This booklet is a collaborative effort

Grand County
Colorado

970-887-0745

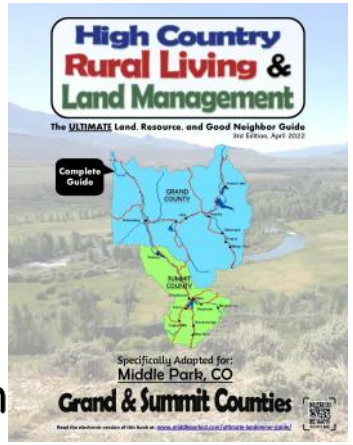
Middle Park Conservation District

970-724-3456

For information on other Natural Resources related topics and Mountain Living, check out Middle Park Conservation District's **High Country Rural Living and Land Management** guide.

www.middleparkcd.com/ultimate-landowner-guide/

SCAN ME



Noxious Weed Management

Guide

Grand County, CO

About This Guide

The purpose of this guide is to provide information to the citizens and land managers of Grand County, Colorado, who are interested in noxious weed management. The goal is to increase awareness of noxious weeds, emphasize the importance of proper identification and management of noxious weeds, and provide means of control for local noxious weed species based on local, state, and national research-based information.

For more detailed information on specific *noxious weeds*, contact

Grand County Division of Natural Resources
469 E. Topaz
P.O. Box 9
Granby, CO 80446
Ph: 970-887-0745
www.co.grand.co.us/140/Noxious-Weeds

For more detailed information on *reseeding/revegetating*, contact

Middle Park Conservation District & NRCS
106 S. 2nd Street
P.O. Box 265
Kremmling, CO 80459
Ph: 970-724-3456
www.middleparkcd.com

For more detailed information on *small acreage management and smart gardening practices,* contact

Colorado State University Extension
210 11th Street
P.O. Box 475
Kremmling, CO 80459
Ph: 970-724-3436
www.grandcountyext.colostate.edu

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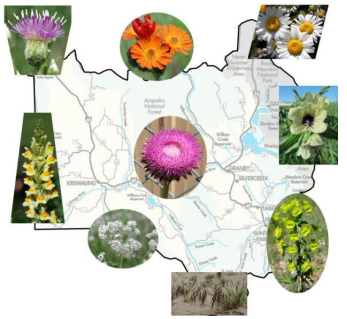
Thank you to everyone who contributed to the success of this publication!!!



Revised: September 2022

What are Noxious Weeds & Why Should You Care?

Noxious weeds, as defined in the Colorado Noxious Weed Act, are non native "alien" plants that aggressively invade; are detrimental to economic crops or native plant communities; are poisonous to livestock; are carriers of detrimental insects, diseases or parasites; or have direct or indirect effects that are detrimental to the environmentally sound management of a natural or agricultural ecosystem.

You should care about noxious weeds because they are a threat to Colorado's natural resources. Thousands of acres of cropland, rangeland, wildlife habitat and native plant communities are being destroyed by noxious weeds every single year.

Colorado Noxious Weed Act

The Colorado Department of Agriculture has been enforcing noxious weed control since 1990, but the most recent revision of the Colorado Noxious Weed Act came in 2004.

The act specifically states, ***"It is the duty of ALL persons to use integrated methods to manage noxious weeds if the same are likely to be materially damaging to the land of neighboring landowners."***

The Colorado Noxious Weed Act also laid the foundation for the formation of county and municipality noxious weed plans in order to organize a statewide, coordinated effort to stop the spread of noxious weeds in Colorado.

Read the Colorado Noxious Weed Act in its entirety at
http://www.100thmeridian.org/laws/pdfs/Colorado%20Noxious%20Weed%20act.pdf

Noxious Weed Designation

Noxious weeds are designated in one of three lists under the Colorado Noxious Weed act according to their statewide distribution and level of required control.

"List A" species are rare in Colorado and are **SUBJECT TO ERADICATION WHEREVER DETECTED** statewide in order to protect neighboring lands and the state as a whole.

"List B" species have discrete statewide distributions that are **SUBJECT TO ERADICATION, CONTAINMENT, OR SUPPRESSION** in order to stop the continued spread of these species.

"List C" species are widespread and well-established noxious weeds for which **CONTROL IS RECOMMENDED BUT LEFT UP TO LOCAL AUTHORITY(IES) FOR FINAL DECISION.**

Grand County Noxious Weed Plan

Under the guidelines of Colorado Noxious Weed Act, the Board of County Commissioners for Grand County has developed the *"Grand County Noxious Weed Management Plan".* The plan designates the noxious weeds that pose a threat to the environment and economy of Grand County by reducing wildlife habitat, agricultural production, property value, and native plant populations unique to Grand County. The management plan also outlines means of control aimed at eradicating, reducing, suppressing or containing populations of noxious weeds. Finally, the Grand County Noxious Weed Management Plan specifies Landowner Responsibility and Enforcement per the procedures detailed in Colorado Noxious Weed Act (CRS§35-5.5-110).

Read the Grand County Noxious Weed Management Plan at
http://co.grand.co.us/DocumentCenter/View/75

Noxious Weeds Known in Grand County

List "A" Species

List "B" Species

List "C" Species

Weed descriptions on the following pages come from *Noxious Weeds of Colorado, 12th edition,* by the Colorado Noxious Weed Management Association.

Glossary of Terms

Annual: A plant which completes its life cycle in one season, spring through fall.

Biennial: Plants that require 2 seasons to complete life cycle. They typically germinate in late summer of year one, then over-winter, flower, and set seed by mid-summer of the following year.

Perennial: Plants that live 3 or more years.

Bract: A small structure below the flower; can be leaf-like or spiny

Pappus: The "parachute" of a seed.

Rhizome: An underground stem, usually lateral, sending out shoots above ground and roots below ground. The photo on page 12 of Canada thistle roots depicts rhizomes.

Taproot: One large, central root from which other roots sprout laterally. A carrot is an example of a taproot

Fibrous Roots: Many small, thin roots of similar size. Most grass roots are fibrous roots.

Icons for Possible Management Methods


Herbicide


Biological


Pulling


Grazing


Mowing

Google Images

Orange Hawkweed
List A
Eradicate

- **Growth Form:** Perennial
- **Height:** 1-2’
- **Reproduction:** seed; rhizomes; above ground roots (stolons)

- **Flowers:** bright reddish-orange; dandelion-shaped; 0.5-0.75” wide; groups of 5-30; petals notched at tip; bracts have dark hairs; June-August
- **Seed**: with pappus; 100-1000 per plant; viable for 7 years
- **Leaves:** basal; dark green; hairy
- **Stem:** fine dark hairs; no leaves
- **Roots:** fibrous; stolons; rhizomes
- **Other:** Has a milky sap. Can be confused with native Orange agoseris, but agoseris is dull orange and has a single flower.

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	4-6 oz/ac	Rosette to bolting
2	2,4-D	2qt/ac	At rosette stage

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Cypress Spurge
List A
Eradicate

Cypress spurge is smaller than leafy spurge with thinner leaves that are more crowded. Cypress spurge typically blooms earlier than leafy spurge.

- **Growth Form:** Perennial
- **Height:** 18”
- **Reproduction:** seed & rhizomes
- **Flowers:** yellowish-green ; 1/2” wide; a pair of inconspicuous heart-shaped bracts at tip of main branch; May-August
- **Seed**: light gray; football-shaped

- **Leaves:** alternate; 1” long; 1/8” wide; dense
- **Stem:** branched near top
- **Roots:** 10’ deep taproot; 12’ long rhizomes

- **Other:** Milky latex is toxic to livestock and irritating to people

Option	HERBICIDE	RATE	TIMING
1	2,4-D + Dicamba	2 qt + 1 qt/ac	Best at Flowering
2	Quinclorac	16 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Sulfur Cinquefoil

List B
Eradicate

- **Growth Form:** perennial
- **Height:** 1-2’ tall
- **Reproduction:** seeds & root fragments

- **Flowers:** pale yellow, dark yellow center; 5 petals; multiple at end of stems; May-July
- **Seed**: numerous; comma-shaped; brownish-purple with net-like pattern of veins; flattened; 0.05” long, viable for 4+ yrs

- **Leaves:** alternate; palmately compound 5-7 toothed leaflets on each leaf; leaf stocks have perpendicular hairs; underside of leaf is green
- **Stem:** one or more stems arising from well -developed root stocks
- **Roots:** tap root and branching roots

Other: unpalatable to grazing animals. May be confused with native cinquefoil. However, native cinquefoil has a silvery-green back side of leaves, where the non-native is green. Also, the hair on the stem of the native lays flat against the stem and the non-native has hair that is stiff and perpendicular to the stem.

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	4-6 oz/ac	Pre-bud stage

Sources: *Noxious Weed Species ID, Noxious Weeds of Colorado,* & Google

Leafy Spurge

List B
Suppress the Spread

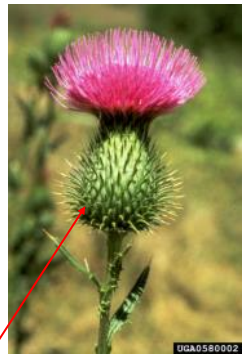
- **Growth Form:** Perennial
- **Height:** 1-3’
- **Reproduction:** seed & rhizomes
- **Flowers:** yellowish-green ; 1/2” wide; a pair of 1/2” wide heart-shaped bracts that look like petals; May-Aug depending on elevation
- **Seed**: seeds explode and project up to 15’ away; 350 seeds per plant that are viable for 5-8 yrs.
- **Leaves:** alternate; 1-2.5” long, 1/4” wide; blue-green in color; lance-shaped
- **Stem:** multiple; branched near end
- **Roots:** rhizomes; 17’ deep; 15’ long
- **Other:** Milky latex causes blisters in livestock and is irritating to people

Wear Gloves

Option	HERBICIDE	RATE	TIMING
1	Aminocyclopyrachlor	10-11 oz/ac	Best at Flowering
2	Aminopyralid (milestone) + Chlorsulfuron	7 oz + 1.5oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Bull Thistle
List B
Suppress the Spread



- **Growth Form:** Biennial, sometimes Annual
- **Height:** 18”-6’
- **Reproduction:** seed
- **Flowers:** dark purple to pinkish-purple with spiny bracts; 1.5-2” wide; 1-2” long; single flower at end of branch; July-September
- **Seed**: seeds with pappus; up to 4,000 per plant
- **Leaves:** alternate; 3-12” long; lance-shaped; clasping; tipped with spines; top side of leaf has small spines; bottom side has white hairs; small at top of plant
- **Stem:** highly branched; slightly hairy; spiny wings
- **Roots:** taproot 2’ long; lateral spreading roots from crown

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	3-5 oz/ac	Anytime before full flower
2	Chlorsulfuron	1 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Canada Thistle
List B
Suppress the Spread

- **Growth Form:** Perennial
- **Height:** 1-4’
- **Reproduction:** seed & rhizomes
- **Flowers:** white to purple; clusters of 1-5 at the end of stems; 0.5-0.75” wide; 1” long; July-October
- **Seed**: seeds with pappus; up to 5,000 per plant; viable for 20 yrs

Leaves: alternate; 0 .5-2.5” wide; to 7” long; lance-shaped; edges with spine-tipped lobes; top side dark green; bottom side lighter green.

- **Stem:** hollow; upper stem is smooth; lower stem covered with fine hairs.
- **Roots:** Rhizomatous and extensive; spreading up to 20 ft deep and 15 ft laterally

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	4-6 oz/ac	Anytime, but most effective when applied AFTER seed set

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Musk Thistle
List B
Suppress the Spread

- **Growth Form:** Biennial
- **Height:** 2-10’ tall
- **Reproduction:** seed only
- **Flowers:** purple; nodding when mature; 1.5-2” in diameter; <u>only one flower per stem</u> with prickly, pinecone-like bracts below the flower; June-September

- **Seed**: seed with pappus; 120,000 per plant; viable for 10 years
- **Leaves:** alternate; 10” long; 1-1.5” wide; dark green and deeply lobed; with spines on edges. Midrib and leaf margins may be whitish. **Rosettes 2-3’ wide with distinctive white midrib.**
- **Stem:** One to several stems from base; highly branched in upper portion of stem; spiny-winged
- **Roots:** taproot

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	At rosette to bud. If flowering, cut heads off and bag.
2	Chlorsulfuron	1 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Plumeless Thistle
List B
Eliminate

- **Growth Form:** Biennial or Annual
- **Height:** 1-6’ tall
- **Reproduction:** seed only
- **Flowers:** pink; red; or purple; rarely white. 1-2” wide; single at ends of branches or in clusters of 2-5; June-August
- **Seed**: **<u>without</u>** pappus; up to 9,000 per plant; viable for 10 yrs
- **Leaves:** Basal leaves are 4-8” wide; spiny lobes; stem leaves are alternate and blend in to stem; prominent midrib (like musk thistle)

- **Stem:** spiny wings that extend to flower head
- **Roots:** taproot
- **Other:** may hybridize with Musk thistle (page 13)

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	At rosette to bud. If in flower, cut heads off and bag.
2	Chlorsulfuron	1 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Scotch Thistle
List B
Eliminate

- **Growth Form:** Biennial
- **Height:** 18” - 10’
- **Reproduction:** seed only
- **Flowers:** violet to red; 1-2” wide; globe-shaped with spiny; needle-like bracts; 2-3 flowers at ends of branches; June-August

- **Seed**: small seeds with pappus; up to 40,000 per plant; viable for 20 yrs or more
- **Leaves:** alternate; bluish or greyish -green. Leaves are slightly hairy; toothed, with spines. Lower leaves are larger than upper leaves with lower leaves growing from 4-20” long, 6-8” wide. **Rosettes to 6’ wide.**
- **Stem:** broad spiny wings; up to 4” wide; entire plant is covered in fine hairs and can appear woolly.

- **Roots:** taproot stout and fleshy

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	At rosette to bud. If flowering, cut heads off and bag.
2	Chlorsulfuron	1 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Source: Reference #1

Thistle Identification Chart

Latin Name	Common Name	Origin	Flower Color	Leaves	Stems	Avg. Height	Growth Form
Carduus nutans	Musk thistle	Nonnative, noxious	Purple; single very large nodding flower at end of stem; purple bracts	Deeply lobed, dark green with light green or white midrib; spiny margins. No hairs	Spiny winged. No hairs	To 10 ft	Biennial
Onopordum acanthium	Scotch thistle	Nonnative, noxious	Purple; large upright globe-shaped flowerheads; bracts are spine-tipped	Toothed with slight lobe; attach directly to stem; hairy, giving grayish appearance to plant	Spiny winged, hairy	To 10 ft	Biennial
Cirsium arvense	Canada thistle	Nonnative, noxious	Light purple to white; multiple small flower heads in clusters on each stem	Whitish underside; spiny-tipped irregular lobes; attach directly to stem	Smooth with no spines; ridged	To 4 ft	Perennial
Cirsium vulgare	Bull thistle	Nonnative, noxious	Pink to purple; single flowers at ends of branches; spiny bracts	Tops of leaves with sharp spines; underside with prominently raised main veins and white hairs; tipped with spines; clasping	Spiny winged	To 6 ft	Biennial
Carduus acanthoides	Plumeless thistle	Nonnative, noxious	Pink, red, or purple; single or in clusters of 2-5 at end of branch	Basal leaves have spiny lobes; stem leaves blend into stem; leaves with prominent midrib (like musk thistle)	Spiny winged; extend to flower head	To 6 ft	Biennial or annual

Chamomile Daisy

List B

Suppress the Spread

- **Growth Form:** Annual or short-lived perennial
- **Height**: 6-30” tall
- **Reproduction:** seed
- **Flowers:** white with yellow center; 0.75-1.5” wide; single at end of branches; multiple flowers per plant; constantly flowering
- **Seed**: viable as soon as flower is formed; up to a million seed per plant; viable for up to 15 yrs
- **Leaves:** alternate; 1-2” long; ferny or feather-like; may have a disagreeable odor
- **Stem:** smooth; multiple
- **Roots:** fibrous
- **Other:** sometimes confused with pineapple weed

Noxious Noxious Non-Native, but not noxious

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Anytime. If flowering, use chlorsulfuron; be sure to spray flowers
2	Chlorsulfuron	1-3 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

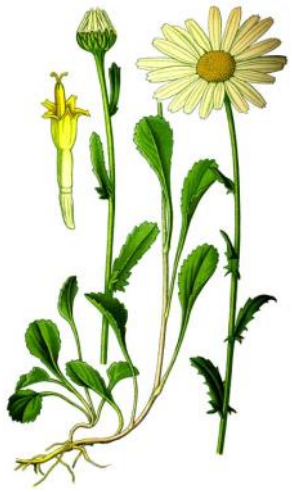
Oxeye Daisy

List B

Eliminate in areas West of Hot Sulphur by 2018. Only Suppression is required on Red Dirt Rd (GCR 19/USFS Rd 100) & East of Hot Sulphur Springs

- **Growth Form:** perennial
- **Height:** 10-24” tall
- **Reproduction:** seed and rhizomes
- **Flowers:** white with yellow center 1-2” wide; only one flower per plant and the end of stem; smell like wet dog; July-August

Seed: over 200 seeds per flower



- **Leaves:** alternate along stem; 1.5-5” long; 0.25-0.5” wide; lower leaves are spoon-shaped; upper leaves are narrow and clasp stem
- **Stem:** erect and hairless
- **Roots:** rhizomes
- **Other:** looks similar to the Shasta daisy; but Shasta daisy has larger flower and larger leaves (see page 17)

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Anytime; less effective at flower, but can treat AFTER flowering

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Dalmatian Toadflax

List B
Eliminate

- **Growth Form:** perennial
- **Height:** 1-3’ tall
- **Reproduction:** seed and rhizomes
- **Flowers:** snapdragon-like yellow flowers with orange throats; 0.75-1.5” long; double-lipped with long spur; July-August

- **Seed**: 500,000 per plant; viable for 10 yrs
- **Leaves:** alternate; 1” long; bluish cast; **very waxy**; dense; smooth; wrap around the stem
- **Stem:** thick and fleshy; multiple stems from one root crown; branched near top

- **Roots:** creeping rhizomes; 6’ deep and up to 12’laterally
- **Other:** may hybridize with yellow toadflax (page 20). May also be confused with native golden banner; but golden banner flowers in the spring (April-May).

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1.5 oz/ac	Anytime; less effective at flower

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Yellow Toadflax

List B
Suppression only in Williams Fork Valley.
Eliminate everywhere else.

- **Growth Form:** perennial
- **Height:** 1-2’ tall
- **Reproduction:** seed and rhizomes
- **Flowers:** yellow; 1” long; bearded orange throat and spur; similar to snapdragons; clusters of 15-20 at the end of the stem; July-August
- **Seed**: egg-shaped, double celled
- **Leaves:** alternate; dense; 2.5” long; 0.25” wide
- **Stem:** multiple stems from base**;** erect; 1-2’ long; simple and sparingly branched
- **Roots:** fibrous, creeping rhizomes; 3’ deep; more than 10’ laterally

- **Other:** may hybridize with Dalmatian toadflax (page 19). Young plants look similar to leafy spurge (page 10) prior to flowering, but yellow toadflax lacks the milky latex of leafy spurge.

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1.5 oz/ac	Anytime; Though it is less effective at flower

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Diffuse Knapweed
List B
Eliminate

- **Growth Form:** annual, biennial, or short -lived perennial
- **Height:** 1.5-3.5’ tall
- **Reproduction:** seed only
- **Flowers:** white; or sometimes lavender; 0.25” wide by 0.75” long; bracts with fringed edges and are spiny or pokey; June-September
- **Seed**: scaly pappus; 900-1,200 per plant; viable for 10 yrs
- **Leaves:** alternate; 1.25-3” long; 0.5-1.25” wide; finely divided; smaller and farther apart as you go higher on stem.
- **Rosettes: f**lat; finely-divided; silvery-green in color; 1-2” wide, 8” long
- **Stem:** stiff and branching from a single main stem
- **Roots:** taproot
- **Other:** may hybridize with spotted knapweed (page 22); plants may break off and become tumbleweeds later in the year

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Prior to flower. After flower, cut & bag.

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Spotted Knapweed
List B
Eliminate

- **Growth Form:** short-lived perennial or biennial
- **Height:** 1-3’ tall
- **Reproduction:** seed
- **Flowers:** pinkish-purple; 0.25-0.5” wide and 0.75-1” long; bracts are not spiny but have distinct veins and darkened spots. Usually a single flower at the end of branches; June-Sept
- **Seed**: with pappus; 0.125” long; 1,000 per plant; viable for 8 yrs
- **Leaves:** alternate; 0.75-1.5” long; greyish-green and divided
- **Stem:** upright; rigid; one or more branches
- **Roots:** stout taproot

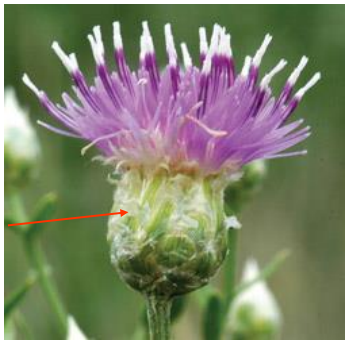
Tansyaster

- **Other:** differing from diffuse knapweed by bracts—spotted is not spiny or fringy and has dark tips. May be confused with native Tansyaster; but spotted knapweed does not have a yellow center.

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Anytime you see it

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Russian Knapweed
List B
Eliminate



- **Growth Form:** perennial
- **Height:** up to 3.5’ tall
- **Reproduction:** seed and rhizomes
- **Flowers:** pink to lavender; 0.25-0.5” wide; distinctive papery bracts below; June-August
- **Seed**: small; with pappus
- **Leaves:** alternate; lower leaves 1.5-4” long; upper leaves 0.25-1.25” long; lance-shaped ; smooth edges or toothed
- **Stem:** erect and branched
- **Roots:** vigorous; creeping rhizomes; black and scaly (which differentiates it from other knapweeds)
- **Other:** toxic to horses; very aggressive competitor

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Anytime

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Houndstongue
List B
Eliminate east of Highway 125; Suppress west of Highway 125

- **Growth Form:** biennial
- **Height:** 1-4’ tall
- **Reproduction:** seed
- **Flowers:** reddish-purple; 0.375” wide; 5-petaled; upper leaf axils in panicles; smell like buttered popcorn; June-September;
- **Seed**: single seed in nutlet; 4 per flower; velcro-like; 0.25” long; readily attach to clothing and animal fur; up to 2,000 per plant
- **Leaves:** alternate; 1-12” long; and 1-3” wide; oblong to lance-shaped rough and hairy; similar to a dogs tongue
- **Stem:** single; stout stem
- **Roots:** taproot up to 3’ deep
- **Other:** toxic to livestock. If pulling and seeds are present, bag and discard.

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1-2 oz/ac	Rosette to seeding

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Common Tansy
List B
Eliminate

- **Growth Form:** perennial
- **Height:** 1.5-6’ tall
- **Reproduction:** seed and rhizomes
- **Flowers:** 0.25-0.5” wide; numerous; button-like; no petals; flat-topped dense clusters; June-September
- **Seed**: short crown-shaped pappus
- **Leaves:** alternate; 1-6” wide; 2-12” long; deeply divided in narrow; toothed segments; strong smell when crushed
- **Stem:** often purplish in color; branched near the top
- **Roots:** woody rhizomes
- **Other:** poisonous to livestock and humans if ingested

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1-3 oz/ac	Anytime

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Dame’s Rocket
List B
Eliminate

- **Growth Form:** biennial or short lived perennial
- **Height:** up to 4’ tall
- **Reproduction:** seed
- **Flowers:** white or purple; 0.5-0.75” wide; 4-petaled; clustered at top of plant; June-September
- **Seed**: narrow seedpods to 1.5” long
- **Leaves:** alternate; 2-4” long; slightly hairy; lance-shaped ; finely toothed margins
- **Stem:** erect and slightly hairy
- **Roots:** fibrous and shallow
- **Other:** may produce flowers and seeds simultaneously. May look similar to native fireweed, but dame’s rocket flowers later than fireweed

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1 oz/ac	Anytime

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

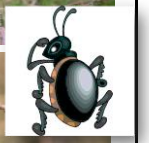
Black Henbane
List B
Eliminate

- **Growth Form:** annual or biennial
- **Height:** 6”-4’ tall; forms large clumps
- **Reproduction:** seed only
- **Flowers:** brownish-yellow with purple center; has veins that are funnel-shaped; one-sided; not showy; June-September
- **Seed**: black and pitted; 10,000-500,000 per plant; pods remain on stem; upright.
- **Leaves:** alternate; 8” long by 6” wide; coarsely toothed; fuzzy and sticky to touch.
- **Rosettes:** large with hairy leaves and saw-tooth margins; prominent deep veins; crinkly
- **Stem:** erect; coarse; branched; hairy
- **Roots:** taproot; fleshy; white; branched
- **Other:** poisonous to livestock and humans if ingested; member of the Nightshade family.

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Anytime up to seed

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Tamarisk/Salt Cedar
List B
Eliminate



- **Growth Form:** perennial shrub or small tree
- **Height:** 3-20’ tall
- **Reproduction:** seed and vegetative
- **Flowers:** pink to white; 0.125” wide in spikes 2” long; strong perfume scent; June-Sept
- **Seed**: tiny; spread by wind
- **Leaves:** alternate; scale-like; small and overlapping; often encrusted with salt; similar in appearance to cedar or juniper leaves
- **Stem:** slender branches; dark brown or reddish-brown
- **Roots:** taproot; branching once it reaches the water table
- **Other:** often found in floodplain areas; can spread downstream 12 miles per year; increases salt content in the soil and consumes large amounts of water; lowers water table; and degrades wildlife habitat value.

Option	HERBICIDE	RATE	TIMING
1	Tricloypyr (Aquatic label)	20-30% solution in oil	Cut-stump treatment or basal bark application, 12-15” above ground
2	Glyphosate	50-100% solution	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Hoary Cress/Whitetop

List B
Eliminate

- **Growth Form:** perennial
- **Height:** up to 2’ tall
- **Reproduction:** seed and rhizomes
- **Flowers:** white; 0.25” wide; 4-petaled; flat-topped clusters at end of branch; flowery smell; May-June
- **Seed**: heart-shaped seed capsules; flat; up to 4,800 seeds per plant; viable for 3 yrs
- **Leaves:** alternate; 0.5-4” long; 0.25-1.5” wide; blue-green with small white hairs; oval or oblong with toothed or smooth edges; upper leaves are clasping.
- **Stem:** erect; NOT waxy
- **Roots:** rhizomatous; growing 12-30’ per yr
- **Other:** looks similar to perennial pepperweed (page 30) & field pennycress. Pennycress is not hairy and has flowers that smell like dirt.

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1 oz/ac	Anytime

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Perennial Pepperweed

List B
Eliminate

- **Growth Form:** perennial
- **Height:** 1-3’ tall
- **Reproduction:** seed & rhizomes
- **Flowers:** dense clusters of white flowers near the end of branches; each flower is 0.125” wide; June-July
- **Seed**: round; 0.1” wide; sparsely haired; up to 6 million per acre
- **Leaves:** alternate; 4-11” long and 1-3” wide; lance-shaped; toothed; green to greyish-green; upper leaves smaller; leaves are NOT clasping; WAXY with white midrib
- **Stem:** erect; branching; from a woody crown forming thick patches
- **Roots:** woody stocks & rhizomes creeping 9’ deep, 10’ laterally
- **Other:** Looks similar to Hoary Cress/Whitetop but pepperweed is taller, and Hoary Cress has clasping leaves that are NOT waxy.

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	1 oz/ac	Anytime

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Wild Caraway
List B
Eliminate

- **Growth Form:** Biennial or perennial
- **Height:** 1-3’ tall
- **Reproduction:** seed
- **Flowers:** small; white or pinkish; form a loose, flat-topped group at the end of the stem; July-September
- **Seed**: 0.25” long; prominent length-wise ridges
- **Leaves:** alternate; finely divided into thread-like segments; 0.25” long
- **Stem:** erect; hollow; branched
- **Roots:** taproot
- **Other:** can be mistaken with young chamomile or yarrow. Make sure seeds are not accidentally dispersed if hand pulling.

Option	HERBICIDE	RATE	TIMING
1	Metsulfuron	1 oz/ac	Rosette to bud stage
2	2,4-D	2 qt/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Common Mullein
List C
Eliminate

- **Growth Form:** biennial
- **Height:** 2-6’ tall
- **Reproduction:** seed
- **Flowers:** yellow; 0.75” wide; 5-lobed; long club-shaped spikes; June-Aug
- **Seed**: viable for up to 80 yrs; tiny; black; poppy-seed size
- **Leaves:** alternate; 15” long by 5” wide; greyish-green; densely woolly; become smaller as you move up the stem.
- **Rosettes:** 3-5’ wide; greyish-green with soft fine hairs.
- **Stem:** one tall spike
- **Roots:** taproot
- **Other:** early invader on disturbed sites; looks similar to native green gentian, but green gentian has pinkish flowers and is not woolly

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	7 oz/ac	Rosette to bud stage.
2	Chlorsulfuron	1 oz/ac	

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Field Bindweed
List C
Eliminate

- **Growth Form:** Perennial
- **Height:** on the ground or a climbing vine
- **Reproduction:** seed and rhizomes
- **Flowers:** 1" wide; trumpet-shaped (like a morning glory); white to pink
- **Seed**: viable for 50+ yrs
- **Leaves:** 1-2" long by 1" wide; alternate; blunt to arrowhead-shaped.

- **Stem:** prostrate on ground; 1-6**'** long
- **Roots** taproots can grow 2-10' deep; rhizomes can be 30' deep and grow laterally to form colonies
- **Other:** shallow tillage and/or pulling is NOT recommended as it increases the number of plants

Option	HERBICIDE	RATE	TIMING
1	Dicamba + 2,4-D	2 qt/ac or 1 oz/gal	After full bloom or in the fall

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Cheatgrass/Downy Brome
List C
Eliminate

- **Growth Form:** Annual Grass
- **Height:** 4-30" tall; depending on moisture
- **Reproduction:** seed only
- **Flowers:** 1-sided drooping panicle; 2-6" long; spikelets will have 5-8 flowers 0.5-0.75" long; mature flower heads have a purplish hue and often get imbedded in clothing and animal fur; April-June
- **Seed**: 300 per plant; viable for 2 yrs
- **Leaves:** 2-6" long; dense soft hairs that give it a downy look
- **Stem:** erect; sender; branched at base
- **Roots**: fibrous
- **Other:** Emerges early in the spring and again in the fall. "Cheats" other vegetation out of space and nutrients. Fire hazard and flourishes after fire. Grazing only works early on before seed sets (seeds are pokey and animals will not eat them).

Option	HERBICIDE	RATE	TIMING
1	Glyphosate	8-10 oz/ac	Before seeding in spring or in fall when green

Sources: *Noxious Weeds of Colorado, 12th edition* & Google Images

Means of Control

Integrated Weed Management

A holistic approach to weed management that integrates different methods of weed control.
It incorporates...

Preventative Control

An ounce of prevention is worth a pound of cure!

- Properly manage your land by not overgrazing and by maintaining desired native/adapted species so that there is less opportunity for weeds to encroach.
- Be aware of weed seed sources
- Roadways, livestock, wildlife, wind, water, and disturbed areas
- Detect and identify early on
- Aggressively manage all infestations when they are small

Chemical Control

Use of herbicides to kill or suppress weeds

- Usually the most effective and time-efficient method
- Different herbicides work for different weeds.
  READ THE LABEL...**IT'S THE LAW!!!**
- Often selective to NOT kill grass

See herbicide recommendations on weed description pages or page 42.

Google Images

Means of Control

Biological Control

Use of living agents to suppress vigor and reduce the spread of weeds

- Biological agents limit the spread and density of target weed species by feeding on leaves, stems, roots and/or seed heads
- Must call Colorado Department of Agriculture Insectary to obtain the Biological Agent; NOT ALL AGENTS WORK IN ALL SITUATIONS.

Contact the **Colorado State Insectary** at 970-464-7916 or www.colorado.gov/agconservation/biocontrol

- Agents available for:
  - ⇒ Canada Thistle
  - ⇒ Dalmatian Toadflax
  - ⇒ Diffuse Knapweed
  - ⇒ Field Bindweed
  - ⇒ Leafy Spurge
  - ⇒ Musk Thistle
  - ⇒ Russian Knapweed
  - ⇒ Spotted Knapweed
  - ⇒ Tamarisk/Salt Cedar
  - ⇒ Yellow Toadflax

- **Depending on the weed species and class of livestock, grazing may be an effective tool. Goats tend to be the least picky about what they eat, so they may be the best option if you desire to use livestock as a weed management tool.**

Mechanical Control

Killing or suppressing weeds through physical disruption

- Pulling
- Plowing
- Digging
- Disking
- Mowing

Cultural Control

Establishment of competitive and desired vegetation

See Seeding on pages 37-40.

Seeding

It is important to establish competitive & desired vegetation BEFORE weeds establish!!! You can establish good vegetation by planting forbs or seeding with desired grass/wildflower seed mixes of good quality & purity.

9 Steps to Successful Seeding

Key #1 – Kill the Weeds First

At seeding time, there should be no actively growing weeds.

Key #2 – Use Adapted Species

Selecting species that are adapted for the conditions you are planting in will make all the difference. Soil, climate, elevation, and exposure all factor into species selection. Furthermore, even if a species grows well at 8,000' elevation, it does not mean that it will grow well in all conditions at 8,000'. Wetland species will not likely do well in dryland conditions and vice versa. Likewise, plants that typically grow on Northeast facing slopes may not grow Southwest facing slopes. Just because it grows well on the Front Range, doesn't mean it will grow well up here in the mountains!

Key #3 – Prepare a Good Seedbed

A proper seedbed is firm and free of competing vegetation. ***Correct firmness is when an adult footprint is only slightly visible on the prepared bed prior to the seeding operation.*** The seedbed can be firmed, if needed, by pulling a commercial or homemade packer or roller. A firm seedbed is essential for proper seeding depth. You have seeded too deep if you cannot see a few seeds on the soil surface.

If the seedbed is very uneven, consider drainage concerns prior to planting. Where will water pool? If needed, attempt to level out the seeding area by moving soil around or adding soil. Be cautious, though, to verify that any soil you add to the site is free of weeds!

Seeding

9 Steps to Successful Seeding Continued...

Key #3 Preparing a Good Seedbed Cont...

Most species should be planted at a shallow depth of ¼ to ½ inch. Larger seeds can be planted up to 1 inch deep. Seed to soil contact is imperative. Seeds spread on top of vegetative residue will have much lower germination rates.

Key #4 – Seed at the Right Time

The three main seeding windows in Grand County are:

Spring (late April-May right after snow melts off)
Late Summer (mid July-early August during the summer monsoons)
Late Fall (mid to end of October until first perennial snow)

Key #5 – Seed at the Proper Rate

You should seed at a rate of 40 seeds per square foot.

When broadcast seeding by hand, the best way to determine your personal seeding rate is to cut out a 12"x12" piece of cardboard. Spray paint it with black paint. Then, toss some seed onto the cardboard square. If you count more than 40 seeds on that square, you are seeding too thick. If there are not 40 seeds on that square, you need to seed a little heavier.

If you find it difficult to regulate your seeding rate with small seeds, *you can mix in a filler of sand, sawdust, or potting soil to get adequate distribution of seeds.* Note that drill seeders or broadcast seeders can be calibrated to specific seeding rates, thus minimizing human errors.

Seeding

9 Steps to Successful Seeding Continued...

Key #5 – Seed at the Proper Rate Photo Illustration

1' x 1' square with 40 seeds on it

Key #6 – Cover Your Seeds

Seeds are lost when wind and water wash them away, or birds and small mammals eat them.

To increase your seeding success rate, it is best to cover your seed. You can cover your seeds by raking or dragging over your seeds with soil. Mulch is also a good cover. Sawdust, straw, and peat moss are good options for mulch. If you are interseeding into existing grass, mulch may not be necessary. ***When you look down at your mulched and seeded area, you should see about 50% mulch and 50% seed covered soil.*** If you apply it properly, you won't have to remove the mulch later; it'll just break down and disappear.

Key #7 – Water, Water, Water

Seeds and seedlings need adequate moisture to germinate and grow. Even if you are buying a drought-tolerant seed mix, your little seeds need ample water.

Make sure to water lightly and frequently. If you drench them too much, you risk washing them away.

Seeding

9 Steps to Successful Seeding Continued...

Key #8 – To Fertilize or Not to Fertilize?

To fertilize or not to fertilize, that is the question. The answer is, ***"IT DEPENDS".*** If you are seeding into an area that you know is weed free and does not have any weed seeds in it, then you are probably okay to fertilize at the same time as seeding.

If, however, you are unsure that it is a weed free area, then you may want to wait to fertilize. Fertilizer is non-specific, meaning that it will boost the growth of anything that it comes into contact with, including weeds. Because weeds are genetically predisposed to rapid growth and establishment, fertilizer may give them an even bigger boost.

The safe option would be to wait for one growing season to make sure your seeds can outcompete any weeds. Once seed is on the ground, hand pull weeds and avoid the use of herbicides in the first growing season.

Key #9 – Wait to Graze

If you are planning to graze the location you are seeding, it would be best to

Wait one entire growing season (preferably two growing seasons) prior to grazing any animals on the seeded site.

This will give the sprouts a full year to grow and establish. *Otherwise, you may be seeding again before you know it.*

Herbicide Recommendations

These herbicide recommendations are provided by the Grand County Division of Natural Resources.

READ AND FOLLOW ALL INSTRUCTIONS ON THE HERBICIDE LABEL PRIOR TO USE. THE LABEL IS THE LAW!

Don't forget to add a nonionic surfactant at a rate of 0.32 oz/gallon to reduce water surface tension and allow for better mixing of water and chemical. ***You may use commercial surfactants or generic dish soap.***

Contact Grand County DNR with questions...970-887-0745

Organic Herbicide

Organic herbicides have gained popularity over the last few years. They are often made from a mix of vinegar, salt, and dish soap.

There are mixed reviews on the effectiveness of organic herbicides. Some say they work great; others say they show initial results but the plants bounce right back within a week or two.

Anyone considering the use of organic herbicides should note that they are NON-SPECIFIC, meaning that they have the potential to kill anything they are sprayed on (including grass, desired native plants, and potentially soil organisms).
TAKE CARE TO SPOT SPRAY ONLY WHAT YOU WANT TO DIE!!!

All in all, do your research and make sure you know the facts prior to choosing your herbicide preference.

Timing is Everything

Herbicides often target a specific growth stage of a plant and are only effective if applied at the proper time. Check to see when the herbicide you plan to use is most effective and be sure to apply at that time. If you have passed that time, see if there is an alternative herbicide that you can use instead.

NOXIOUS WEED	MILESTONE	CHLORSULFURON	2,4-D	CURTAIL	GLYPHOSATE
Black henbane	X		X		
Chamomile	X	X		X	
Cheatgrass/Downy brome					X
Common Mullein	X	X			
Common Tansy		X			
Cypress Spurge	X				
Dame's Rocket		X			
Field bindweed			X		
Hoary cress/Whitetop		X	X		
Houndstongue		X	X		
Leafy Spurge	X	X	X		
Knapweeds	X			X	
Orange hawkweed	X		X	X	
Oxeye daisy	X				
Perennial Pepperweed		X	X		
Sulphur Cinquefoil	X				
Tamarisk/Salt cedar	**CALL 887-0745**				X
Thistles	X	X	X	X	
Whitetop/Hoary cress		X	X		
Wild caraway			X		
Toadflax(s)		X			

Additional Resource for herbicides and target species: www.middleparkcd.com/wp-content/uploads/2022/07/herbicides-list.pdf

** See species-specific rate on species pages. Contact Grand County DNR with questions. 970-887-0745

Source: Reference #9

Sprayer Calibration

It is critical to know the output of a sprayer in order to add the proper amount of herbicide to the tank. *Applying too heavy can kill desirable species and wastes money. Applying too light contributes to resistance, reduces effectiveness, and wastes money.*

Handgun or Backpack Sprayer

1.Measure a plot that is exactly 18.5 ft X 18.5 ft (1/28th of an acre).

2. Spray the plot uniformly with water, keeping the sprayer pressure constant. ***Be sure to record the length of time it takes you to spray the entire area using a stopwatch.***

3. Spray into a bucket (or a graduated container such as a Nalgene) for the same number of seconds. **Keep the sprayer pressure constant!**

4. Measure the number of ounces of water collected in the bucket or Nalgene.

5. The number of ounces of water measured from the bucket is equal to the number of gallons per acre (GPA) the sprayer is delivering.

6. Add the proper amount of herbicide to your tank using the chart on the right.

Gallons/acre	Recommended Herbicide Rate/Acre				
(from step 5)	5 fl oz/ac	7 fl oz/ac	1 pint/ac	1 quart/ac	2 quarts/ac
20	7.5 cc/gal	10.5 cc/gal	5 tsp/gal	10 tsp/gal	3.25 fl oz/gal
30	5 cc/gal	7.0 cc/gal	3 tsp/gal	6 tsp/gal	2 fl oz/gal
40	3.8 cc/gal	5.3 cc/gal	2⅔ tsp/gal	4.75 tsp/gal	1⅔ fl oz/gal
50	3.0 cc/gal	4.2 cc/gal	2 tsp/gal	3.75 tsp/gal	1.25 fl oz/gal
60	2.5 cc/gal	3.5 cc/gal	1⅔ tsp/gal	3.25 tsp/gal	6⅔ tsp/gal
70	2.1 cc/gal	3.0 cc/gal	1⅓ tsp/gal	2.75 tsp/gal	5.5 tsp/gal
80	1.9 cc/gal	2.6 cc/gal	1.25 tsp/gal	2⅓ tsp/gal	4.75 tsp/gal
90	1.7 cc/gal	2.3 cc/gal	1 tsp/gal	2 tsp/gal	4.25 tsp/gal
100	1.5 cc/gal	2.1 cc/gal	1 tsp/gal	2 tsp/gal	3.75 tsp/gal

Liquid conversions: tsp = teaspoons; TBS = tablespoons; fl oz = fluid ounces; 1 cc = 1 ml; 3 teaspoons = 1 tablespoon; 8 fluid ounces= 1 cup; 2 tablespoons = 1 fluid ounce; 1 cup = 16 tablespoons

Source: Reference # 3 & 4

Sprayer Calibration

Boom or Boomless Sprayer

Volume Method

1. On level ground, fill sprayer tank to a known level with water.

2. Turn on sprayer until all nozzles have output, shut off and refill tank to desired level.

3. Measure off ¼ of an acre, marking the start and end with a flag.

Width of boom (feet)	Linear feet to cover ¼ acres
2	5445
4	2723
6	1815
8	1362
10	1090
20	545
30	363

4. Drive the measured ¼ acre with the speed that you will be using to spray, turning on the sprayer at the starting mark and off at the ending flag.

5. Return to the level ground that you filled the sprayer at and carefully measure the amount of water it takes to refill to the known level from step 1.

6. Multiply the amount from above step by 4. This is GPA (Gallons Per Acre).

Stationary Method

1. On level ground, fill sprayer tank with water and drift agent (if using).

2. Turn on sprayer and measure spray pattern width in feet.

3. Collect liquid from each nozzle for 1 minute. Measure in ounces.

4. Divide ounces by 128 to determine GPM (Gallons Per Minute).

5. Determine speed (MPH) you will be using during spraying.

6. With the below formula calculate GPA (Gallons Per Acre).

GPA = (GPM x 495)/(MPH x swath width in feet)

Source: Reference # 3

Index

Weeds

Other

Google Images

References

1. *US Forest Service Thistle Identification Chart.* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5186034.pdf

2. *Colorado Weed Management Association Noxious Weed Descriptions. Noxious Weeds of Colorado, 12th edition, 2015.* http://www.cwma.org/noxweeds.html#list

3. *Larimer County Noxious Weed Management Guide.* https://www.larimer.org/weeds/weed_management_guide.pdf

4. *Sprayer Calibration Guide from Invasive Plant Management Guide for Natural Area Managers.* http://www.middleparkcd.com/wp-content/uploads/2013/08/Sprayer-calibration-new.pdf

5. *Grand County Noxious Weed Management Plan.* http://co.grand.co.us/DocumentCenter/View/75

6. *Colorado Noxious Weed Act.* http://www.100thmeridian.org/laws/pdfs/Colorado%20Noxious%20Weed%20act.pdf

7. *Colorado State Insectary.* www.colorado.gov/agconservation/biocontrol

8. *A ll images are from Google Images*

9 . *Appendix G: Herbicides, Trade Names, and Target Species.* www.middleparkcd.com/wp-content/uploads/2022/07/herbicides-list.pdf

What to do if you have a weed problem and need help

1. Look through this guide and try to identify the weed.
2. Take the precautionary actions suggested in this guide to contain the weed and reduce its spread.
3. Try not disturb soil, if at all possible.
4. If soil disturbance is necessary, reseed with desirable species ASAP.
5. Remember, weed management is NOT a one time deal; it will require ongoing efforts (likely for many years to come). Patience, Persistence, and Perseverance!
6. If you need further assistance, **contact Grand County DNR at 970-887-0745** SOONER RATHER THAN LATER!!!