Projected up to 15 feet; viable for up to 8 years.

Control methods:

Biological:

Not approved for Myrtle spurge, which is a List A species, as eradication is the management objective.

Mechanical:

Hand-pull prior to seed set, wear rubber gloves and eye protection. Follow-up is important.

Chemical:

Recommendations only! Always read, understand and follow the label.

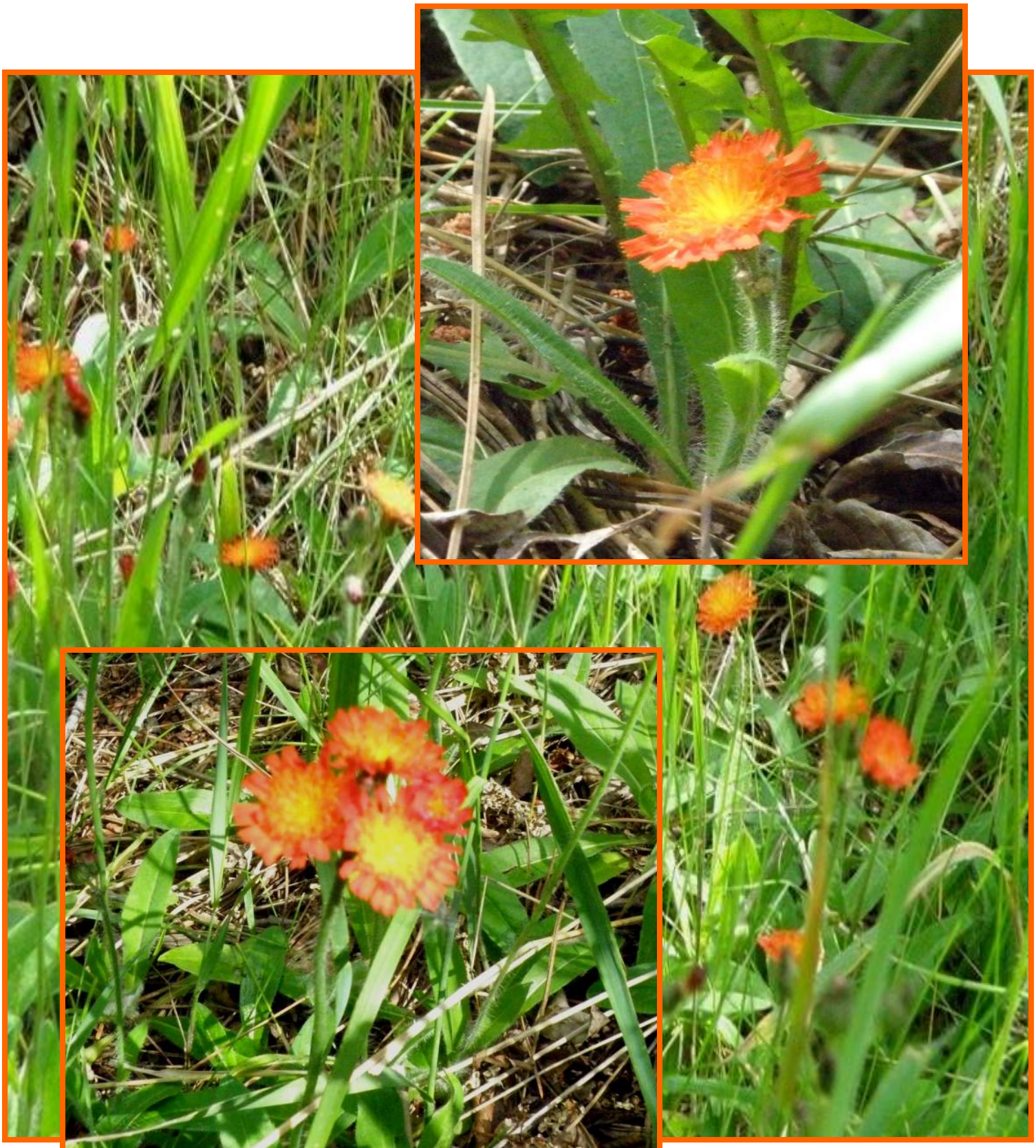
The label is the law!

2,4-D ester: Apply in spring or during fall re-growth.

Dicamba + 2,4-D: Apply in spring or during fall re-growth.

Picloram + 2,4-D: Apply when flowering or during fall re-growth.

Orange hawkweed



LIST A

Orange hawkweed - *Hieracium aurantiacum*

A perennial plant that has 5 to 35 bright red-orange, dandelion-like flower heads per stem. The stems and leaves are hairy and bristly and contain a milky juice. Plant reproduces from seeds and underground rhizomes.

Identification:

- Leaves: Basal, occasionally 1 or 2 small leaves on the stem, rosette leaves very hairy.
- Flowers: Red-orange flowers, petals have notched tips.
- Stems: Hairy, contain a milky sap.

Control methods:

Biological:

Not approved for orange hawkweed, which is a List A species, as eradication is the management objective.

Mechanical:

Not recommended because of ability to reproduce by stolons, rhizomes, and root fragments.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminopyralid: Apply when plants are in rosette to bolting stage.

Clopyralid: Apply when plants are in the rosette growth stage.

Clopyralid + 2,4-D: Apply when plants are in the rosette growth stage.

Purple loosestrife

LIST A

Purple loosestrife - *Lythrum salicaria*

Escaped ornamental that often grows on riverbanks and in wet areas. Pieces of roots and stems can produce new plants, and a mature plant can produce up to 3 million seeds per year that can remain viable in the soil for 5 to 20 years. This plant is one of the most invasive in the United States.

Identification:

- Leaves: Whorled, smooth edges, 2 to 5 inches long, lance-shaped.
- Flowers: Purple, crushed look, 5 to 7 petals, long flower stalk.
- Stems: Four-sided (square).

Control methods:

Early detection and control when infestations are small, as well as long-term management and monitoring, are essential to ensure eradication.

Biological:

Not approved for purple loosestrife, which is a List A species. Eradication is the management objective.

Mechanical:

On small infestations, remove by hand prior to seed set trying not to leave any stem/root fragments behind. If flowering, clip all flowers and buds, bag them, then apply herbicide to plant.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Check for aquatic-approved herbicides if growing on or near the water.

Triclopyr: Apply in the summer. If plants are flowering, clip, bag, and dispose of flower heads before applying.

Glyphosate (aquatic): Apply in summer during flowering stage. Clip, bag, and dispose of flower heads before applying.

2,4-D Amine (aquatic): Apply in early spring. Will prevent seed formation only. Re-treatment will be necessary.
DO NOT apply when outside temperatures exceed 85 degrees.

Yellow flag iris

Images courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

LIST A

Yellow flag iris - *Iris pseudacorus*

An herbaceous perennial which grows in semi-aquatic, wetland conditions. Plants are found in places such as stream and river edges, lakes, and ponds. Forms dense monocultures that grow and expand aggressively to outcompete native vegetation. Plants can grow 3 to 6 feet in height from pink-fleshed rhizomes that grow and divide rapidly. The only yellow iris found in Colorado wetlands. Reproduces mainly by rhizome division, but also seed production. Each pod can have up to 120 seeds which can float for up to two months.

Identification:

- Leaves: Blue-green, cattail-like, long, flat, broad, pointed at the tip.
- Flowers: Bright yellow, several per each inflorescence. Three petals and three sepals.
- Stems: Inflorescence stems are round.

Control methods:

Biological:

Not approved for yellow flag iris, which is a List A species. Eradication is the management objective.

Mechanical:

Small infestations may be dug by hand, follow-up treatment and monitoring will be required. Collect as much of the removed plants as possible to prevent re-growth from rhizome pieces left behind. Ineffective mechanical removal can do more harm than good. Remove and bag all flowering stalks, seed pods, and rhizomes.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Glyphosate (Aquatic)*:* Late spring to early summer.

Imazapyr (Aquatic)*:* Good for fall applications on mature plants.

Bouncingbet

LIST B

Bouncingbet - *Saponaria officinalis*

An escaped ornamental forb that reproduces by seed and rhizomes. This perennial plant can be poisonous to livestock and humans. Prefers moist, well-drained soils in full sun. Is often found in municipal areas and surrounding natural areas. Eradication is required in all of El Paso County.

Identification:

- Leaves: Opposite, smooth, narrow, 2 to 4 inches long, 3 distinct veins from the leaf base.
- Flowers: White to light pink, 5 petals, clustered at branch ends, slightly notched apex.
- Stems: Three feet tall, erect, sparingly branched, smooth and forming.

Control methods:

Biological:

No biological control available.

Mechanical:

Not recommended due to extensive root system. Hand-pull or dig individual plants, removing all roots when the soil is moist. Prevent seed production by clipping and disposing of flower heads.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Chlorsulfuron: Apply at bolting to bud stage, late spring to mid-summer.

Sulfometuron: Apply at bolting to bud stage, late spring to mid- summer.

Picloram: Apply at bolting to bud growth. Do not apply near trees, shrubs or water.

Bull thistle

LIST B

Bull thistle - *Cirsium vulgare (Savi) Tenore*

A biennial forb introduced as a seed contaminant. Mature plants produce up to 4,000 seeds. Presence of bull thistle in hay decreases forage and lowers market value. Will grow on gravel and clay-textured soils. Bull thistle can be distinguished from musk thistle by the presence of winged spines extending to the flower heads. Eradication is required in all of El Paso County.

Identification:

- Leaves: Prickly-hairy on top and cottony underneath.
- Flowers: Gum-drop shaped, pinkish to dark purple.
- Seeds: Capped with circle of plume-like white hairs.

Control methods:

Biological:

No biological control available in Colorado.

Mechanical:

Sever the root below the soil surface before plant produces flowers.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminopyralid: Apply to rosettes through bolting stage in spring or to fall rosettes.

Chlorsulfuron: Apply in spring from bolting to bud stages.

Clopyralid: Apply to rosettes through flower bud stage in spring or to fall rosettes.

Aminocyclopyrachlor + chlorsulfuron: Apply from seedling to bolting stage.

Canada thistle

LIST B

Canada thistle - *Cirsium arvense*

A deep-rooted perennial that spreads mainly through an aggressive rhizomatous root system, but also through seed production. Often grows in wet areas, but can grow in a variety of habitats. Small pieces of root (1/4 inch) can form new plants. Tilling and hand-pulling stimulate the growth of plants and are not an effective means of control.

Identification:

- Leaves: Spine-tipped, dark green, oblong, and crinkled.
- Flowers: Small purple (sometimes white) clusters on ends of branches.
- Stems: Hollow and spineless.

Control methods:

Biological: Grazing by cattle, goats, and sheep when plants are young. Insects available but have not shown effective control.

Rust fungus (*Puccinia punctiformis*) collection and distribution methods are being refined.

Mechanical: Neither hand-pulling or tilling is an option. Mowing can be effective if done every 10 to 21 days during the growing season. Especially effective when combined with a fall herbicide treatment.

Chemical:
Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminopyralid: Apply in spring until flowering and/or to fall re-growth. Especially effective in fall after the first light frost.

Clopyralid + *triclopyr*: Apply in spring until flowering or fall regrowth.

Aminoclopyrachlor + *chlorsulfuron*: Effective from rosette to bud stage, also to fall regrowth.

Chinese clematis

LIST B

Chinese clematis - *Clematis orientalis*

A perennial, herbaceous-to-woody climbing vine that is capable of completely covering trees and bushes, causing death to young trees and shrubs. An escaped ornamental that prefers well-drained soils and sunny locations, and is often found along roadsides, riparian areas, and rocky slopes. Eradication is required in all of El Paso County.

Identification:

- Flowers: Solitary, four yellow sepals (petal-like), often nodding.
- Fruits: Feathery, long-tailed, conspicuous all winter.
- Roots: Five to ten feet long.

Control methods:

Biological: No biological control agents available.

Mechanical: Pull or dig up the plant prior to flowering when soil is moist; remove all roots.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

2,4-D amine: Apply whenever plant is actively growing. (will damage neighboring broadleaf species if present).

Imazapic: Apply at flowering growth stage (fall).

Aminopyralid: Apply at flowering growth stage (fall).

Common teasel

LIST B

Common teasel - *Dipsacus fullonum*

A biennial or sometimes monocarpic perennial forb that can grow up to 6 feet tall. Generally found along irrigation ditches, rivers, abandoned fields, pastures, waste areas, and forests. Can produce more than 2,000 seeds per plant, and seeds can stay viable for up to 14 years. Plants die after seed production.

Identification:

- Flowers: Purple or white and egg-shaped with long floral bracts.
- Leaves: Clasp the stem and appear wrinkled.
- Fruits: Four-angled achene, each containing a single seed.

Control methods:

Biological: No biological control agents available.

Mechanical: Sever roots below soil surface during rosette stage. Cutting plants near flowering stage can be effective. Re-visit the site frequently to ensure re-growth does not occur with cut plants.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Metsulfuron: Apply when in rosette or bolting growth stage.

Aminopyralid: Apply when in rosette or bolting stage.
Best choice of herbicide in riparian areas.

Imazapic: Apply when in rosette or bolting stage.
Good herbicide choice in riparian areas.

Aminocyclopyrachlor + *chlorsulfuron*: Apply from seedling to bolting.

Dalmatian toadflax

LIST B

Dalmatian toadflax - *Linaria dalmatica*

A perennial forb introduced from the Mediterranean as a folk remedy, fabric dye, and ornamental. Grows up to 3 feet high in disturbed open sites, fields, pastures, rangelands, and wildlife habitats. Reproduces by seed (up to 500,000 per plant) and extensive, creeping rhizomes. Eradication is required in all of El Paso County.

Identification:

- Flowers: Showy yellow snapdragon-like with an orange throat.
- Leaves: Thick, waxy, bluish, heart-shaped, and wraps the stem.
- Roots: Early spring regeneration from vegetative buds.

Control methods:
Controlling toadflax is expensive and difficult. Control when infestations are small, but prevention is the best option.

Biological:

Calophasia lunula - a predatory noctuid moth, feeds on flowers and leaves.

Eteobalea intermediella - root boring moth.

Mecinus janthinus - a stem boring weevil

Mechanical:

Pulling by hand can be effective for small infestations. Pull every year (5 to 6 years) to deplete root system reserves.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminocyclopyrachlor + chlorsulfuron:
Apply when flowering, in spring or to fall regrowth.

Picloram: Apply when flowering, in spring and/or to fall regrowth.

Chlorsulfuron: Apply when flowering, in spring or to fall regrowth.

Diffuse knapweed

LIST B

Diffuse knapweed - *Centaurea diffusa*

A tap-rooted plant that is a biennial forb. It reproduces by seeds only, and is capable of producing 18,000 seeds per plant. Following seed production, the plant dries out and takes the form of a tumbleweed, spreading seeds great distances.

Identification:

- Flowers: Usually white, sometimes lavender; spiny bracts with a distinct central spine and fringed comb-like edges.
- Leaves: Finely divided, become reduced as plant matures.

Control methods: Prevent seed production.

Biological:

Insects listed below provide good control when used together, but may take 3 to 5 years to establish and achieve optimum results.

Seedhead weevil - *Larinus minutus*
Root weevil - *Cyphocleonus achates*

Mechanical:

Sever the taproot below ground prior to flowering. Mowing is effective at or just before full-bloom; plant parts must be disposed of properly as seed can still develop on cut plants.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminocyclopyrachlor + chlorsulfuron:
Use as a pre-emergent or apply from seedling to mid-rosette stage.

Aminopyralid:
Rosette to early bolt stage (spring) and/or in the fall to the rosettes.

Clopyralid:
Apply in spring or fall to rosettes before flowering stalk lengthens.

Hoary cress

LIST B

Hoary cress - *Lepidium draba*

A.K.A. whitetop, this perennial member of the mustard family (*Brassicaceae*) reproduces by seeds and creeping rhizomes. One of the first noxious weeds to emerge in the spring, it flowers in early spring and sets seed by mid-summer. Single plants are capable of producing as many as 4,800 seeds that can remain viable in the soil for about 3 years. Hoary cress prefers moderate precipitation, alkaline soils, lots of sun, and disturbed sites, and can grow in a variety of habitats.

Identification:

- Flowers: White with four petals, flat-topped flower clusters.
- Leaves: Grayish-green, lance-shaped, serrated edges, blunt ends.
- Seeds: Heart-shaped capsules hold two flat reddish-brown seeds.

Control methods:

Biological:

No biological control available.

Mechanical:

Mow frequently in early spring before Hoary cress bolts to stress the plants followed by a herbicide application. Mow several times during the summer prior to a fall herbicide application for further control.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Chlorsulfuron: Apply while flowering. (Early spring to early summer)

Metsulfuron: Apply while flowering. (Early spring to early summer)

Imazapic: Apply at late-flower to post-flower growth. (Late spring to mid-summer)

Houndstongue

LIST B

Houndstongue - *Cynoglossum officinale*

A short-lived perennial or biennial forb. Produces rosettes in the first year, and bolts a stout, erect stem that is 1 to 4 feet tall by mid-summer of the second year. Seeds have barbs like Velcro and will cling to animals, clothing, and machinery. Houndstongue is poisonous and can be lethal to wildlife and livestock. Eradication is required in all of El Paso County.

Identification:

- Flowers: Reddish-purple with 5 petals and 5 soft, hairy sepals. Slightly drooping from densely clustered panicles.
- Leaves: Lance shaped, with a smooth edge and no teeth or lobes. Leaf tip is sharply pointed, like a hound's tongue and covered with soft hairs.
- Seeds: Prickly teardrop-shaped nutlets in a pyramid-shaped receptacle.

Control methods:

Biological:

No biological control has been approved for use in Colorado.

Mechanical:

Cut or pull plants, remove entire root crown when plants are in rosette stage.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Metsulfuron + 2,4-D: Rosette to early flower growth stages.

Chlorsulfuron + 2,4-D: Rosette to early flower growth stages.

Metsulfuron + chlorsulfuron: Rosette to early flower growth stages.

Leafy spurge

LIST B

Leafy spurge - *Euphorbia virgata*

A long-lived perennial that emerges early in spring with an extensive creeping root system. Roots can extend to a depth of 30 feet. Plants contain a milky latex that can damage sensitive skin and eyes. A single plant can produce up to 130,000 seeds that can be projected up to 15 feet from the plant, these seeds are capable of remaining viable in the soil for at least 8 years. The plant also reproduces from the large numbers of vegetative buds on its roots.

Identification:

- Flowers: Small, enclosed by yellowish-green heart-shaped bracts.
- Leaves: Alternate, narrow, and linear.
- Stems: Erect, 1 to 3 feet tall, unbranched except at flower clusters.

Control methods:

Biological:

Both sheep and goats can be effective grazers of leafy spurge.

Three flea beetles (below) are available for control.

Flea beetle - *Ahpthona nigriscutis*

Flea beetle - *Aphthona czwalinae / lacertosa*

Flea beetle - *Ahpthona cyparissiae*

Mechanical:

Hand-pulling is not an option due to the vast root system. Frequent mowing can reduce seed production but will not provide long-term control.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminocyclopyrachlor + chlorsulfuron mixed with *Diflufenzopyr + dicamba:* While flowering (spring) or fall application.

Quinclorac mixed with *Diflufenzopyr + dicamba:* While flowering (spring) or fall application.

Aminocyclopyrachlor + chlorsulfuron: Post-emergence (spring) until flowering, or to rosettes (fall).

Musk thistle

LIST B

Musk thistle - *Carduus nutans*

A biennial thistle with very showy flowers producing up to 20,000 seeds per plant. Flower heads often bend over or nod, giving rise to the common name “nodding thistle.” Flowers emerge mid to late summer, seeds develop shortly after. Reproduces only by seeds. Often found in disturbed/ overgrazed areas, but can invade various habitats.

Identification:

- Flowers: Purple, rarely white,1.5 to 3 inches wide, nodding, solitary on stems; large triangular-shaped, spine-tipped bracts.
- Leaves: Spiny, dark green, white margins, prominent white midrib.
- Stems: Leaves usually absent or very reduced below flower. Stem smooth below flower head. Stem has winged spines throughout remainder of plant with spiny margined leaves.

Control methods:

Biological:

The crown weevil, *Trichosirocalus horridus,* is available for control.

Mechanical:

Sever the root below the soil surface prior to plant flowering in the rosette stage. Mowing is effective at full bloom, but flowering plant parts must be disposed of properly because seeds will develop on cut plants and germinate.

Chemical:

Recommendations only! Always read, understand and follow the label.

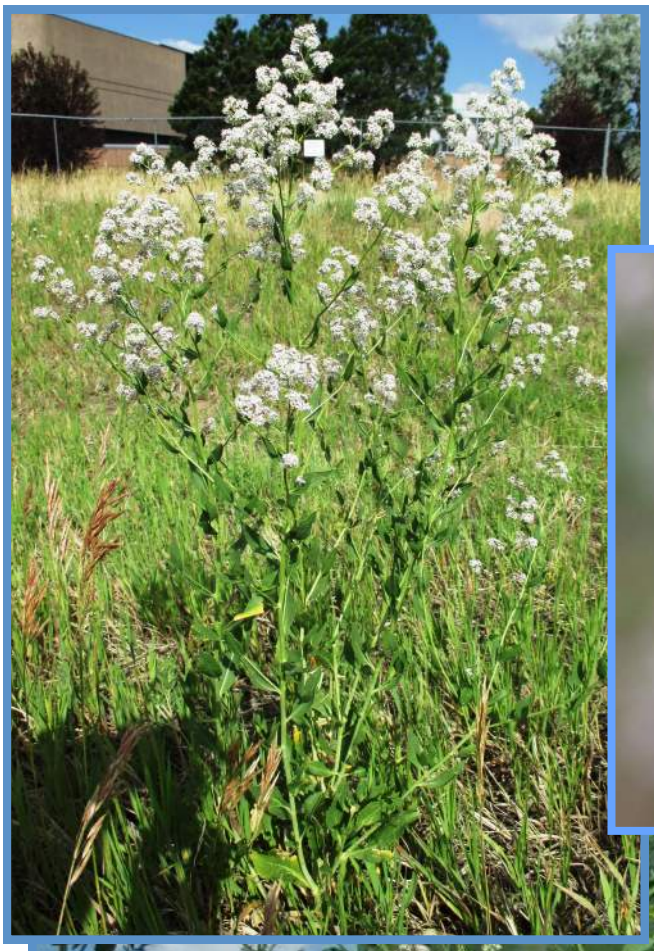
The label is the law!

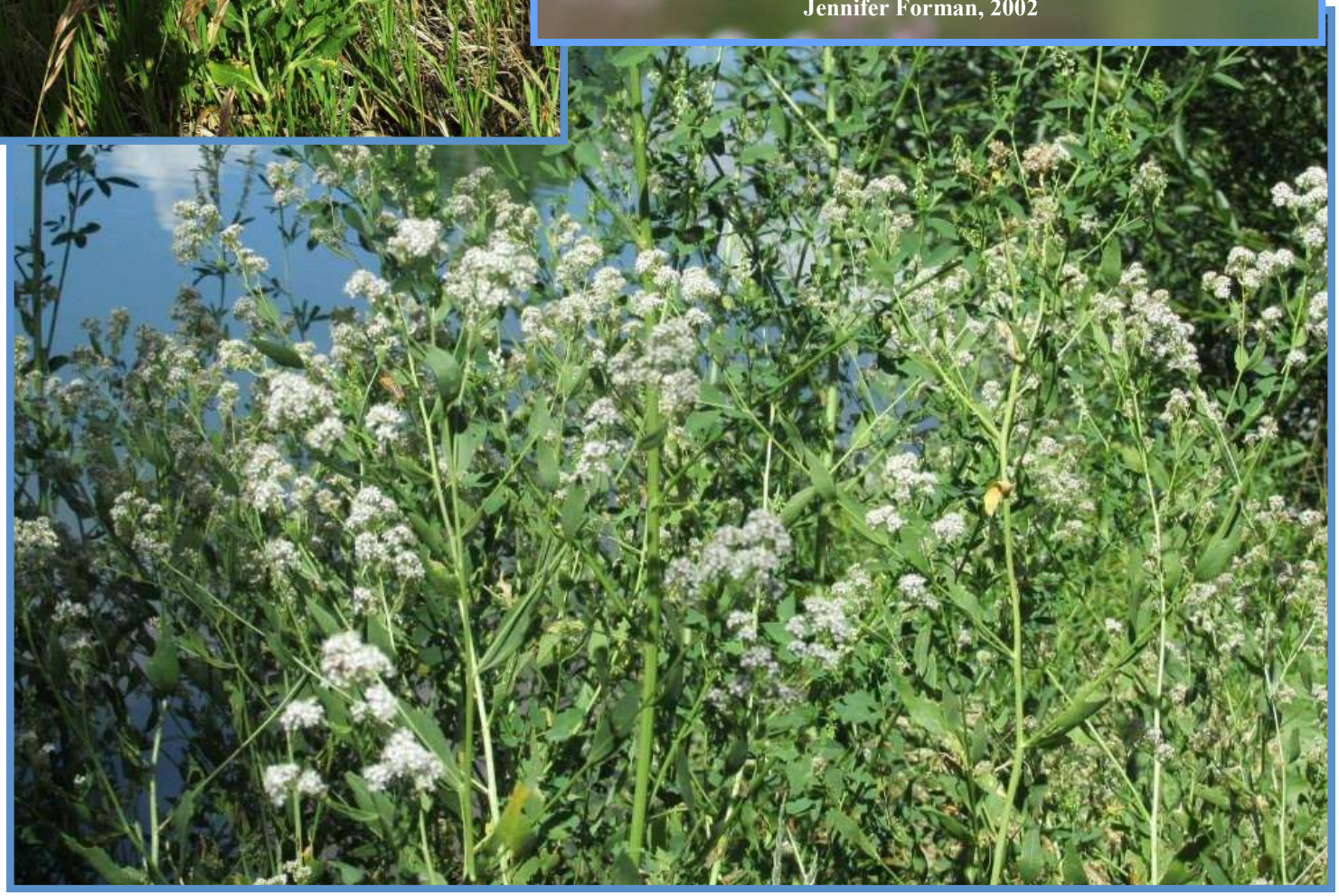
Aminopyralid: Apply in spring during rosette to early bolting stages, or to rosettes in fall.

Chlorsulfuron: Apply in spring from rosette through very early flowering stages.

Clopyralid: Apply to rosette through flower bud stage or to fall rosettes.

Perennial pepperweed





LIST B

Perennial pepperweed - *Lepidium latifolium*

A very invasive perennial forb. Plants act as “salt pumps” by absorbing salt from deep in the soil and then excreting salt and depositing it on the soil surface. Most desirable plants cannot tolerate high concentrations of salts so this plant is able to form a monoculture. Reproduction is by seed and roots. Plants range from one to five feet tall. Eradication is required in El Paso County.

Identification:

- Flowers: Tiny, white clusters on branch tips with four petals.
- Roots: Up to 10 feet deep into the soil.
- Leaves: Alternate, lance shaped, serrated edges.

Control methods:

Biological:

No biological control available.

Mechanical:

Most mechanical methods are not recommended and can increase the density of pepperweed. Spring mowing, combined with chemical treatments can be effective.

Chemical: Herbicides, when applied at the flower bud stage, are very effective. Repeat applications for up to five years.

Recommendations only! Always read, understand and follow the label.

The label is the law!

Chlorsulfuron: Apply from early flower to flowering growth stage.

Metsulfuron: Apply from early flower to flowering growth stage.

Imazapic: Apply from early flower to flowering growth stage.

Russian knapweed

LIST B

Russian knapweed - *Rhaponticum repens*

A deep-rooted, creeping perennial that reproduces primarily from adventitious buds on the roots, but it also reproduces from seed. The plant is allelopathic, meaning it exudes a toxic substance that inhibits the growth of surrounding plants. It is also toxic to horses, and prolonged consumption results in "chewing disease" which results in serious injury and/or death. Eradication is required in all of El Paso County.

Identification:

- Flowers: Pink to purple, urn-shaped, and solitary at the ends of upper branches, papery, rounded bracts.
- Stems: Upright, branched, covered in short stiff hairs.
- Roots: Aggressive, creeping, brown / black with a scaly appearance.

Control methods:

Biological:

J*aapiella ivannikovi* - Gall midge
Aulacidea acroptilonica - Gall wasp not yet available by CDA for distribution.

Mechanical:

Mow several times before plants bolt to stress them; works well when followed by a fall herbicide application. Mowing alone will stimulate shoot sprouting and increase infestation.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminopyralid: Apply in fall when stems die back or spring during early bolt before the flower buds form.

Aminocyclopyrachlor + *chlorsulfuron:* Apply in fall when stems die back or spring during early bolt prior to flower buds forming.

Russian olive

LIST B

Russian olive - *Elaeagnus angustifolia*

A fast-growing perennial shrub or small tree that reproduces through root suckers and seed. It possesses an extensive root system, and can grow on bare, mineral substrates within the soil. It tolerates many soil, light, and moisture conditions, but prefers open, moist, riparian areas and often out-competes native riparian vegetation. Prior to being listed as a noxious weed by the CDA, it was commonly used for erosion control and can be found in home landscaping.

Identification:

- Leaves: Narrow, linear, upper surface is light green, lower surface is silvery white.
- Branches: Twigs are reddish and flexible with 1” to 2“ thorns.
- Fruit: Olive-shaped, become yellow-red when mature.

Control methods:

Biological:

Tubercularia canker is an unapproved bio-control; however, it can girdle entire stems and kill stressed plants over time.

Mechanical:

Cut trees, then immediately treat stumps with an herbicide to prevent re-sprouting.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Triclopyr: Apply to the cambial layer of the tree immediately after the stump is cut or to the roots above soil surface.

Glyphosate (aquatic approved version): Apply to the cambial layer of the tree immediately after the stump is cut or to the roots above soil surface.

Scentless chamomile

LIST B

Scentless chamomile

- *Tripleurospermum inodorum*

An annual, biennial, or short-lived perennial forb that is native to Europe. Produces a dense mat that out-competes other plants. A single plant can produce 300,000 seeds. Seeds and flowers are continuously formed, producing many generations during the growing season. Eradication is required in all of El Paso County.

Identification:

- Flowers: Yellow-centered disk surrounded by white petals; daisy-like.
- Leaves: Alternate, finely divided, fern-like.
- Stems: From 6 inches to 2 feet tall with numerous branches.

Control methods:

Combine tillage, herbicide treatment and establish competitive plants.

Biological:

There is no biological control available at this time.

Mechanical:

Frequent shallow tilling can help exhaust seed bank. Hand pulling effective if repeated as new plants appear, prior to blooming.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Metsulfuron: Apply when plant is in rosette to bolting stage.

Chlorsulfuron: Apply when plant is in rosette to bolting stage.

Scotch thistle

LIST B

Scotch thistle - *Onopordum acanthium*
Scotch thistle - *Onopordum tauricum*

A non-native biennial forb that reproduces solely by seed. Can produce up to 14,000 seeds per plant. Due to spiny nature, Scotch thistle can act as a living barbed wire fence to livestock and can grow up to 12 feet tall. Invades overgrazed pastureland, roadsides, and irrigation ditches. Eradication is required in all of El Paso County.

Identification:

- Flowers: 2 to 5 clusters, purple to dark red in color, terminal with spine-tipped bracts.
- Leaves: Alternate, spiny with a distinct white mid-rib.
- Stems: Numerous, branched, with broad, spiny wings entire length of the stem.

Control methods:

Biological:

No known biological control agents are effective against Scotch thistle.

Mechanical:

Any physical method that severs the root below the soil surface prior to seed production will kill the plant. Properly dispose of cut flowering plants, as seeds can mature and become viable.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminopyralid: Apply in spring or fall during the rosette stage.

Chlorsulfuron: From bolting to flower bud stages.

Metsulfuron + Chlorsulfuron: Apply from rosette to flower bud stages.

Clopyralid: Apply to rosettes in spring or fall.

Aminocyclopyrachlor + chlorsulfuron: Apply from seedling to bolting stage.

Spotted knapweed

LIST B

Spotted knapweed - *Centaurea stoebe*

A short-lived perennial that reproduces mostly by seed. Each plant is capable of producing an average of 900 seeds annually. Plants tend to invade disturbed/overgrazed areas and can tolerate both dry conditions and high moisture areas.

Identification:

- Flower: Urn-shaped, pink to purple, solitary at the end of branches with black-tipped ("spotted") spiny bracts.
- Leaves: Alternate, deeply lobed; become smaller near the tips of the stem.
- Root: Stout taproot.

Control methods:

Biological:

The insects listed below are available for control:

Seedhead weevil - *Larinus minutus*

Root weevil - *Cyphocleonus achates*

This is a great option for large infestations; optimum results take 3-5 years.

Mechanical:

Dig when the soil is moist, removing all roots. Mow when the plants have flower buds or early flowers to stress the plant; all parts must be disposed of properly, as seed may still develop on cut plants.

Chemical:

Recommendations only! Always read, understand and follow the label.

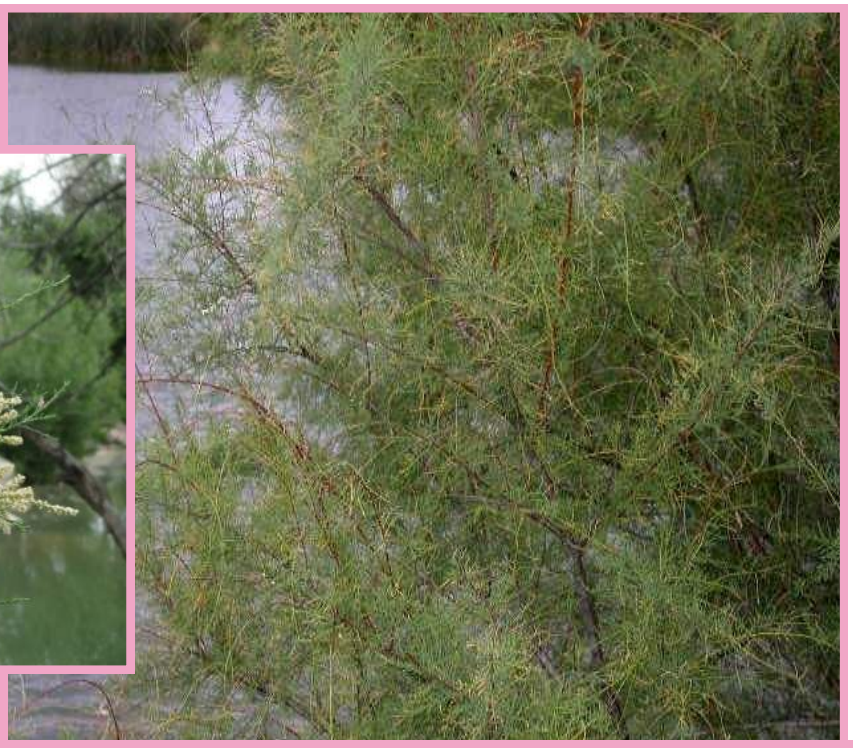
The label is the law!

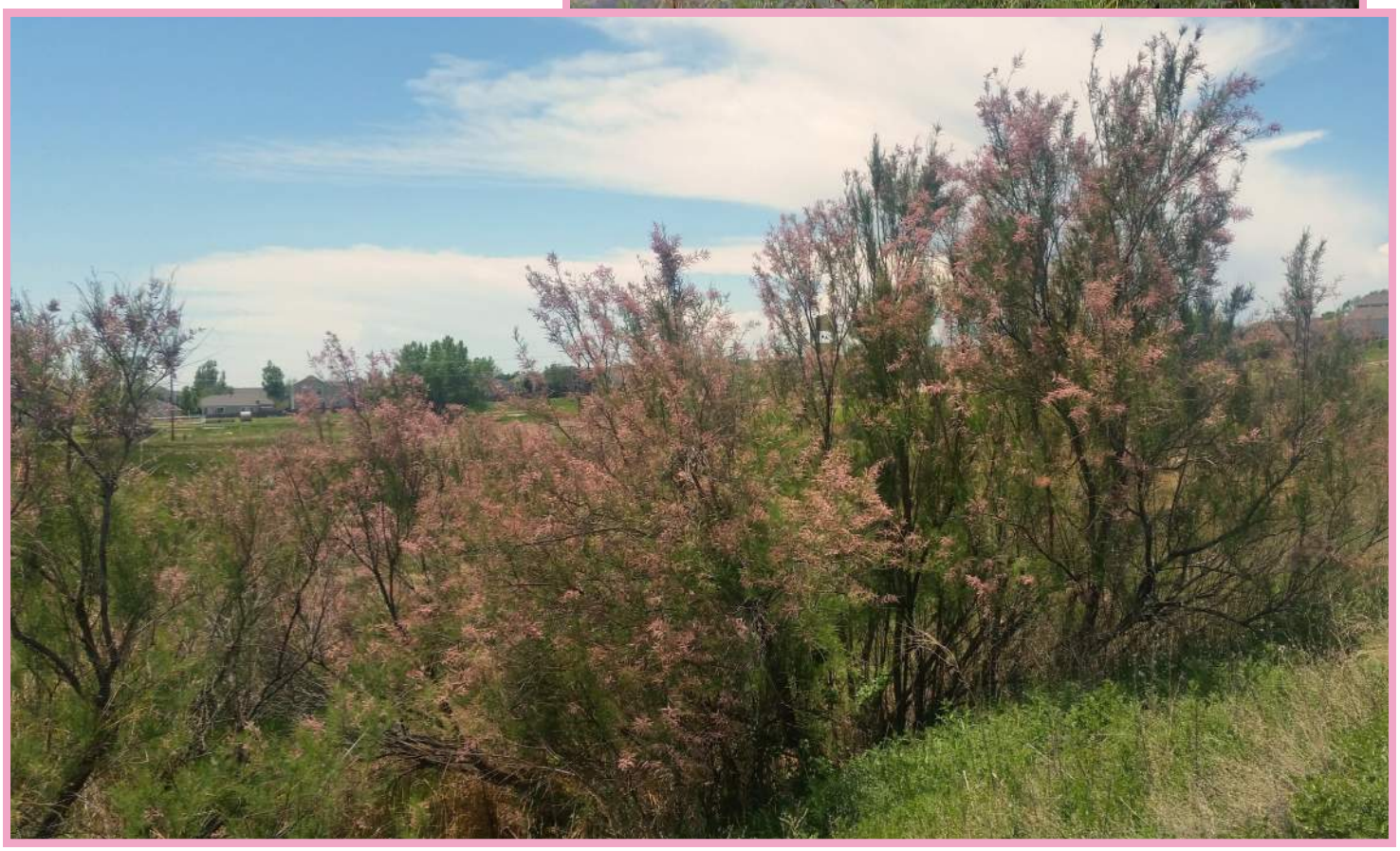
Aminocyclopyrachlor + chlorsulfuron:
Apply as a pre-emergent, or from seedling to mid-rosette stage.

Aminopyralid:
Apply in spring at the rosette to early bolt stage or in fall to the rosettes.

Clopyralid:
Apply to spring or fall rosettes. When plants bolt, mix with 2,4-D to treat.

Tamarisk





LIST B

Tamarisk (Saltcedar) - *Tamarix spp.*

A deciduous small shrub or tree that reproduces vegetatively and by seed. Mature plants can produce up to 600,000 seeds that are viable for up to 45 days. It increases the salinity of the soil surface, which favors its growth while hindering native plant growth. It is often found in floodplains, along river banks, stream banks, irrigation ditches, and marshes.

Identification:

- Flowers: Tiny, pink to white, 5 petals, slender racemes.
- Leaves: Small, scale-like (like juniper), bluish-green in color.
- Stems: Reddish-brown color.

Control Methods:

Biological:

Diorhabda carinulata - established throughout the state.
Diorhabda elongata - Saltcedar leaf beetle, limited distribution.

Mechanical:

Bulldozing can be used to open up large stands of salt cedar; follow up with herbicide treatment of re-growth when 3 to 6 feet tall.

The cut-stump method can be applied with a chainsaw, or loppers for smaller plants.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

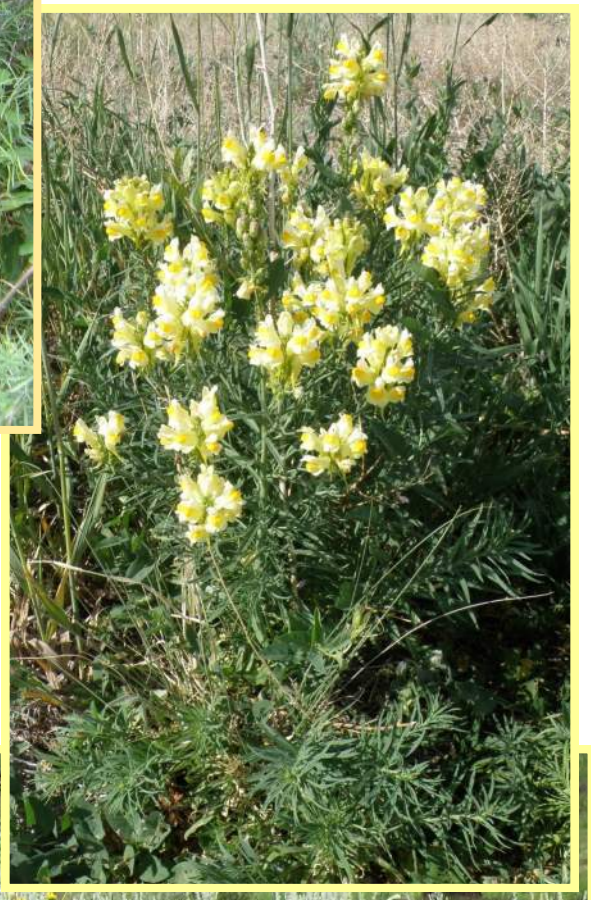
Cut-stump method refers to mechanically cutting down the tree and immediately applying herbicide to the stump.

Triclopyr: Cut-stump & basal bark - Summer to fall.

Glyphosate (Aquatic)*:* Cut-stump - Summer to fall. Treat the cambium immediately after cutting and to roots above the ground.

Triclopyr + Aminopyralid: Broadcast foliar treatment: Apply when plants are growing rapidly—May to September.

Yellow toadflax



LIST B

Yellow toadflax - *Linaria vulgaris*

A perennial with an extensive creeping root system that reproduces vegetatively, and also a prolific seed producer. It is well-adapted to moist or dry sites and is found in all soil types. Very competitive due to early spring emergence from vegetative buds on root stock. Herbicide control results can be highly variable. Known to be mildly poisonous to cattle, but has little effect to sheep or goats.

Identification:

- Flowers: Snapdragon-like, bright yellow with orange centers, long spur.
- Leaves: Narrow, linear, 1 to 2 inches long.
- Stems: Woody at the base and smooth toward the top, 1 to 3 feet tall.

Control Methods:

Controlling toadflax is expensive and difficult. Control when infestations are small. Prevention is the best option.

Biological:

The following insects are available for control:
Noctuid moth - *Calophasia lunula*
Root boring moth - *Eteobalea intermediella*
Stem-boring weevil - *Mecinus janthinus*

Mechanical:

Hand-pulling and tillage are not recommend due to its extensive creeping root system. A single new plant might be an exception.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Aminocyclopyrachlor + Chlorsulfuron:
Apply at flowering through fall post-flower into senescence.

Picloram + Chlorsulfuron:
Fall application, late August through September has best results.

Chicory


Rob Routledge, Sault College, Bugwood.org


Rob Routledge, Sault College, Bugwood.org
5498569


Ohio State Weed Lab, The Ohio State University, Bugwood.org
1555189

List C

Chicory - *Cichorium intybus*

This perennial forb is native to Eurasia. Plants initially appear as basal rosettes which resemble the common dandelion measuring 3 to 10 inches in length. Plants can be 3 to 5 feet tall with hollow stems, milky sap, and linear ribs. Has been cultivated for its long taproots as a coffee substitute and its leaves as greens. May be confused with our native blue flax (*Linum lewisii).* Prefers roadsides and disturbed areas and reproduces by seed throughout the growing season.

Identification:

- Inflorescences: One inch flowers with only ray flowers in clusters of one to three. Color ranges from cornflower blue to off white. Petals toothed.
- Leaves: Basal leaves resemble common dandelion. Stem leaves are rigid with smooth margins and short stiff hairs on both sides.
- Stems: Sticky to the touch. Branches spaced widely. Flowering stems appear later in the season.

Control Methods:

Biological: Sensitive to grazing by sheep, goats, and cattle.

Mechanical: Best for small infestations. Severing the flowering stems below the root crown may be effective but often requires follow-up treatment. Collect, bag and dispose of flowers and seeds. Mowing not recommended without being followed by herbicide treatment.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

2,4-D: Apply in rosette to bud stage.

Aminopyralid: Apply in rosette to bud stage.

Clopyralid: Apply in rosette to bud stage.

Common burdock

LIST C

Common burdock - *Arctium minus*

Common burdock is a biennial forb that comes from Europe. The first year of growth is a rosette with large, heart-shaped leaves that are very hairy. The second year of growth produces a branched, erect stem that ranges from 3 to 10 feet tall. Common burdock grows from a large, thick taproot and prefers moist soils, roadsides, waste places, streambanks, and fencerows. Flowering and seed production occurs from July to October.

Identification:

- Flowers: Pink to purple, sometimes white. Surrounded by hooked spines that dry into an easily dispersible bur around the seeds.
- Leaves: Dark green, heart shaped, toothed to wavy margins with dense hairs.
- Stems: Flowering stems arise the second year and are branched with flowers at the tips.

Control Methods:

Biological:

No biological control available.

Mechanical:

Hand pull or dig. Repeated mowing is effective. Prevent seed production and spread.

Chemical:

Recommendations only! Always read, understand and follow the label.

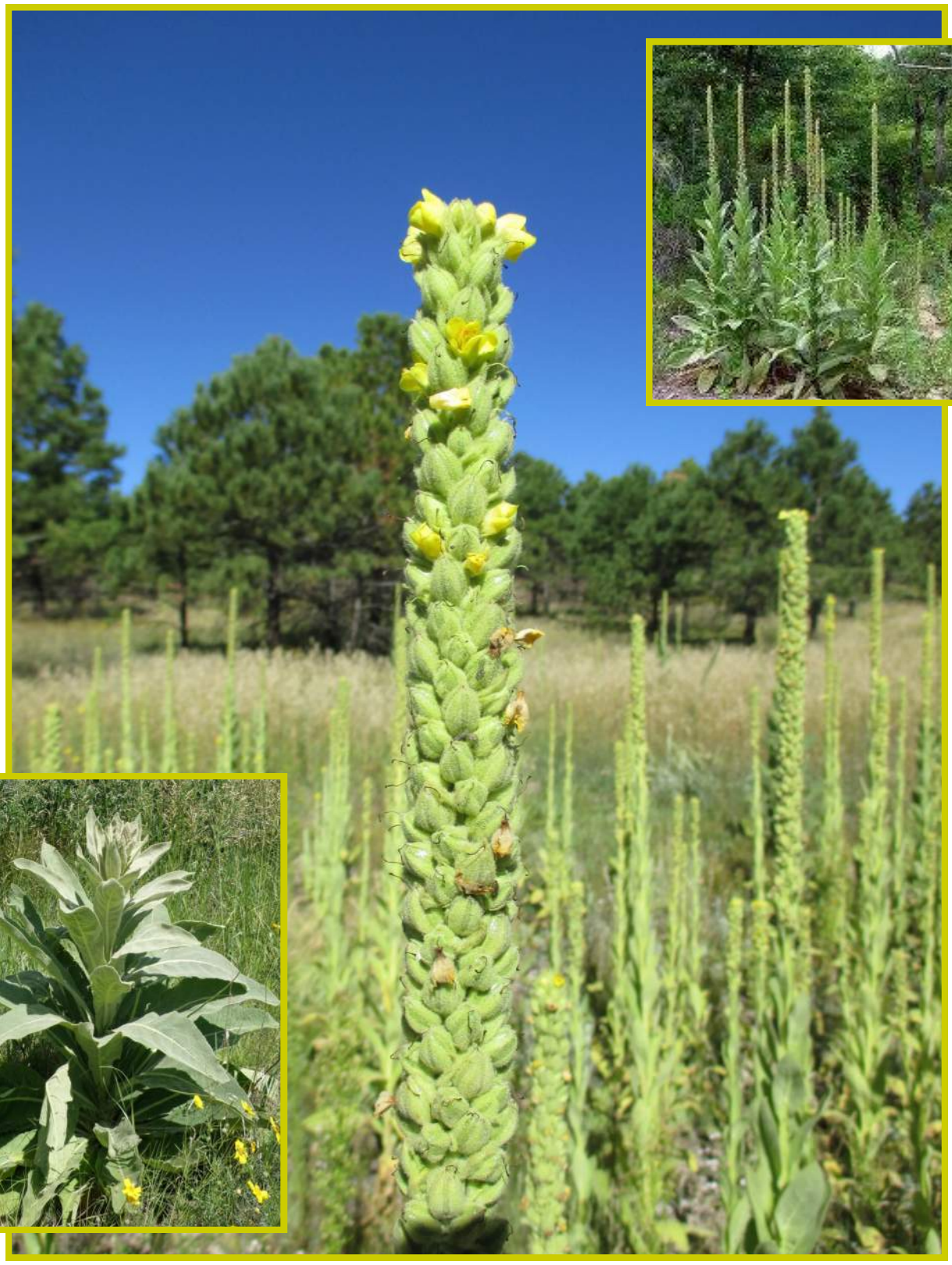
The label is the law!

Dicamba + 2,4-D: Apply to young, actively growing plants in spring.

Aminopyralid: Apply in rosette stage in spring or fall.

Clopyralid: Apply to young, actively growing plants in spring.

Common mullein



LIST C

Common mullein - *Verbascum thapsus*

Common mullein, often mistaken as a native plant, is a biennial plant that originated in Eurasia. It can be found in disturbed areas, preferring dry, stony soil. It reproduces by seed, up to 250,000 per plant, which can remain viable in the soil for over 80 years.

Identification:

- Flowers: Yellow, saucer-shaped, attached to stem.
- Leaves: Oblong, wooly, with a rounded tip.
- Stems: Erect, rigid up to 6 feet tall covered with wooly hairs.

Control Methods:

Biological:

No insect biological control available.

Mechanical:

Easy to pull before flowering due to shallow taproot. If flowers are present, bag and dispose of plants to prevent spread of seeds.

Chemical:

Recommendations only! Always read, understand and follow the label.

The label is the law!

Chlorsulfuron: Apply during rosette stages spring (before bolting) or fall.

2,4-D + Picloram: Apply during rosette stages spring (before bolting) or fall.

Picloram: Apply in spring at rosette stage to early growth or in fall to rosettes.

Metsulfuron: Apply in spring or fall to rosettes.

Poison hemlock

LIST C

Poison hemlock - *Conium maculatum*

This plant is native to Europe. Biennial with leaves that resemble parsley. The plants are easily confused with other members of the carrot family. Habits include wetland areas and roadside ditches. ALL parts of this plant are poisonous! Consumption can be fatal.

Identification:

- Flowers: White, umbrella-like clusters.
- Leaves: Fern-like, lacy.
- Stems: Hollow with purple spots. Four to eight feet tall.

Control Methods:

Biological:
Agonopterix alstroemericana, the hemlock moth larvae feed on the plant and cause sever defoliation and death of the plant.

Mechanical:
Hand pull or dig. ALWAYS wear gloves! Bag plants to contain seeds if flowering.

Chemical:
Recommendations only! Always read, understand and follow the label.

The label is the law!

2,4-D: Apply during rosette to early bolting stage.

Chlorsulfuron: Apply during rosette to early bolting stage.

Metsulfuron: Apply during rosette to early bolting stage.

Picloram + 2,4-D: Apply during rosette to early bolting stage.

Glossary

Adventitious: Tissue that is not growing at the typical location on the plant.

Annual: A plant completing its lifecycle within a single growing season.

Apex: The tip of a leaf, root, or stem.

Biennial: Herbaceous plant that completes its life cycle in two years: in the first year, plants germinate and typically exist as basal rosettes; in the second year, plants bolt, flower, and die.

Bolting: Producing erect, elongated flowering stems from a basal rosette of leaves. Usually associated with winter annuals or biennials.

Bracts: A very reduced leaf-like structure usually associated with the base of a flower or inflorescence.

Inflorescence: The flowering part of a plant.

Midrib: Central vein of a leaf.

Perennial: A plant that lives through several growing seasons (more than two years).

Restricted-Use Pesticide: Use of pesticide requires a certified applicator's license from the Colorado Department of Agriculture.

Rhizome: An underground, horizontal stem capable of producing shoots above ground and roots below ground. A plant with rhizomes is often referred to as **rhizomatous** or a **creeping perennial**.

Rosette: A circular cluster of leaves arising from a very short stem at the surface of the soil. Lacks an erect stem.

Sepal: A flower part that usually encloses and protects the flower bud.

Spur: A tubular projection from a flower.

Taproot: A prominent root with few branches, sometimes swollen to store nutrients.

Viable: Capable of germination.

Whorl: More than two leaves or flowers attached at a node.

Listings are informational only, not an endorsement by El Paso County.
Application of restricted chemicals requires a certified professional.

Herbicide Vendors

Big R
165 Fontaine Blvd.
Colorado Springs, CO 80911
(719) 390-9130

5845 Constitution Ave
Colorado Springs, CO 80915
(719) 591-1830

14155 E. Highway 24
Peyton, CO 80831
(719) 749-9136

840 Spanish Bit Drive
Monument, CO 80921
(719) 488-0000

Herbicide Applicators

A Green Image (719) 243-0773

Colorado Stoneworks Landscaping (719) 538-6016

Colorado Vegetation Management, Inc. (719) 545-6163

Falcon Weed Control (719) 749-2551

Horizon Vegetation Management (303) 419-5332

OutWest Weed Control (719) 492-0166

Rocky Mtn. Weed Management LLC (719) 492-8515

Timberline Landscaping (719) 638-1000

Biological Control

Colorado Department of Agriculture Insectary
750 37.8 Road
Palisade, CO 81526
(866) 324-2963
https://ag.colorado.gov/conservation/palisade-insectary

Contacts

El Paso County
Parks and Community Services Department
Environmental Division
3255 Akers Drive
Colorado Springs, CO 80922-1503
EVSnoxiousweeds@elpasoco.com
https://communityservices.elpasoco.com/environmental-division/

Colorado Department of Agriculture
Conservation Services Division
Noxious Weed Program
305 Interlocken Parkway
Broomfield, CO 80021
https://ag.colorado.gov/conservation/noxious-weeds

Colorado State Forest Service
Woodland Park District
113 South Boundary Street
Woodland Park, CO 80863
Phone: (719) 687-2951, (719) 687-2921
https://csfs.colostate.edu/woodland-park/

Colorado State University Extension Office
17 N. Spruce Street
Colorado Springs, CO 80905
Phone: (719) 520-7690
http://elpaso.extension.colostate.edu/

Colorado Weed Management Association
7187 W 79th Drive
Arvada, CO 80003
(303) 210-7077
www.cwma.org

Natural Resources Conservation Service
www.nrcs.usda.gov
Colorado Springs Service Center
5610 Industrial Place, Suite 100
Colorado Springs, CO 80916
(719) 632-9598

Simla Service Center
PO Box 188
504 Washington Street
Simla, CO 80835
(719) 541-2358

Appendix C
USDA Technical Note for Convolvulus arvensis
Colorado State University Fact Sheet

United States Department of Agriculture
NATURAL RESOURCES CONSERVATION SERVICE
Invasive Species Technical Note No. MT-9
February 2007

Ecology and Management of field bindweed [*Convolvulus arvensis* L.]

by

Jim Jacobs, NRCS Invasive Species Specialist, Bozeman, Montana

Figure 1. Field bindweed forms mats of trailing, twining vines.

Abstract

Field bindweed is a persistent perennial weed in the Convolvulaceae taxonomic family found on cultivated fields, orchards, plantations, pastures, lawns, gardens, roadsides and along railways. It is listed as one of the ten most serious weed problems worldwide. Its extensive, competitive root system is capable of vegetative reproduction. This combined with long-lived seeds makes it difficult to manage. Dense tangled mats formed from the trailing vines, and vines climbing on crops, reduce crop yields and increase production costs. Over 500 seeds per plant can be produced from the funnel-shaped flowers.

Field bindweed is native to the Mediterranean region and was first recorded in the United States in 1739. In Montana, it was first collected in 1891 from Missoula County near the University of Montana, and by 2001 it had been reported from all Montana Counties except Richland and Fallon (http://invader.dbs.umt.edu). Propagules of field bindweed migrate as contaminants of crop seed and hay, when attached to farming equipment, and they have been intentionally introduced as ornamental or medicinal plants.

Once established, field bindweed will persist after most control applications. However, the leaves are not shade tolerant and competitive plants will suppress field bindweed and reduce its seed production. On croplands, frequent cultivations will reduce root reserves; however infestations can increase under no-till or reduced till management. Cultivation combined with application of 2, 4-D, glyphosate, or their combination will reduce field bindweed without injury to crops. Dicamba, glyphosate, picloram, quinclorac and 2, 4-D will provide short-term

suppression of field bindweed. The gall mite, *Aceria malherbae,* stunts field bindweed growth and reduces seed production.

Biology and Identification

There are over 84 names for field bindweed. The ancient Greek name translates to "circling plant" and the name given by the Romans means literally "a large worm that wraps itself in vines." Byndweede was the name applied in England in the 1500s. Other names include creeping Jenny, European bindweed, small-flowered morning-glory, wild morning-glory, devil's guts, hedge bells, corn lilly, withwind, bellbind, laplove, and the Spanish called it chicken guts. The scientific binomial, *Convolvulus arvensis* designated by Linnaeus in 1753, is the combination of a Latin verb "to roll together" or "to entwine" with Latin for "of the field." Inter-specific hybrids in field bindweed have not been reported.

Roots. Field bindweed produces an extensive system of roots and rhizomes whitish in color, cordlike, and fleshy. The primary root forms a taproot that can penetrate the soil to depths of two to ten feet (0.5-3 m). Lateral roots grow from buds along the taproot and from adventitious buds at the stem base. Buds along the lateral roots give rise to rhizomes in early spring, and when rhizomes reach the soil surface, they establish new crowns capable of generating independent plants. Rapid growth of rhizomes begins when day temperatures approach 60° F (14° C) and night temperatures do not drop below 35° F (2° C). Rhizomes are found in the upper two feet (60 cm) of the soil profile. The entire root system of one plant can occupy an area 20 feet (6 m) in diameter and 30 feet (9 m) in depth. Roots accumulate starch to a maximum in August and September after which the starch rapidly converts to sugar and by October the amount of sugar in the roots is greatest. The sugar acts as antifreeze to protect roots from freezing injury over winter. Root carbohydrate reserves are lowest in May commensurate with stem elongation. Root nitrogen content is greatest in mid-April prior to shoot emergence and lowest in mid-May. Research has shown that once hardened in the autumn, roots and rhizomes survive temperatures as low as 21° F (-6° C) but when located in the upper soil profile are injured when the ground freezes. One study found roots were killed when exposed to 18° F (-8° C) or lower and root injury is common in frozen ground.

Stems. The stems of field bindweed are slender vines that run along the ground or climb any available object. Stem length ranges from one to six feet (0.3-1.8 m), they often twine, form dense, tangled mats, and they are normally hairless but can be pubescent. The stem surface is corrugated longitudinally with a thick cuticle. Freezing temperatures kill stems back to the root crown. Stems emerge from root crowns in early May. Rapid stem growth begins when day temperatures approach 60° F (14° C) and night temperatures do not drop below 35° F (2° C).

Leaves. The leaves of field bindweed vary in shape and size but are generally described as arrowhead- or spade-shaped because of the hastate lobes at the leaf base, distinguishing it from closely related morning glory species (see Figure 2). Their length ranges from three-quarters to two inches (2-5 cm) and the margins are entire. A petiole attaches them to the stem in an alternate arrangement. Field bindweed leaves are similar to those of wild buckwheat (*Polygonum convolvulus*), however wild buckwheat is an annual, its flowers are green, leaves are heart-shaped and the leaf petiole bases have stipules that sheath the stem.

Figure 2. The leaves of field bindweed are arrowhead-or spade-shaped and grow from the leaf axils on long pedicels.

Flowers. Field bindweed flowers have been described as funnel-, trumpet-, and bell-shaped because the five petals are completely fused together. The lobes are nearly indistinguishable and form a corolla tube that gradually widens upward and flares outward at the edge (see Figure 3). The length of the floral tube ranges from one-half to one inch (1.5-2.5 cm) long, it is three-quarters to one inch in diameter, and it is white or pinkish-purple. The relatively small flower distinguishes field bindweed from other species in the morning glory family. The five sepals subtending the funnel-form corolla are also fused, one- to two-tenths of an inch (3-5 mm) long, and greenish with pink margins. Five stamens are unequal in length and attached to the corolla alternate to the lobes and near the base. The pistil has one style, one two-chambered ovary each producing one or two seeds. The fruit is a capsule. The flowers are single or sometimes in pairs on a long peduncle that grows from the leaf axils. Most flowers have two green, linear bracts less than two-tenths of an inch (4 mm) long on the peduncle about one inch (2.5 cm) below the flower. The size of the bracts and the size and color of the flower can distinguish field bindweed from other morning glory species. Flowering begins in late June and continues into the fall as long as conditions are favorable. An individual flower persists for one day only, beginning expansion in early morning, also when nectar production begins. Flowers are self-incompatible and pollinated by bees in the Halictidae family (Hymenoptera), honeybees, bumblebees, butterflies and moths that are attracted by the nectar.

Figure 3. The flowers of field bindweed are funnel-form.

Seeds. Field bindweed seeds are ovoid, pear-shaped, one- to two-tenths of an inch (3-5 mm) long, three-sided with normally one-side rounded and two-sides flattened, but variable depending on environmental conditions. Seed weight is about ten mg. They have hard, impermeable, dull brownish-grey and coarsely-roughened seed coats. Seed set is greatest in dry, sunny weather and dry-calcareous soils and may fail on heavy, poorly-drained soils and during rainy periods. Seeds can germinate ten to 15 days after pollination when seed moisture content is 80 percent. Impermeability of the seeds to water sets in by 23 to 25 days after pollination. Fresh seeds are 87-99 percent viable, 5-25 percent can germinate, and 60-80 percent has enforced dormancy by the impermeable seed coat. Dormancy can be broken by mechanical scarification or by treatment with concentrated sulfuric acid or ethyl alcohol. Over-wintering reduces impermeability by 30 percent. Peak germinate is in late spring or early summer, however seeds will germinate throughout the growing season if moisture is adequate. Seeds in the soil can remain viable for 20 years or more, and one study found 62 percent of seeds were viable after stored at room temperature for 50 years.

Spread. Field bindweed spreads predominantly by seeds that generally fall near the parent plant. The hard impermeable seed coat enables seeds to remain viable in the stomachs of migrating animals for up to 144 hours, and thus animal and bird migration facilitates long distance dispersal. Seeds also disperse in water. Field bindweed commonly spreads long distances through human transport as seed in flower packets and as a contaminant of crop seed. Farm equipment spreads root and rhizome fragments within and between fields. Field bindweed has been intentionally introduced into the United States as wild morning glory for ornamental plantings, as ground cover and in hanging baskets.

Habitat. Field bindweed grows on cultivated fields, pastures, gardens and lawns, roadsides and railways and in waste places. It can survive long periods of drought. It favors rich fertile soils that are dry or moderately moist, but it can persist on poor, gravely soils. It is found in temperate, tropical, and Mediterranean climates throughout the world but it is most problematic in temperate region croplands. Its distribution extends from 60° N to 45° S latitude and it has been reported at 10,000 feet (3,048 m) elevation in the Himalaya Mountains.

Economic Impacts. The extensive root system of field bindweed enables it to effectively compete for soil moisture and nutrients resulting in reduced crop yield. In Spain, the economic

injury threshold in a winter wheat/sunflower crop rotation was estimated at 14 plants per square yard (square meter). The twining stems cause lodging of crops and interfere with crop harvest. Crop seed contamination with field bindweed seed reduces crop value and increases seed cleaning costs. In lawns and gardens, field bindweed increases maintenance costs and reduces the aesthetic value of ornamentals. As an alternate host of the viruses that cause potato X disease, tobacco streak, tomato spotted wilt, and vaccinium false bottom, field bindweed contributes to losses associated with these crop diseases.

Field bindweed is a good fodder plant. Cattle, sheep and goats eat it; however, the alkaloid pseudotropine in field bindweed was reported to cause equine intestinal fibrosis. In India, the root is used as a purgative. It has been used to stop bleeding, as a laxative, a gynecological aid, to stimulate bile flow, and as a medicine for spider bites. The Okanagan-Colville people of British Columbia and Washington fashioned the twining stems into rope. In one study, shoots of field bindweed accumulated more than 3,800 mg chromium, 1,500 mg cadmium, and 560 mg of copper per kilogram of dry tissue and may be a suitable plant for phytoremediation of soils contaminated with heavy metals.

Management Alternatives

Tilling. Frequent cultivations reduce field bindweed root reserves and deplete the soil seed bank. To be effective, fields should be tilled eight to 12 days after re-growth for three to five years. Tilling at the bloom stage when root carbohydrate and nitrogen reserves are lowest may be the most effective timing for suppression. A chisel plow encourages re-growth of field bindweed. After re-growth, using a sweep plow removes top growth and leaves plant residue on the soil surface. Early emerging and fast growing crops will shade field bindweed and reduce its re-growth after tilling. Field bindweed increases under reduced tillage or no-till management that does not include herbicidal or other control methods. Re-vegetation as soon as practical after tilling helps suppress field bindweed re-establishment. If a field is severely infested it is recommended that a cover crop or cereal grain be planted and labeled herbicides applied for at least one growing season.

Herbicide.[1/] Herbicides temporarily suppress field bindweed. The effectiveness of herbicides will be reduced under drought conditions. The wax surface of field bindweed leaves grown under high light and low humidity conditions is three times greater than leaves of plants grown under low light and high humidity conditions. Field bindweed leaves grown under high light/low humidity conditions absorbed nine percent of applied glyphosate compared to 21 percent absorbed by leaves grown under low light/high humidity conditions. Bio-types of field bindweed have different tolerances to herbicides. No herbicide or herbicide combination will provide 100 percent control.

Glyphosate applied pre-crop emergence at four to five quarts of a three pound acid equivalent per gallon formulation will reduce field bindweed during the growing season. The addition of ammonium sulfate at two percent by weight will counteract the antagonistic effect of hard water and cations secreted by the plant on the leaf surface and improve penetration of the leaf surface by the herbicide. Dust covered leaves will reduce the effectiveness of glyphosate. Combining glyphosate with 2, 4-D or dicamba increases the absorption and accumulation of glyphosate in field bindweed roots. Glyphosate will not injure crops when applied pre-emergence, however it will injure or kill established crops and desirable plants when they are actively growing.

The ester and amine formulations of 2, 4-D applied at one pint per acre of a four pound per gallon formulation at the tillering stage of cereal crops suppresses field bindweed during the crop season. Applied at one or two quarts per acre in the fall is most effective when the soil is moist and field bindweed stems are 12 inches long. The ester formulation gives more effective control compared to the amine formulation; however crops may be susceptible to injury from volatile drift of the ester.

Fall application of dicamba at one to two quarts per acre controls field bindweed better than 2, 4-D when applied in the fall. However, crop injury from these rates of dicamba has been reported and dicamba is more expensive than 2, 4-D. Dicamba is appropriate for spot treatment and on pastures and rangeland.

Picloram applied at one quart per acre, and combinations of picloram plus glyphosate, 2, 4-D or dicamba controls field bindweed for one or more years. The long residual activity of picloram in the soil limits crops that can be planted after its application for one or more years. Picloram can be used on pastures, rangeland, and in wheat. In a wheat-fallow rotation field heavily infested with field bindweed, picloram (1 pint/acre) plus 2, 4-D (1 pound/acre) was applied in September post-harvest, and 2, 4-D (1 pound/acre) was applied in September of the fallow year. This management was repeated for four years. Field bindweed control was 80, 41, 79, and 91 percent in the summers following the herbicide applications. Wheat yields were two and four times greater under this management than where no herbicide was sprayed in the harvest years (two seasons after picloram was sprayed).

Quinclorac applied at 3.0 to 5.3 ounces/acre in the fall before the first killing frost controls field bindweed. It must be applied with 0.5 percent by volume methylated seed oil (MSO), and the addition of 28 percent urea ammonium nitrate or ammonium sulfate can improve control. Field bindweed should be actively growing, at least four inches long, and not drought stressed. In one study, quinclorac was applied at one quarter pound (four ounces) per acre in combination with one pound per acre 2, 4-D and MSO at 0.5 percent by volume in September post wheat harvest in a wheat/fallow crop system. In the fallow year, quinclorac was applied at two ounces/acre with the 2, 4-D and MSO. In the third year Quinclorac was applied at two ounces/acre and 2, 4-D was applied at one-half pound per acre, and in the fourth year only 2, 4-D was applied at one pound per acre. Field bindweed was controlled each year by 65, 41, 79, and 92 percent, respectively, compared to the no herbicide treatment. Wheat yields were more than two and four times greater compared to the no herbicide treatment. In a separate study, imazapyr applied at one-tenth, one-quarter, and one-half pound per acre reduced field bindweed by 67, 74, and 96 percent respectively, however severe crop injury can be expected from these rates.

[1/] Any mention of products in this publication does not constitute a recommendation by the NRCS. It is a violation of Federal law to use herbicides in a manner inconsistent with their labeling.

Grazing and Mowing. Cattle, sheep and goats will graze on field bindweed leaves and stems. Hogs and chickens eat leaves, stems, exposed roots and rhizomes, and crowns. Mowing will not reduce infestations of field bindweed, but it may reduce seed production if timed to prevent flowering, and mowing can be used to spread the biological control mite *Aceria malherbae*.

Biological Control. Two biological control agents attack field bindweed: *Aceria malherbae* (initially reported as *A. convolvuli*, now considered a separate species) and *Tyta luctuosa*. *Aceria*

malherbae is the bindweed gall mite native from central and southern Europe to northern Africa. It has multiple generations per year and over-winters as an adult or nymph on the root buds. The soft-bodied adults are minute and difficult to see without magnification, are worm-like with ring-like body segments and two pairs of legs on the combined head and thorax. The nymphs resemble the adults in appearance except they lack external genitalia. Adults and nymphs are both destructive to field bindweed. When *A. malherbae* attack field bindweed, galls are formed on the actively growing leaves, petioles, and stem tips. Leaves with galls fold or twist upward along the mid-rib. Attacked stem buds fail to elongate and form compact clusters of stunted leaves. *Aceria malherbae* can be collected throughout the growing season as adults or nymphs by handpicking stems with galls and wrapping them around actively growing field bindweed stem tips in other infestations. Spring or early summer releases give mites more time to increase populations than later releases. Mites can also be spread by mowing sites that have established galls. The mite may be difficult to establish where fields are cultivated or sprayed with herbicides, unless herbicides are applied at sub-lethal doses. This mite also attacks species in the *Calystegia* genus (also Convolvulaceae) which includes hedge bindweed and native species that are listed as rare and endangered. However non-target impacts have not been reported.

Tyta luctuosa is the bindweed moth native to Europe north to southern Scandinavia, Asia east to Turkistan, and south into India, and Northern Africa. It over-winters as adults and larvae on the root buds of field bindweed. The caterpillar-like larvae are the destructive stage and feed at night on the flowers and leaves and on litter during the day from May to September. Damage to field bindweed has not been quantified. First generation adult moths emerge in May and are active until June, and second generation moths are active from July to September. This moth also feeds on *Calystegia* (other bindweed) species but no effects have been reported. As of 2002, numerous releases in the United States have not successfully established and availability of the insect is limited because of failures during mass rearing.

Table 1. Biological control agent for management of field bindweed, the site of attack on the plant, insect life stage and plant life stage for collection, and the collection method for re-distribution.

Agent	Type	Site of Attack	Collection	Collection Method
Aceria malherbae	mite	leaves and stems	larval	handpick
Tyta luctuosa	moth	flowers and leaves	larval and adult	handpick and lights

Re-vegetation. Field bindweed is most prolific when growing in full sunlight and is suppressed by plants that are active early in the spring and form a shading canopy. In hazelnut orchards, a cover crop of ryegrass (*Lolium multiflorum*), hairy vetch (*Vicia villosa*) and red clover (*Trifolium pratense*) reduced the density and biomass of field bindweed compared to no cover crop (bare ground). Cover crop residues also suppressed field bindweed. Winter wheat, other crops, and perennial forages with early spring growth will shade and suppress field bindweed. Establishing competitive perennial grasses on disturbed land, followed by prescribed grazing management to maintain grass vigor will suppress field bindweed and prevent spread by seed. Refer to Montana Plant Materials Technical Note 46, 'Seeding Rates and Recommended Cultivars,' and Extension Bulletin EB19 'Dryland Pasture Species for Montana and Wyoming' for seeding rate guidance and re-vegetation species selection. State and area resource specialists can help determine the most appropriate, site-specific species mix, timing of seeding, and seeding methods. Where herbicides have been applied, chemical carryover should be assessed prior to planting permanent vegetation.

Integrated Pest Management

Integrated pest management is the application of two or more management alternatives so they are complimentary in weed suppression and improve production or conservation of resources. The most effective field bindweed control programs in croplands combine tillage and crop rotation with herbicide management. On pasture and rangeland, prescribed grazing management to maintain competitive grasses combined with herbicide management and/or *A. malherbae* may be more effective than any of the treatments applied alone. In mixed grass and legume pastures, the best control is through maintaining a resilient healthy stand through proper grazing management and crop rotation when stands thin and provide open space for weed invasion.

There are many systems used to time the application of multiple control procedures, one of which is based on the economic injury threshold. In weed management, the economic injury threshold is the density of the weed at which there will be crop loss greater than the cost of control if no management action (generally herbicide) is taken. Under no-till management in a wheat/sunflower crop rotation in southern Spain, the economic injury threshold for field bindweed was determined to be 14 stems/m^2. Field bindweed tended to form stable patches in no-till management. In the study, weed density was sampled in May before crop harvest. Maps estimating field bindweed density from samples were used to estimate areas where densities would exceed the economic injury threshold density and where post-emergence herbicides should be applied. Field bindweed densities were greater (and more variable) in wheat than sunflower, and therefore the sunflower rotation reduced the total field area exceeding the economic injury threshold. The study predicted applying post-emergence herbicides only where the economic injury threshold was exceeded reduced herbicide costs by 81 percent during the sunflower rotation.

In a laboratory study, the biological control mite *A. malherbae* and low rates of 2, 4-D or glyphosate were combined on field bindweed. Shoot and root biomass of field bindweed were reduced by 2, 4-D applied at one-tenth pound per acre and there was no reduction of galls formed by mites. Similarly, glyphosate applied at one-quarter pound per acre reduced field bindweed shoot and root weight, however there were two times more *A. malherbae* on glyphosate treated plants than non-sprayed plants. Reduced rates of these herbicides can be used post-crop-emergence to suppress field bindweed with lower risk to crop injury and without reducing populations of *A. malherbae*. On non-crop land, combining *A. malherbae* with mowing management can be used to manage field bindweed and facilitate the spread of *A. malherbae*.

References

Boydston, R.A. and M.M. Williams, II. 2004. Combined effects of *Aceria malherbae* and herbicides on field bindweed (*Convolvulus arvensis*) growth. Weed Science 52:297-301.

Enloe, S.F., P. Westra, S.J. Nissen, S.D. Miller, and P.W. Stahlman. 1999. Use of quinclorac plus 2, 4-D for controlling field bindweed (*Convolvulus arvensis*) in Fallow. Weed Technology. 13:731-736.

Jurado-Expósito, M., F. López-Granados, J.L. González-Andújar, L. García-Torres. 2004. Spatial and temporal analysis of *Convolvulus arvensis* L. populations over four growing seasons. European Journal of Agronomy. 21:287-296.

Littlefield, J.L. 2004. Bindweeds. pp. 150-157. *In* Coombs, E.M., Clark, J.K., Piper, G.L., Cofrancesco, Jr., A.F. (Eds.) Biological Control of Invasive Plants in the United States. Oregon State University Press, Corvallis, Oregon.

Schoenhals, M.G., A.F. Wiese, and M.L. Wood. 1990. Field bindweed (*Convolvulus arvensis*) control with imazapyr. Weed Technology 4:771-775.

Weaver, S.E. and R.R. Walker. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62:461-472.

Westra, P., P. Chapman, P.W. Stahlman, S.D. Miller, and P.K. Fay. 1992. Field bindweed (*Convolvulus arvensis*) control with various herbicides combinations. Weed technology 6:949-955.

Canada Thistle Identification and Management

List B

Canada thistle (*Cirsium arvense*) is a non-native, deep-rooted perennial that spreads by seeds and aggressive creeping, horizontal roots called rhizomes. Canada thistle can grow 2 to 4 feet in height. The leaves are oblong, spiny, bright green, and slightly hairy on the undersurface. Unlike other noxious biennial thistles which have a solitary flower at the end of each stem, Canada thistle flowers occur in small clusters of 1 to 5 flowers. They are about 1 cm in diameter, tubular shaped, and vary from white to purple in color.

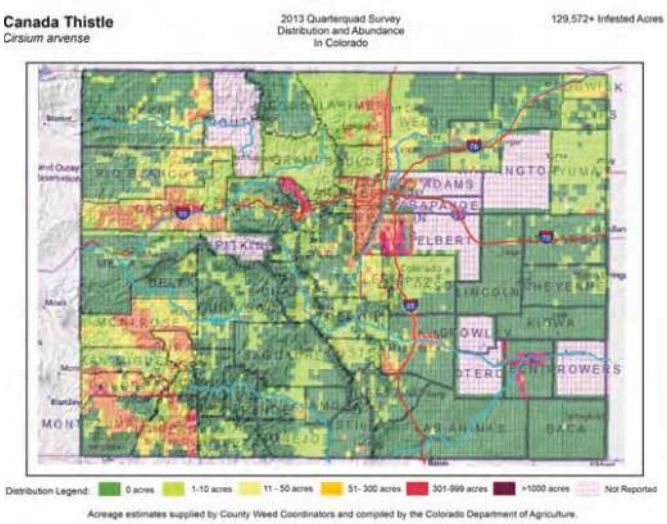
Canada thistle emerges from its root system from late April through May. It flowers in late spring and throughout the summer. It produces about 1,000 to 1,500 seeds per plant that can be wind dispersed. Seeds survive in the soil for up to 20 years. Additionally, Canada thistle reproduces vegetatively through its root system, and quickly form dense stands. Each fragmented piece of root, 0.25 inch or larger, is capable of forming new plants. The key to controlling Canada thistle is to eliminate seed production and to reduce the plant's nutrient reserves in its root system through persistent, long-term management.

Canada thistle is one of the most troublesome noxious weeds in the U.S. It can infest diverse land types, ranging from roadsides, ditch banks, riparian zones, meadows, pastures, irrigated cropland, to the most productive dryland cropland. Large infestations significantly reduce crop and cattle forage production and native plant species. It is a host plant to several agricultural pests and diseases. Canada thistle prefers moist soils, but it can be found in a variety of soil types. It has been found at elevations up to 12,000 feet.

Effective Canada thistle control requires a combination of methods. Prevention is the most important strategy. Maintain healthy pastures and rangelands, and continually monitor your property for new infestations. Established plants need to be continually stressed. Management options become limited once plants begin to produce seeds. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Canada thistle is designated as a "List B" species as described in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, (303) 869-9030.

2013 Quarter Quad Survey



Key ID Points

1. Cluster of 1-5 white to purple flowers on a stem.
2. Floral bracts are spineless.
3. Small flowers that are 1 cm in diameter.
4. Perennial, rhizomatous plant with spiny, oblong, green leaves.

Canada thistle

Cirsium arvense

List B

Canada thistle

Cirsium arvense

Integrated Weed Management Recommendations

Integrated weed management is imperative for effective Canada thistle control. This weed needs to be continually stressed, forcing it to exhaust root nutrient stores, and eventually die. Mowing or grazing can be followed up with herbicide application. Avoid hand-pulling and tilling which can stimulate the growth of new plants.

CULTURAL

Prevention is the best control strategy. Maintain healthy pastures , riparian areas, and rangelands. Prevent bare ground caused by overgrazing, and continually monitor your property for new infestations. Establishment of select grasses can be an effective control.

BIOLOGICAL

Cattle, goats, and sheep will graze on Canada thistle when plants are young and succulent in the spring. Follow up grazing with a fall herbicide application. Insects are available, and provide limited control. Currently, collection and distribution methods for Canada thistle rust (*Puccinia punctiformis*) are being refined. For more information on Canada thistle biocontrol, contact the Colorado Department of Agriculture - Palisade Insectary at (970) 464-7916.

MECHANICAL

Due to Canada thistle's extensive root system, hand-pulling and tilling create root fragments and stimulate the growth of new plants. Mowing can be effective if done every 10 to 21 days throughout the growing season. Combining mowing with herbicides will further enhance Canada thistle control.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to rangeland and some pastures. Treatments may be necessary for an additional 1 to 3 years because of root nutrient stores. Always read, understand, and follow the label directions.

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	5-7 oz. product/acre + 0.25% v/v non-ionic surfactant OR 1 teaspoon product/gal water + 0.32 oz./gal water	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth. Can also add chlorsulfuron (Telar) at 1 oz./acre to the mix.
Clopyralid + Triclopyr (Prescott; Redeem; others)	3 pints product/acre + 0.25% v/v non-ionic surfactant OR 1.25 oz. product/gal water + 0.32 oz./gal water	Apply until flowering and/or fall regrowth.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	5.5 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply to spring rosette to flower bud growth stage; or fall. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Note: *Product not permitted for use in the San Luis Valley.		
Additional herbicide recommendations for this and other species can be found at: **goo.gl/TvWnv9**		

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Updated:
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