

Appendix A:

Town of Crested Butte Designated Noxious Weed List Description and Treatment Methods

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The Crested Butte Noxious Weed Advisory Board has also compiled a Noxious Weed Watch list. These weeds are currently not seen as a problem in Crested Butte but they could be in the future. They may be added to the Town's Noxious Weed list if they become a problem. Citizens shall be encouraged to eradicate these weeds but there will be no penalty if they do not.

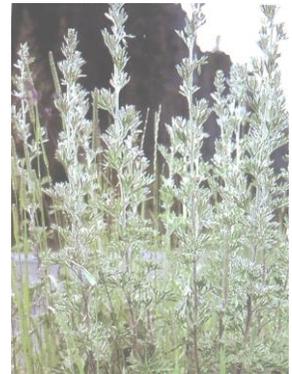
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III. Description and Treatment Methods

1. **ABSINTHE WORMWOOD (*Artemisia absinthium*)**

Absinthe Wormwood is native to Eurasia, the Middle East, and North Africa. It is a long lived perennial that possesses a strong sage odor and bitter taste. Plants grow 2 to 4 feet in height and are prolific seed producers. Plants are woody at the base and regrow from the soil level each spring. The stems are numerous and are covered with fine, gray hairs, while the leaves are a blue-olive green, alternate and highly divided. Flowers are small, yellowish and arranged in large, spike-like panicles. Habitats include disturbed areas, moist soils, and are also shade tolerant. Reproduces primarily through seed production, but can also spread by short roots. The plant is a prolific seed producer with seedlings emerging anytime from late spring to early fall. Seeds may remain viable for 3 to 4 years.



Comments: The key to effective control of Absinthe Wormwood is a combination of control methods. It is fairly easy to control with chemicals in combination with mechanical control.

Biological Control: There are no biological controls for Absinthe Wormwood.

Chemical Control: Call Town of Crested Butte Parks and Recreation or a licensed applicator for specific recommendations.

Cultural Control: Complete removal of any seedlings or newly established plants by continual hand pulling is possible.

Mechanical Control: Hand pull or dig when soil is moist. Make certain to pull all the roots, including short horizontal roots. Bag specimens carefully so as to not scatter seeds after flowering. Multiple mowings prior to seed generation can cause stress and may provide a control option.

2. **BLACK HENBANE (*Hyoscyamus niger*)**

Black Henbane was introduced from Europe as an ornamental and medicinal herb. It is mostly found on the western slope. The plant blooms June through September and a mature plant reaches 1 to 3 feet in height. Its foliage is accompanied with a foul odor. Leaves are shallowly lobed to



coarsely toothed with sticky hairs. The outer part of the flower is brownish yellow with a purple center and veins. Black Henbane is poisonous to humans and livestock if ingested. This annual or biennial reproduces by seed. Seeds germinate easily and will remain viable in the soil for several years.

Comments: The key to effective control of Black Henbane is guarding against disturbance and overuse. Mechanical control and chemicals are the most commonly recommended method of control.

Biological Control: There are no biological controls for Black Henbane.

Chemical Control: Call Town of Crested Butte Parks and Recreation or a licensed applicator for specific recommendations.

Cultural Control: Complete removal of any seedlings or newly established plants by continual hand pulling is possible.

Mechanical Control: Hand pull or dig from moist soil, so the entire tap root system can be removed. Be sure to bag specimens carefully if removed during or after flowering.

3. CANADA THISTLE (*Cirsium arvense*)

Canada Thistle is a member of the Aster family and was introduced from Europe. It is a creeping perennial which reproduces by seeds and fleshy, horizontal roots. The erect stem is hollow, smooth and slightly hairy, 1 to 5 feet tall, simple, and branched at the top. The flower color is primarily lavender, pink, or purple. Canada Thistle emerges in May in most parts of our area. It is one of the most widespread and economically damaging noxious weeds in Colorado. Infestations are found in cultivated fields, riparian areas, pastures, rangeland, forests, lawns and gardens, roadsides, and in waste areas. Because of its seeding habits, vigorous growth, and extensive underground root system, control and eradication are difficult. This perennial reproduces from vegetative buds in root system and from seed.



Comments: Canada Thistle is best managed through an integrated management system that emphasizes competitive, desirable plants.

Biological Control: Three insects currently available. It is best to release a complex of insects (different insects that will stress different parts of the plant.) *Ceutorhynchus litura* – a weevil that stresses the crown of the plant. *Urophora carduii* – a stem and shoot gall fly. *Cassida rubiginosa* – leaf beetle. Biological control is not encouraged due to the propensity for insects

to escape onto native Thistles, thus killing the desired native plants.

Chemical Control: Call Town of Crested Butte Parks and Recreation or a licensed applicator for specific recommendations.

Cultural Control: Maintain soil fertility and moisture at optimum levels to favor grass growth.

Mechanical Control: Research indicates that mowing of Canada Thistle may be effective when done repeatedly at two week intervals over a period of several years. Pulling and digging up Canada Thistle is ineffective as the plant has such an extensive root system.

4. COMMON TANSY (*Tanacetum vulgare*)

Common Tansy is native to Eurasia. It is an herbaceous plant, 3 feet tall, up to 5 feet in shaded areas, and erect. A single stem branches extensively to the top into short stems forming a flat-topped cluster of numerous button-like flower heads. The flowers are bright yellow Daisy-like discs up to .5" wide. It blooms from July through October. Tansy is distasteful and even toxic to some grazing animals. This perennial reproduces by numerous tufted seeds dispersed by wind and water. It also reproduces vegetatively by forming new plants from root fragments.



Comments: Common Tansy is best managed through an integrated management system that emphasizes competitive, desirable plants.

Biological Control: There are no biological controls for Common Tansy

Chemical Control: Call Town of Crested Butte Parks and Recreation or a licensed applicator for specific recommendations.

Cultural Control: Minimize soil disturbance and re-vegetate any disturbed areas promptly. Maintain a healthy native community.

Mechanical Control: Mow or cut infestations before flowering and seed-set occur to eliminate seed production. Multiple treatments will be required to exhaust the plant's resources.

5. DALMATIAN TOADFLAX (*Linaria genistifolia*)

Dalmatian Toadflax is a member of the Figwort family. It was introduced as an ornamental from Europe and is common in Glenwood Springs. It is a creeping perennial with stems from 2 to 4 feet tall. The flowers are Snapdragon-shaped, bright yellow, with orange centers; the leaves are waxy and heart-shaped. Dalmatian Toadflax is especially well adapted to arid sites and can spread rapidly once established. Because of its deep, extensive root system and heavy seed production, this plant is difficult to manage. This aggressive perennial reproduces by creeping rootstocks as well as by seed. A mature plant can produce up to 500,000 seeds.



Comments: Due to the high genetic variability of the Toadflax species, it is critical to integrate as many management strategies as possible into the control program.

Biological Control: The defoliating moth, *Calophasia lunula*, has been released on Dalmatian and Yellow Toadflax. It may defoliate up to 20% of the leaves of the plant. *Eteobalea intermediella*, a root boring moth, and *Mecinus janthinus*, a stem boring weevil, are also available.



Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Re-seed disturbed areas adjacent to Toadflax infestations with appropriate perennial grasses (Thickspike Wheatgrass and Streambank Wheatgrass). The combination of herbicide spraying and seeding competitive grasses controls Dalmatian Toadflax better than spraying alone.

Mechanical Control: Hand pulling small infestations can be effective. Pulling every year and repeated mowing 2-3 times per year will slow spread and reduce seed production.

Education: The key to Dalmatian Toadflax management is to create an awareness among homeowners, nurseries, landscapers, and landscape architects that Dalmatian Toadflax is a noxious weed and therefore should not be specified in plantings, sold in nurseries or planted in home gardens or large-scale landscape projects.



6. DAME'S ROCKET (*Hesperis matronalis*)

Dame's Rocket is a member of the Mustard family. It is a native of Eurasia and is a biennial or short-lived perennial forb. The flowers are white to purple with four petals and are clustered in loose terminal

stalks. Flowers appear from May to August and the plant can produce seeds and flowers on any flower cluster at the same time. It is most often found in gardens, partly shaded woodlands, ditches, roadsides, pastures, rangelands, thickets, open woods, disturbed sites, and other areas that have moist, well-drained soils and full sun to light shade. This biennial or short-lived perennial reproduces only by seed.

Comments: The key to effective control of Dame's Rocket is prevention. Locate and remove plants immediately before plants set seed.

Biological Control: There are no biological controls for Dame's Rocket.

Chemical Control: Call Town of Crested Butte Parks and Recreation or a licensed applicator for specific recommendations.

Cultural Control: Prevent the establishment of new infestations by minimizing disturbance and seed dispersal, eliminating seed production and maintaining healthy native communities.

Mechanical Control: Hand pull or dig while the soil is moist, making sure to get the roots to prevent resprouting. Removing flowers before the plant sets seed will also be effective. Be sure to bag the specimens carefully so the spread of seed does not occur.

7. *DIFFUSE KNAPWEED (Centaurea diffusa)*

Diffuse Knapweed is a member of the Aster family. Diffuse Knapweed was introduced from Europe and is a biennial or short-lived perennial forb, which reproduces only by seed. The plant usually produces a single main multi-branched stem that is 1 ½ to 2 feet tall. The flower is white or pink with bracts. This biennial reproduces primarily by seed but may also regenerate from the crown.



Comments: The key to effective control of Diffuse Knapweed is to prevent the plant from flowering and going to seed. An integrated weed management approach is recommended.

Biological Control: The Seedhead Weevil (*Iarinus minutus*) and Root Weevil Fly (*Cyphocleonus achates*) are available.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Reseeding of disturbed sites with fast-growing grasses help prevent Diffuse Knapweed establishment. Contact your local Natural Resources Conservation service for seed mix recommendations.

Mechanical Control: Any mechanical or physical method that severs the root below the soil surface will kill Diffuse Knapweed. Mowing or chopping is most effective when Diffuse Knapweed plants are at full bloom. Properly dispose of the flowering cut plants, since seeds can mature and become viable after the plant has been cut down.

8. HOARY CRESS (*Cardaria draba*)

Hoary Cress, also known as Whitetop, is a member of the Mustard family, and was probably introduced from Europe in alfalfa seed. It is a creeping perennial, which reproduces by seed and creeping roots. The extensive root system spreads horizontally and vertically with frequent shoots arising from the rootstock. It grows erect from 10 to 18 inches high and has a gray-white colored leaf. The flowers are white and numerous in compact flat-topped clusters which give the plant its name. Hoary Cress is one of the earliest perennial weeds to emerge in the spring, producing flowers in May or June. It grows in waste places, cultivated fields, and pastures, and is capable of vigorous growth. Hoary Cress is prevalent in Crested Butte. Hoary Cress is a highly competitive plant forming a monoculture, and once established it easily displaces native vegetation.



Comments: The key to effective control of Hoary Cress is prevention. Common in Crested Butte.

Biological Control: There is no biological control available for Hoary Cress

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Prevent the establishment of new infestations by minimizing disturbance and seed dispersal, eliminating seed production, and maintaining healthy native communities.

Mechanical Control: Mowing several times before the plants bolt stresses Hoary Cress and forces the plant to use nutrient reserves stored in the root system. Combining mowing with herbicide will further enhance control of this weed. Mow repeatedly through the summer and then apply herbicide in the fall.

9. **HOUNDSTONGUE** (*Cynoglossum officinale*)

Houndstongue is a toxic biennial plant introduced from Europe, likely as a contaminant in cereal seed. Houndstongue is rough in texture and produces flowers in long, coiled stalks. In addition to poisoning animals that ingest it, Houndstongue also produces prolific amounts of irritating bur-like seeds that cling to animals and clothing like Velcro. It is a biennial plant that can grow up to 4 feet tall. The plant has several dull reddish-purple flower clusters that are narrow and slightly coiled. The entire plant is covered with long soft hairs. It is commonly found in pastures, along roadsides, forest rangelands, abandoned fields, and disturbed habitats. This biennial is a prolific seed producer. It is toxic to livestock and can also cause dermatitis in humans.



Comments: Houndstongue reproduces by seed and is self-pollinating. Seed production varies from about 314 to 674 seeds per plant. Seeds remaining on the soil surface can remain viable up to two years.

Biological Control: There is no biological control available for Houndstongue.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Re-seed disturbed sites with fast-growing native grasses. Promote healthy grass growth through proper irrigation and fertilization.

Mechanical Control: Houndstongue is a prolific seed producer and the seeds are readily spread by their ability to stick to wildlife and domestic animals. Physical removal of the plant at flowering or in early seed formation, by pulling or digging, will break the cycle of the plant.

10. **LEAFY SPURGE** (*Euphorbia esula*)

Leafy Spurge, a member of the Spurge family, was introduced from Europe. It is a creeping perennial that reproduces by seed and extensive creeping roots. The roots can extend as deep as 30 feet from a plant that grows 1 to 3 feet tall, with pale green shoots and small yellow-green flowers. The plant, including the root, has milky latex that is damaging to eyes and sensitive skin. Leafy spurge is an extremely difficult plant to control because of its extensive sprouting root. It is adapted to a wide variety of Colorado habitats and is very competitive with other plant species. If it becomes established in rangeland, pasture, and riparian sites, it may exclude all other vegetation due to its competitive nature. This perennial grows up to three feet tall and



reproduces by vigorous root stalks and seed.

Comments: The most effective method of control is to prevent establishment through responsible land management. New infestations are much more easily controlled than established infestations.

Biological control: Sheep or goats will graze leafy spurge. The Flea Beetles (*Apthona nigriscutis*, *A. lacertosa*, and *A. cyprissiae*), are effective especially when combined with grazing and/or herbicide. For more information contact the Palisade Insectary. These insects are available upon request at no charge to the public.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Establishment of selected grasses can be an effective cultural control of Leafy Spurge. Any activity that encourages vigorous grass growth is very important.

Mechanical Control: Due to the extensive root system, hand pulling this plant is not a viable option. Mowing Leafy Spurge at 14 to 21 day intervals may cause higher susceptibility to fall applied herbicides.

11. MUSK THISTLE (*Carduus nutans*)

Musk Thistle is a member of the Aster family. Introduced from Eurasia, it is a winter annual or biennial which reproduces by seed. The first year's growth is a large, compact rosette from a large, fleshy, corky taproot. The second year stem is erect, spiny, 2 to 6 feet tall and branched at the top. The waxy leaves are dark green with a light green midrib and mostly white margins; flowers are purple or occasionally white. Musk Thistle is also known as "nodding Thistle" and is commonly found in pastures, roadsides, and waste places. It prefers moist bottomland soil, but also can be found on drier uplands. Musk Thistle is a biennial and the key to its successful management is to prevent seed formation.



Comments: The key to effective control of Musk Thistle is to prevent the plant's seed production. Planting desirable grasses and forbs will out-compete the Musk Thistle.

Biological Control: The Musk Thistle Seed Head Weevil, *Rhinocyllus conicus*, is wide-spread in Colorado. Larvae of this insect destroy developing seeds but are not 100 percent effective by themselves. The Weevil normally impacts seed production by about 50 percent. Herbicides can be combined with Weevils if the insects are allowed to complete their life cycles. Another Weevil, *Trichosiromus horridus*, attacks the crown area of Musk Thistle rosettes and weakens the plant before it bolts. This Weevil has reduced stand density in areas where it has become

well established. A leaf-feeding beetle, *Cassida rubiginosa*, causes considerable damage by skeletonizing leaves. It is recommended to release more than one type of insect on a weed since each type may work on different parts of the plant. Contact the Palisade Insectary for more information. Biological control is not encouraged due to the propensity for insects to escape onto native Thistles, thus killing the desired native plants.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Musk Thistle, like other biennial Thistles, thrives on disturbance. The best management is to minimize disturbance. If it does occur be certain to revegetate with competitive perennial grasses. Establishment of selected grasses can be an effective cultural control of Musk Thistle.

Mechanical Control: The most effective type of mechanical control is to hand pull this plant prior to flowering. This can be unrealistic on large acreage or when the ground is very dry. Another option is to use a shovel to cut the root below the surface of the soil, taking care not to disturb the soil more than necessary. If this is done prior to flowering the plant can be left in place after it is cut. If it has already flowered the plant should be removed and placed in a bag and disposed of. Mowing is not effective on this species unless repeated numerous times throughout the growing season since Musk Thistle will flower and produce seed even after one or two mowings.

12. ORANGE HAWKWEED (*Hieracium aurantiacum*)

Orange Hawkweed is a perennial plant originating from Europe. It reproduces from runners, rhizomes, sporadic root buds, and seed. Leaves are basal with one or two small leaves occasionally occurring on the bristly stem. Rosette leaves are four to six inches in length, spatula shaped, and have finely toothed margins. The plant grows 10 to 20 inches in height. Flowers have 5 to 35 red-orange-yellow heads with petals that are strap shaped with notched tips. Orange Hawkweed is a rhizomatous perennial escaped ornamental and typically grows in clusters.



Comments: Orange Hawkweed is a Colorado Noxious Weed List A plant! Notify the Parks and Recreation Director immediately if you find this plant. The key to effective control of Orange Hawkweed is preventing the establishment of plant communities through sound land management practices. A combination of cultural and herbicide control can be effective.

Biological Control: No biological control for Orange Hawkweed is available.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: When native forbs and grasses are already present, assisting plant competitiveness by supplementing fertilizers can be an effective cultural control method.

Mechanical Control: Not recommended because of the weed's ability to reproduce by stolens, rhizomes and root fragments. This often renders mechanical control obsolete.

13. OXEYE DAISY (*Chrysanthemum leucanthemum*)

Oxeye Daisy, a member of the Aster family, is a native of Eurasia. It is an erect perennial plant with white ray and yellow disk flowers which bloom from June through August. Oxeye Daisy is commonly sold in wildflower seed mixes or transplanted as an ornamental despite its tendency to crowd out more desirable vegetation. Oxeye Daisy is prevalent in Crested Butte and is a rhizomatous perennial escaped ornamental.



Comments: It aggressively invades fields where it forms dense populations and decreases plant species diversity. It is a rapidly spreading weed in Crested Butte.

Biological Control: Goats or sheep can be effective in the control of Oxeye Daisy.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Prevent the establishment of new infestations by minimizing disturbance and seed dispersal and maintaining healthy native communities. It is easily killed by intensive cultivation.

Mechanical Control: Hand pull or dig when soil is moist and infestations are small. Oxeye Daisy is fairly shallow-rooted. Make sure to pull up all of the roots. Bag specimens carefully so as to not scatter seeds if removed during or after flowering.

Education: The key to Oxeye Daisy management is to create an awareness among homeowners, nurseries, landscapers, and landscape architects that Oxeye is a noxious weed and therefore should not be specified in plantings, sold in nurseries or planted in home gardens or large-scale landscape projects.

14. PLUMELESS THISTLE (*Carduus acanthoides*)

Plumeless Thistle is a member of the Aster family. Introduced from Eurasia, it is a winter annual or biennial which reproduces by seed. This plant can be distinguished from Musk Thistle by its smaller flowers from ½ to 1 inch in diameter. The leaves of Plumeless Thistle lack the prominent white margin present on Musk Thistle leaves. The plant may grow to a height of 5 feet or more. Flowers are reddish-purple and are either solitary or clustered. Taproots are large and fleshy. Plumeless Thistle is an extremely prolific seed producer. It is found in pastures, river valleys, and along roadsides. This biennial is a prolific seed producer.



Comments: Preventing Plumeless Thistle seed production and planting desirable grasses and forbs to out-compete Plumeless Thistle is effective.

Biological Control: The same Seed Head Weevil, *Rhinocyllus conicus*, that attacks Musk Thistle also feeds on Plumeless Thistle seeds. Biological control is not encouraged due to the propensity for insects to escape onto native Thistles, thus killing the desired native plants.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Plumeless Thistle, like other biennial Thistles, thrives on disturbance. The best management is to minimize disturbance and revegetate with competitive perennial species.

Mechanical Control: Mowing is generally not effective on Plumeless due to the plant's capacity for rapid re-growth. Hand cutting is not effective unless there are repeated follow-up treatments. Hand cutting should only be conducted if there is a commitment to follow-up efforts. Plumeless tends to branch out where it is cut and then it re-flowers. Pulling Plumeless can be very effective, especially if done after a light rain. Hand pulling, with a good set of gloves, is preferable to shoveling. Shoveling disturbs the ground thus creating a potential seedbed for future infestations.

15. RUSSIAN KNAPWEED (*Acroptilon repens*)

Russian Knapweed is a member of the Aster family introduced from Europe. It is a creeping perennial that reproduces by seed and creeping, horizontal roots. The ridged stems are stiff and 1 to 3 feet high with Thistle-like flowers that are lavender to white. It is very difficult to control or eradicate once it becomes established. It grows in cultivated fields, along ditch banks, fence rows, roadsides, and in waste places.



Russian Knapweed is toxic to horses. Russian Knapweed is a non-native deep rooted perennial that spreads by aggressive, creeping, horizontal roots (rhizomes) and seeds.

Comments: Like other creeping perennials, the key to Russian Knapweed control is to stress the weed and cause it to expend nutrient stores in its root system. An integrated management plan should be developed that places continual stress on the weed. Currently, the best management plan includes cultural control combined with mechanical and/or chemical control techniques. A single control strategy, such as mowing or an herbicide, usually is not sufficient. The plant is toxic to horses, however they must consume it over a period of time before poisoning will occur. Once poisoning occurs horses are unable to chew and advance food to the back of their mouths, swallowing is impaired and horses can drink only if they immerse their head in water far enough to get water to the back of their mouths. Poisoning is irreversible and death by starvation will occur.

Biological Control: A gall-forming Nematode, *Subanguina picridis*, is currently being monitored for effectiveness but is not yet available to the public.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Russian Knapweed tends to form monocultures by eliminating other plants. Therefore, sowing desirable plant species is necessary after the weed is controlled. Research indicates that the native grasses, Streambank Wheatgrass and Thickspike Wheatgrass will establish in an area after Russian Knapweed is suppressed with herbicides. If the Russian Knapweed stand is not too old and grasses are still present, stimulating grass growth by irrigation (where possible) should increase grass competition with Knapweed and keep it under continual stress.

Mechanical Controls: Repeated mowing combined with herbicide applications will gradually stress the plant.

16. SCENTLESS CHAMOMILE (*Matricaria perforata*)

Scentless Chamomile is a bushy annual plant. It grows from ½ to 2 feet tall and has showy, white flowers that appear from May to October. It is very similar in appearance to the strong scented species, but can be distinguished by its lack of odor. Scentless Chamomile was imported from Europe as an ornamental, but has escaped and now invades natural areas worldwide. It is prevalent in Crested Butte. This biennial reproduces via seed; seed is spread by wind, birds, and human activity.

Comments: It aggressively invades fields where it forms dense



populations and decreases plant species diversity. It is a rapidly spreading weed in Crested Butte.

Biological Control: Goats or sheep can be effective in the control of Scentless Chamomile.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Prevent the establishment of new infestations by minimizing disturbance and seed dispersal and maintaining healthy native communities. It is easily killed by intensive cultivation.

Mechanical Control: Hand pull or dig when soil is moist and infestations are small. Scentless Chamomile is fairly shallow rooted. Make sure to pull up all of the roots. Bag specimens carefully so as to not scatter seeds if removed during or after flowering.

Education: The key to Scentless Chamomile management is to create an awareness among homeowners, nurseries, landscapers, and landscape architects that Scentless Chamomile is a noxious weed and therefore should not be specified in plantings, sold in nurseries or planted in home gardens or large-scale landscape projects.

17. SCOTCH THISTLE (*Onopordum acanthium*)

Scotch Thistle is a member of the Aster family. It is a biennial that was introduced from Europe or eastern Asia and can reach a height of 8 feet. The rosette forms the first year and can have leaves up to 2 feet long and 1 foot wide. The second year the plant produces flowers that are reddish-purple to violet. It is found primarily along roadsides. This biennial reproduces solely by seed.



Comments: The key to effective control of Scotch Thistle is to guard against disturbance and to limit seed production.

Biological Control: Goats will graze Scotch Thistle, preventing seed production. *Urophora stylata*, a fly predator, is used to help control this Thistle. The female fly lays eggs in the seed head of the Thistle. The maggot then consumes the seed in the flower. Biological control is not encouraged due to the propensity for insects to escape onto native Thistles, thus killing the desired native plants.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Establishment of selected grasses can be an effective cultural control of Scotch Thistle.

Mechanical Control: Any mechanical or physical method that severs the root below the soil surface will kill Scotch Thistle. Mowing or chopping is most effective when Scotch Thistle plants are at full-bloom. Be sure to properly dispose of the flowering cut plants since seed can mature and become viable after the plant has been cut down.

18. SPOTTED KNAPWEED (*Centaurea maculosa*)

Spotted Knapweed is a member of the Aster family. Native to Central Europe, it is a simple perennial that reproduces from seed and forms a new shoot each year from a taproot. The plant can have one or more shoots up to 4 feet tall. Flower color is usually lavender to purple. Spotted Knapweed occupies dry meadows, pastures, stony hills, roadsides, and the sandy or gravel flood plains of streams and rivers, where soils are light textured, well-drained, and receive summer precipitation. Spotted Knapweed tolerates dry conditions, similar to Diffuse Knapweed, but will survive in higher moisture areas as well. Spotted Knapweed is a short-lived, non-creeping perennial that reproduces from seed and forms a new shoot each year from a taproot.



Comments: The most effective method of control is to prevent seed production and its establishment through responsible land management.

Biological control: Many biological control agents are used on Spotted Knapweed. The Sulfur Knapweed Moth (*Agapeta zoegana*) larvae feed within the plant's roots. The Knapweed Peacock Fly (*Chaetorellia acrolophi*) larvae feed on the plant's seeds. The Green Clearwing Fly (*Terellia virens*) larvae feed on seeds within flower heads of Spotted Knapweed. The Knapweed Root Weevil (*Cyphocleonus achates*) larvae feed within Spotted Knapweed roots. *Larinus minutus*, a Seedhead Weevil, larvae destroy Spotted Knapweed seed in the seedheads. *Larinus obtusus*, Blunt Knapweed Flower Weevil, larvae feed on seeds within the seedheads and adults feed on leaves. *Urophora affinis* and *Urophora quadrifasciata* are seedhead gall flies that are also used as biocontrol agents for Spotted Knapweeds

Chemical Control: Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Establish select grasses as an effective cultural control of Spotted Knapweed.

Mechanical Control: Dig when the soil is moist, and remove the entire taproot as well as all lateral roots. Moving Spotted Knapweed at full-bloom will stress the plant, but not kill it. Be sure to bag the flowering cut plants, since the seeds remain viable even after cutting.

19. YELLOW SWEET CLOVER (*Melilotus officinalis*)

Yellow Sweet Clover is a sweet-smelling herb in the pea family. It is native to Asia and Europe. It is an erect annual or biennial that grows from strong taproots, often growing in colonies. The stems are freely branched above, hairless or with sparse, fine, flat, stiff, very short hairs. The leaves alternate on the stems and each leaf is comprised of 3 leaflets arising from a distinct petiole. The leaflets are .5 to 1.5 inches long, with small, sharp teeth, almost hairless to finely flat-short-hair. The numerous yellow flowers grow in clusters, flowering from May to October. The fruit is produced in pods, usually with 1 seed. Seeds are dispersed by water and wind. They are drought tolerant and winter hardy, but cannot withstand prolonged flooding. This biennial reproduces by seed with each plant capable of producing over 100,000 seeds.



Comment: Yellow Sweet Clover is currently being considered for listing as a noxious weed in Colorado. It is a rapidly spreading weed in Crested Butte.

Biological Control: There are no biological controls for Yellow Sweet Clover.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Attempt to maintain competitive communities of desirable species. Re-seed any open ground with perennial grasses to prevent invasion by other weed species.

Mechanical Control: Hand-pulling is effective if done when the ground is moist and most of the root can be removed. The best times to hand-pull Sweet Clover are in the late fall, after the first-year plant root-crown buds have developed, or anytime early in spring, before second-year plants develop flower buds. Cutting first and second year stems close to the ground with a hand-held scythe is effective if done after leaves on the lower stems have died (before flowering occurs) and up to early stages of flowering (before seeds form). Sweet Clover usually does not re-sprout when the stems are cut close to the ground during this time.

20. YELLOW TOADFLAX (*Linaria vulgaris*)

Yellow Toadflax is a member of the Figwort family and is sometimes called Common Toadflax or “Butter and Eggs.” It was introduced from Europe as an ornamental and has now become a serious problem to rangelands and mountain meadows. It is a perennial reproducing from seed, as well as from underground rootstalk. The flowers are bright yellow with deep orange centers that resemble the Snapdragon. Yellow Toadflax does well in all types of soils. Its displacement of desirable grasses not only reduces ecological diversity, but also reduces rangeland value and can lead to erosion problems. Because of its early vigorous growth, extensive underground root system, and effective seed dispersal methods; Yellow Toadflax is difficult to control. Yellow Toadflax is prevalent in Crested Butte.



Comment: The key to effective control of Yellow Toadflax is prevention and integrating as many management strategies as possible. It is a rapidly spreading weed in Crested Butte.

Biological Control: One insect species *Calophasia lunula* a defoliating moth has been released on Yellow Toadflax. It may defoliate up to 20 percent of the leaves. The Toadflax Flower-feeding Beetle, *Brachypterolus pulcarius*, larvae feed on the reproductive structures within the flowers, including the seeds, and adults feed on young plant stems. The Toadflax Seed Capsule Weevil, *Rhinusa antirrhini* (formerly *Gymnetron*), larvae feed on immature seeds and adults feed on flowers and young shoots. Research at the Rocky Mountain Biological Laboratory has shown that biological control agents may reduce seed production, but have no effect on the survival of plants. Biological control is not currently encouraged because it is ineffective at reducing population sizes and it is not known if the insect herbivores will jump to native plants.

Chemical Control: Contact Crested Butte Parks and Recreation Department or a licensed applicator for specific recommendations.

Cultural Control: Attempt to maintain competitive communities of desirable species. Re-seed any open ground with perennial grasses to prevent invasion by other weed species.

Education: The key to management of Yellow Toadflax and other escaped ornamentals is to create an awareness among homeowners, nurseries, landscapers, and landscape architects that Yellow Toadflax is a noxious weed and therefore should not be specified in plantings, sold in nurseries or planted in home gardens or large-scale landscape projects.

Mechanical Control: Digging and pulling where feasible, can provide effective control of Toadflax if conducted annually for 10 to 15 years.

IV. How to distinguish Varieties of Thistle, Knapweed, and Toadflax

THISTLES

Four types of Thistles are on the Crested Butte Noxious Weed List. Canada Thistle is a perennial and has an extensive root system. Plumeless Scotch and Musk Thistles are biennials; they are relatively shallow rooted and reproduce by seed only. Canada and Plumeless Thistle are often mistaken for each other; however it is very simple to tell them apart. Canada has a smooth stem; Plumeless has spiny stems and leaves. The bracts under the flower of Canada are spineless; the bracts under the flower of Plumeless appear as sharp spines. The flowers of Musk Thistle are about three times larger than those of Canada or Plumeless. Musk Thistle seedlings have a very prominent white midrib. Scotch Thistle leaves are larger than those of the other Thistles. They grow up to 2 feet in length and 1 foot wide. The leaves are covered with dense hairs, which give them a gray appearance. All of the biennial Thistles may grow to heights of greater than six feet. Canada Thistle may grow from 1 to 4 feet tall. Colorado has several species of Thistle which are native and do not cause the problems of the noxious species. Native Thistles have mostly white, sometimes very pale lavender flowers and are more succulent than the noxious species. The flowers may have a hairy or fuzzy appearance and stems of some species are reddish.

KNAPWEEDS

Russian Knapweed is a perennial with an extensive underground root system. Spotted Knapweed is a biennial, or occasionally a short-lived perennial with a short taproot. Generally the flowers of spotted and Russian Knapweed are pinkish-purple; Diffuse flowers are white, however there are exceptions. The best way to distinguish between the Knapweeds is by the bracts. The bracts of Russian Knapweed are white and papery-thin. Diffuse Knapweed has sharp-toothed bracts. Spotted Knapweed bracts are more like a fringe (not as spiny) with a black spot on each bract.

TOADFLAX

The best way to distinguish the different Toadflaxes is to look at the shape of the leaves. Yellow Toadflax has narrow leaves that are pointed at both ends; the leaves of Dalmatian Toadflax are heart-shaped, clasp the stem, and are waxy with a blue green color. Yellow Toadflax tends to be a smaller plant than Dalmatian Toadflax.