

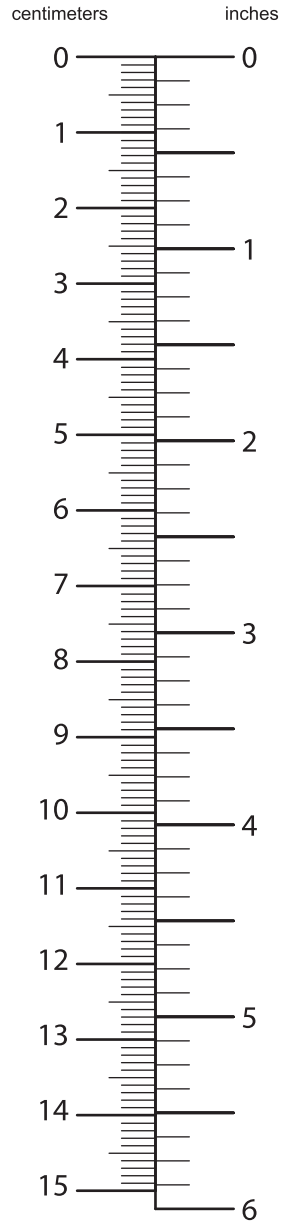


# Weed Management Reference Guide

**LARIMER COUNTY NATURAL RESOURCES**



## Actual Scale



## Acknowledgements

Guide compiled by Casey Cisneros and Maxine Guill

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Larimer County Department of Natural Resources  
7th Edition

Your comments, suggestions, and corrections are welcome! Contact the Larimer County Land Stewardship Program at (970) 498-5768.

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## About this guide

The purpose of this guide is to provide useful information about rangeland and pasture weed management in Larimer County to small acreage landowners, livestock producers, and other interested parties.

## This guide will provide:

- Identification descriptions and photos for select non-native plants within Larimer County. This weed list is not comprehensive of all weed species in Larimer County.
- A summary of herbicide characteristics and calibration steps (this information is not intended to take the place of herbicide label regulations).
- Common name, scientific name and plant family.
- Colorado noxious weed act designations for each species.
- Recommended options for best management practices.
- Known geographic distribution of each species.

An overview of the Larimer County Land Stewardship Program services, the Colorado Noxious Weed Act and other references for additional information.

## Land Stewardship Program Goals

- Early detection and monitoring populations of invasive species.
- Foster responsible land stewardship through education and outreach that promotes best management practices.
- Assist private and public land managers to minimize invasive species and promote resilient vegetation resources.
- Compel responsible parties to comply with state law for the management of invasive species.



## Larimer County Land Stewardship Program

Contact for retail sales, questions, or concerns:

Phone: 970-498-5768

Email: [DNR\\_WeedDistrict@larimer.org](mailto:DNR_WeedDistrict@larimer.org)

Website: [www.larimer.org/weeds](http://www.larimer.org/weeds)

Office address: (Please call ahead for appointment)

★ Larimer County Weed District

2649 East Mulberry #6

Fort Collins, CO 80524



## Land Stewardship Program Services

**Site Visits:** Staff are available to visit your property to identify weed issues and provide treatment recommendations using best management practices.

**Cost-Share Program:** Landowners within the Land Stewardship boundary can receive reimbursements towards the cost of weed management as funding allows.

**Herbicide Sales:** Sell herbicides for weed management on range, pasture and natural areas.

**Request a Speaker:** Staff are available to present on vegetation management to classes, clubs, homeowner associations and other groups with adequate notice. Call (970) 498-5768 to request a presentation.

**Do Not Spray Requests:** Request that Larimer County not spray the roadside adjacent to your property with herbicides. You must submit your request annually and are then responsible to manage any noxious weed issues within that rights-of-way.

### Visit [larimer.gov/weeds](http://larimer.gov/weeds) for:

- Recommendations on weed management
- The Larimer County Noxious Weed Management Plan
- Weed District boundary
- Lists of applicators, consultants, mowers and seed companies
- Help identifying a weed
- Reporting a noxious weed issue
- Additional resources

## Noxious Weed Law

The Colorado Noxious Weed Act declares that there is a need to manage undesirable plants as designated by the state of Colorado that present a threat to the continued economic and environmental value of the lands of the state and provide appropriate and available control and management methods, seeking those methods which are least environmentally damaging and which are practical and economically reasonable.

The Act prioritizes 79 noxious weed species into 4 lists: A, B, C, and a Watch List. The Act states that noxious weed management is the responsibility of local governing agencies: incorporated municipalities, counties and lands owned by state agencies. The Act stipulates that the Board of County Commissioners of each county in the state shall adopt a noxious weed management plan for all the unincorporated lands within the county.

The Larimer County Noxious Weed Management Plan was approved by the Larimer County Board of County Commissioners on November 20, 2018. Larimer County seeks landowner compliance with the Noxious Weed Act. The County will enforce the Act's provisions on non-compliant landowners.

- The Larimer County Noxious Weed Management Plan requires eradication of all List A species and infestations of certain List B species identified as regionally scarce by the state. The plan requires containment and suppression measures for List B species that are abundant in the county.
- Enforcement as outlined in the Larimer County Noxious Weed Management Plan cannot be enacted on private or public property without first applying the same measures to any land or rights-of-way owned or administered by the County that are adjacent to such properties.

# Noxious Weed Best Management Practices

A few keys to effectively managing weeds:

- Ensure that you have correctly identified the plant!
- Prevent seed production to deplete the soil seed bank.
- If plants have started to flower, bag and dispose of plants to prevent seed dispersal.
- An established stand of weeds cannot be completely controlled in one season, persistence is necessary.
- Understanding plant life cycles and growth stages is necessary to effectively manage weeds.



*Leafy spurge before treatment 2009*



*After herbicide treatment in 2014*



*The root growth of Canada thistle from 1 shoot after 14 months (with Dr. Westra, CSU researcher)*

# Prevention

The most cost-effective way to manage any noxious weed is to prevent weeds from establishing in the first place or to stop the spread of them.

- Do not drive equipment through infested areas. If you must, thoroughly clean air intakes, radiators, wheel wells, skid plates, axles, frame joints, engine block, CV boots, and every nook and cranny before leaving the weedy area.
- Do not graze livestock during periods when weeds are flowering or seeding.
- Always use certified weed-free hay.
- Avoid moving seed from weed-infested fields to non-infested areas. Seeds cling to hides, clothing and shoes. Mud on hooves, shoes and equipment can have weed seed in it.
- Utilize Early Detection and Rapid Response (EDRR). Minimize soil disturbance and control neighboring infestations quickly, before they become established.
- Avoid overgrazing.



# Biological Control

The use of living agents to reduce plant vigor and reproduction.

**Insects** that attack specific weed species can have fair results. The effects of these insects in suppressing infestations are more pronounced during drought or other environmental stressors. Insect releases are preferred in areas with large infestations that are difficult to access with other management techniques. Expect 3-5 years following release for establishment and impact on a target weed population. Insects and other biological agents can be used to suppress or minimize infestations but will not eradicate them. Insects and other



biocontrol agents are not appropriate for managing weeds that can be eradicated, such as List A or other high priority weed species. For more information on insects and other biocontrol agents, visit: <https://ag.colorado.gov/conservation/biocontrol>



**Livestock grazing** can provide suppression of some weed species, but results are no greater than what mowing would accomplish. Livestock may find some weeds unpalatable, and some of them are poisonous. When using livestock grazing for weed control, managers need to be mindful of the possibility of movement of weed seed from one site to another by way of manure dispersal or seed carried on hooves and fur. Repeated and intense grazing constitutes a disturbance itself, which can lead to an increase in weeds.



## Mechanical Control

The use of physical disruption to kill or suppress the plant. This method takes time, commitment and persistence.

**Hand-pulling or digging** can be effective for annual or biennial species. The top 3-5 inches of the taproot should be removed, or regrowth can occur. Some plants irritate the skin. Wearing leather gloves and a long-sleeved shirt is recommended. Perennial species with creeping roots are impossible to pull and will re-sprout. However, pulling and disposing perennial species stops plants from setting seed.



**Mowing** multiple times before or when plants start to flower can reduce seed production and stress the weeds, but some plants will flower at the mowed height. However, mowing only suppresses them and is not effective for eradication. The use of a weed whip can make this more selective than a larger mower.



**Shallow tillage** of annual or biennial plants can kill them if the root crown is not deep. For perennial plants tillage can be counterproductive. The root stalks can spread and re-growth is quick. This is not a selective treatment, all plants will be affected by this.



**Heat** from fire or steam damages plant tissues killing the plant. It is not effective on perennial weeds as they will use their root reserves to re-grow. The use of a torch can make this more selective than large scale burning. Desirable perennial grass species respond favorably to fire. Burn permits are required by the Larimer County Health and Environment Department.



## Chemical Control

The use of chemicals to kill plants. Proper herbicide application can be the most effective and time-efficient method of managing weeds. Selective herbicides target certain plants and leave others. To make non-selective herbicides more selective, spot spray only the plants you want to target. Several years of spraying are necessary for effective control.



## Cultural Control

The use of desirable, competitive vegetation to prevent or slow down invasion by weeds.

Irrigation, change in grazing and weed suppression practices are common methods to achieve desirable grasses in the recovery process without having to reseed.

If a site is so highly disturbed that recovery is not possible through weed management, then reseeding becomes necessary. Successful reseeding requires several years and many factors need to be considered prior to seeding. For more info consult the Native Plant Revegetation Guide for Colorado published by Colorado Parks and Wildlife Natural Areas Program at:

<https://cpw.state.co.us/aboutus/Pages/RS-Revegetation.aspx>.



# PLANT IDENTIFICATION LIST A



Photo © Jim Sebastian

# Cypress Spurge

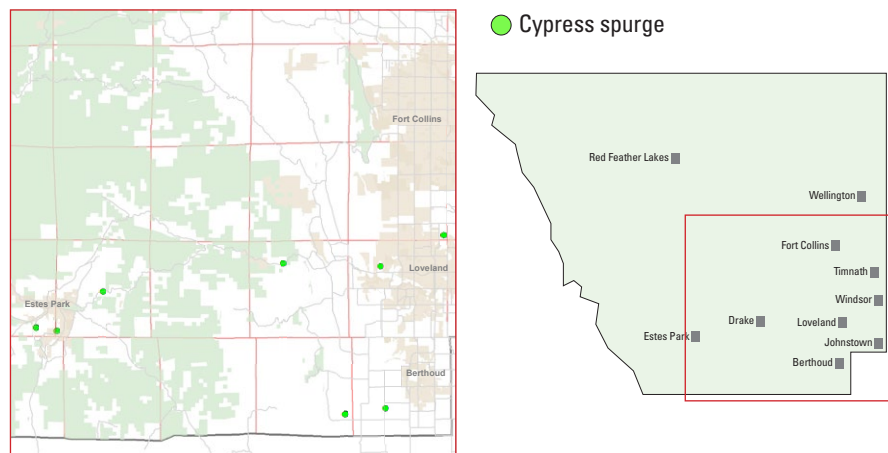
(*Euphorbia cyparissias*) Spurge Family

**LIST A** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



## Cypress Spurge

Cypress spurge is a perennial that reproduces by seed, spreading roots and vegetatively. Cypress spurge commonly occurs in dry to moderately moist meadows, pastures, forest edges, roadsides, rights-of-way, cemeteries, and gardens.

### Identification

- Mature plants are 4 to 32 inches high. Stems are hairless, and have many branches.
- Leaves are dark green linear, approximately 1/2 to 1 1/4 inches long and 1 to 2 mm wide. They are alternately arranged on the stem.
- Upper stem leaves that occur near the flowers are called bracts and are lime green in color.
- The stems and leaves contain a milky latex.
- The tiny flowers are yellowish-green usually turning reddish green towards maturity and are clustered in bunches at the ends of stems surrounded by the bracts.
- The three-capsuled fruits of cypress spurge explode at maturity, ejecting the seeds out about 15 feet.

### Life Cycle

Plants overwinter as seed or root. New shoots emerge or seeds germinate each spring soon after the snow cover melts. Flowering begins in May. Seeds may mature as early as the end of June. A second flowering often occurs in late summer or early fall. Can produce 900 seeds per plant. The dried up stems stay upright during the winter.

### Management

**Biological:** Grazing is not an option as its milky latex is toxic to livestock. There are no insect biocontrol agents available for this species.

**Mechanical:** Pulling or digging is effective, with proper caution to prevent skin or eye contact with the caustic latex present throughout the plant. Mowing is not practical because of the plant's low growth.

**Chemical:** Rangestar applied when it is flowering.

**The best management practice is to pull small infestations or spray Rangestar in May. If seeds are present they need to be bagged and disposed of.**





# Hairy Willow-Herb

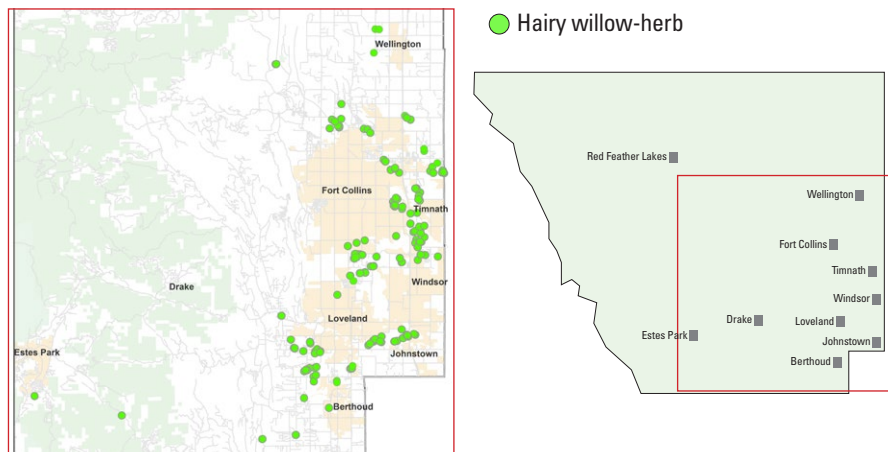
(*Epilobium hirsutum*) Evening Primrose family

**LIST A** Noxious Weed in Colorado

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## Larimer County Distribution Map



# Hairy Willow-Herb

Hairy willow-herb is a semi-aquatic perennial that forms monocultures that can crowd out cattails and clog waterways. It is found in riparian and wetland areas at lower elevations and reproduces by seed and vegetatively.

## Identification

- Mature plants are 3-6 feet tall.
- Entire plant is covered in soft hairs and stems are multi-branched.
- Leaves opposite, ½ inch wide and 2-4 inches long, lance-shaped with toothed edges, attached directly to the stem.
- Flowers are deep pink, single, ½-1 inch wide, 4-petaled, with a white style.
- Seeds with a white silky tuft in a long seed pod can be blown in the wind, and readily sticks to feathers, fur and clothing.
- Numerous native willow-herb species are in Colorado's wetlands. They are not hairy and have smaller flowers.

## Life Cycle

Plants overwinter as seed or root. New shoots emerge or seeds germinate in spring. Flowering begins in late June and continues through August. The plant can start producing seed a couple weeks after the flower emerges. Seeds are viable in the soil for up to 5 years. The plant breaks down during the winter.

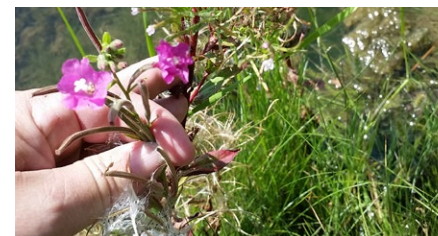
## Management

**Biological:** Grazing is not a viable option due to the aquatic habitat it grows in. Biocontrol agents are not a viable management option for List A species.

**Mechanical:** Pulling or digging can be effective for small infestations. Be sure all creeping roots are removed to prevent re-growth. Carefully bag and dispose of in the landfill.

**Chemical:** An aquatic labeled herbicide like Rodeo, Garlon 3A, or Arsenal needs to be applied in standing water. In seasonally dry areas Milestone can be applied. All need to be applied at the pre-bud to flowering stage.

**The best management practice is to wait until flowering when plants are most visible, cut and bag flowers and seed heads, then spot-spray the remaining portion of the plant with Garlon 3A.**



Hairy willow herb flower



Native flower

# Japanese Knotweed

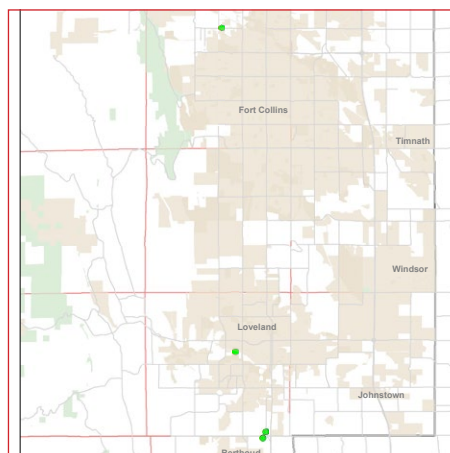
(*Fallopia japonica*) Knotweed family

**LIST A** Noxious Weed in Colorado

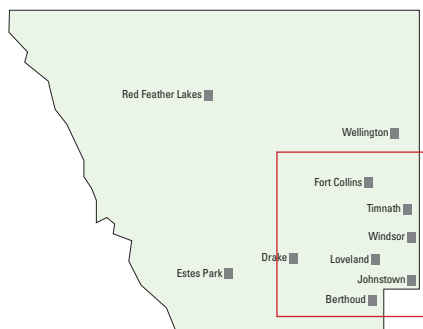
**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



● Japanese Knotweed



## Japanese Knotweed

Japanese knotweed is a bright green, bamboo-like perennial shrub that forms large thickets. It spreads through seeds and vegetative growth. It is an escaped ornamental; found in riparian areas, gardens, disturbed sites, old farms, and rights-of-way.

### Identification

- Mature plants can grow up to 16 feet tall.
- Stems are hollow, reddish, rigid and jointed. The base of the stem above the joint is surrounded by a membranous sheath.
- Leaves are alternate and large, 3-11 inches wide and 5-15 inches long, broadly ovate or spade-shaped.
- Flowers are greenish-white, 1/8 inch wide. In upright 4 inches, long multi-branched spike flowerhead.

### Life Cycle

Each year it re-sprouts at the ground level. Flowers in July-September. During the winter the dried up stocks break off and fall to the ground.

### Management

**Biological:** Biocontrol agents are not viable management options for List A species. Grazing early in the season can be effective at keeping the plants low to the ground but needs to be followed up with another method that will permanently get rid of the plant.

**Cultural:** Wait to re-seed the area until the allelopathic properties have dissipated in the soil.

**Mechanical:** Pulling or digging is not recommended.

**Chemical:** An aquatic labeled herbicide like Rodeo, Garlon 3A, or Arsenal needs to be used where water is standing. In dry areas Roundup, Garlon 4, or Milestone is effective. Rodeo or Roundup is the only herbicide that can be put in the hollow stems.

**The best management practice is to remove the plants to ground level and apply Rodeo (aquatic) or Roundup (non-aquatic) into the hollow stems or spray Garlon 3A (aquatic) or Milestone (non-aquatic) on the leaves when the plants are less than 3 feet from the ground.**



# Mediterranean Sage

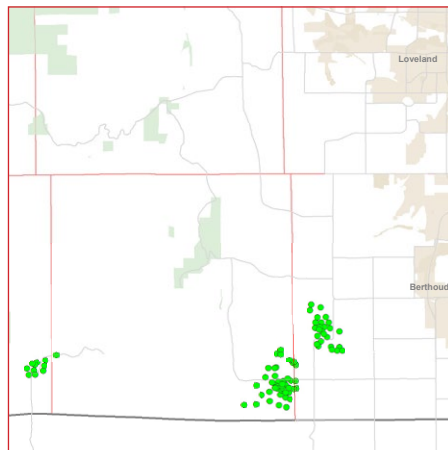
(*Salvia aethiopis*) Mint family

**LIST A** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



● Mediterranean sage



## Mediterranean Sage

Mediterranean sage is a biennial with a tough, sometimes woody, taproot that reproduces only by seed. It is an escaped ornamental. This weed usually becomes established in sparsely vegetated land, but will readily invade rangelands in good condition. It prefers well-drained soils and dry conditions.

### Identification

- Mature plants are 2-3 ft tall and are highly branched.
- It has a square stem, common to most plants in the mint family, and is covered with white hairs.
- Large leaves are covered with white woolly hairs that turn the leaf a grayish color. They are triangular, wrinkled, and irregularly lobed. Leaves have a pungent odor when crushed.
- It produces lots of showy, white flowers, on a 2-3 foot wide globe shaped flower head. Flowers are two-lipped, and yellowish-white in color.
- The rosettes can be confused with Lamb's ears (*Stachys byzantina*) and common mullein (*Verbascum thapsus*).

### Life Cycle

This plant produces a large rosette in the spring. The plant bolts and flowers by June. During the hottest part of the summer, the plant dries up, breaks off and forms a tumbleweed dispersing 100,000 seeds. If there is adequate moisture the seeds may germinate in the fall and over winter as a small rosette.

### Management

**Biological:** Grazing cannot be used because this plant is unpalatable to livestock. Biocontrol agents are not viable management options for List A species.

**Mechanical:** Pulling or digging is effective if enough of the root (3-4 inches) is removed to prevent re-growth. If flowering plants are manually removed, bagging and disposal is necessary to prevent seed dispersal. Mowing is not an effective means of control, as the plants readily re-grows.

**Chemical:** Dicamba, 2,4-D, Escort, Telar, Transline, and Milestone provide control at the rosette stage. A high quality surfactant needs to be added so the herbicide can penetrate the woolly leaves. Milestone will also provide some preemergence activity.

**The best management practice for control of scattered plants in small areas is hand pulling or digging. Flowering plants must be bagged. When manual removal is not feasible, an herbicide application of Milestone is most effective at rosette stage.**



# Myrtle Spurge

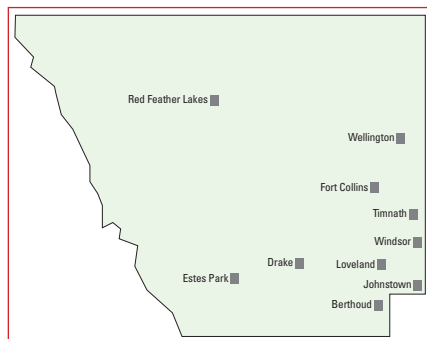
(*Euphorbia myrsinites*) Spurge Family

**LIST A** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



# Myrtle Spurge

Myrtle spurge is a low growing perennial that has a taproot and reproduces only by seed. This ornamental started out in backyard rock gardens and has escaped to disturbed ground, waste places and remote rocky locations. Myrtle spurge prefers dry to moist, well-drained soils, in partial shade to full sun.

## Identification

- Mature plants have a flattened growth structure, grows up to 8-12 inches high.
- Fleshy stems trail along the ground for up to 18 inches.
- Blue-green fleshy leaves clasp the stem in an alternate pattern.
- Upper stem leaves that occur near the flowers are called bracts and are lime green in color.
- The tiny flowers are yellowish-green clustered in bunches at the ends of stems surrounded by the bracts.
- Plants are capable of projecting seeds up to 15 feet away.

## Life Cycle

This plant produces new stems from a tap root each year. Yellow-green flower-like bracts appear in early spring. Plants flower from April to May. After setting seed the plant may turn brown and go dormant during the summer. Seed viability is estimated to be 8 years in the soil.

## Management

**Biological:** Grazing myrtle spurge is not an option as it is poisonous. There are no insect biocontrol agents available.

**Mechanical:** Pulling or digging is effective, with proper caution to prevent skin or eye contact with the caustic latex sap that is present throughout the plant. Mowing is not practical because of the plant's low growth structure.

**Chemical:** 2,4-D, with a good surfactant to penetrate the waxy leaf surface applied in early spring.

**The best management practice is to pull small infestations or spray 2,4-D in April/May. If seeds are present they need to be bagged and disposed of.**



# Orange Hawkweed

(*Hieracium aurantiacum*) Sunflower Family

**LIST A** Noxious Weed in Colorado

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## Orange Hawkweed

Orange hawkweed is a perennial plant that reproduces from runners, creeping roots, sporadic root buds, and seed. It grows in moist, shady, grassy areas and can be found along creeks, in meadows, and along rights-of-way.

### Identification

- Mature plants grow 10 to 20 inches in height.
- Dark green hairy leaves are found at the base of the plant. They are four to six inches in length, spatula-shaped and have finely toothed margins.
- Stems are bristly, nearly leafless and have a milky juice.
- Flowers are bright orange, between 1/2 to 1 inch wide with notched tips. They are grouped 5 to 35 flowers at the top of a slender stem and tend to close up when it is shady, making the plants difficult to see.
- Seedheads are very similar to dandelion seed heads and readily blow in the wind.
- There are native hawkweeds and the orange agoseris flower is similar.

### Life Cycle

The plants form rosettes in spring and early summer forming mats that prevent other plants from growing. It flowers in June-July. Each stem may produce thousands of seeds.

### Management

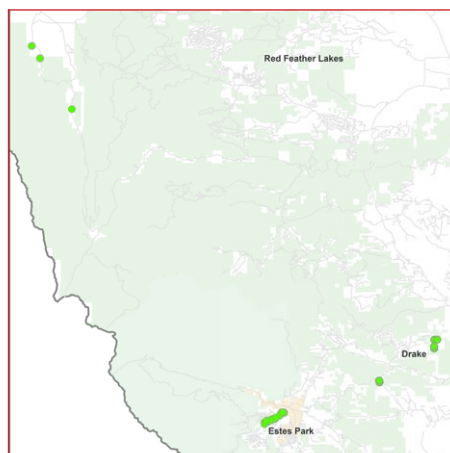
**Biological:** Grazing cannot be used because it is unpalatable to livestock. If found in hay, animals will not eat it. Insect biocontrol are not viable management options for List A species.

**Mechanical:** Mowing, pulling or digging is not advised as it promotes vegetative spread.

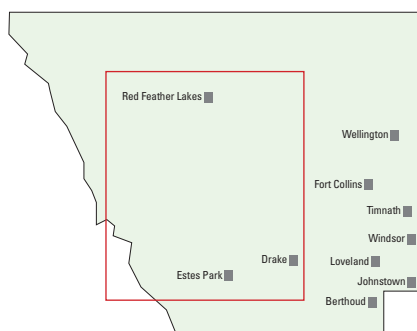
**Chemical:** Milestone and Transline can be used to control orange hawkweed.

**The best management practice is an application of Milestone prior to seed production. If seeds are present they need to be bagged and disposed of.**

### Larimer County Distribution Map



● Orange hawkweed



# Purple Loosestrife

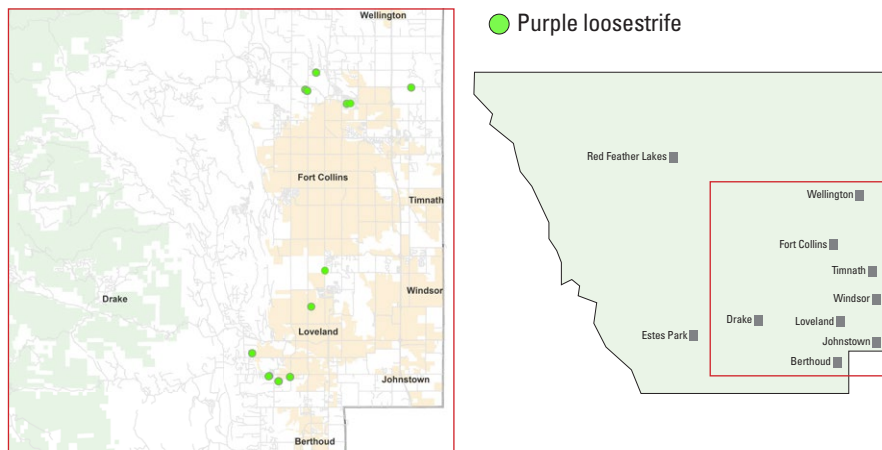
(*Lythrum salicaria*) Loosestrife Family

**LIST A** Noxious Weed in Colorado

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## Larimer County Distribution Map



## Purple Loosestrife

Purple loosestrife is a wetland woody sub-shrub that is an escaped ornamental with a taproot. Purple loosestrife reproduces primarily by seed but pieces of roots or stems also can produce new plants. Purple loosestrife usually occurs in marshes, wet meadows, ditches, stream margins, shallow ponds, shores of lakes and wetlands.

### Identification

- The erect, square stem can be smooth to hairy, multi-branched and 1-1/2 to 8 ft tall. Plants become taller and bushier over the years as the rootstock matures.
- The leaves are lance shaped, entire, and are whorled.
- Flowers are pinkish-purple in color, about one inch long, have five to seven petals, and are arranged in long vertical heads. They bloom from the bottom up.
- The seeds are in a spiraling row of dark-brown seed capsules.
- Sometimes confused with fireweed (*Epilobium spp.*), which have 4-petaled flowers.

### Life Cycle

Stems arise from a perennial rootstock in spring. Flowers appear from late June through September. Seeds do not drop from capsules until the air temperature becomes cold in the early fall. A single flowering stalk can produce 300,000 seeds and remain viable in the soil for up to 20 years. During the winter the stalks break off.

### Management

**Biological:** Insect Biocontrols are not an appropriate method of eradication for List A noxious weeds in Colorado. Grazing is not feasible due to its wetland location and is unpalatable.

**Mechanical:** Pulling or digging is only effective if all the rootstalk is removed. Mowing is impractical due to growing in wetlands.

**Chemical:** An aquatic labeled herbicide like Rodeo, Garlon 3A, Arsenal and Clearcast control purple loosestrife. Rodeo and Arsenal are nonselective and will kill anything that is sprayed.

**A best management practice is to wait till the flowering stage when plants are most visible, then cut and bag seed heads and spot-spray the remaining portion of the plant with Rodeo or Garlon 3A.**



# Yellow Starthistle

(*Centaurea solstitialis*) Sunflower Family

**LIST A** Noxious Weed in Colorado

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Photo © Steve Dewey

## Larimer County Distribution Map

Known populations in Larimer County are currently considered eradicated. However, new infestations can occur.



## Yellow Starthistle

Yellow starthistle is an annual with a taproot that reproduces only by seed. It invades rangelands, pastures, roadsides, cropland, and wastelands but is intolerant of shade.

### Identification

- Mature plants grow 3-24 inches tall, with a winged stem and gray-green color with multiple branches.
- The stems and leaves are covered with cottony white hairs creating a grey appearance.
- Basal leaves are 1-3 inches long, silvery-green and deeply lobed. Upper leaves are smaller and narrow.
- The flowers are bright yellow and dandelion-like located singly at the ends of branches. At the base of the flower there are distinctive straw-colored spines, which are up to 0.75 inches long.
- The seed head is dandelion-like.
- Old plants that have shed their seeds leave a white cotton ball where the flower was.

### Life Cycle

Seedlings start to appear in June but can come up throughout the growing season after any rain storm. The flowers appear in July through October. Plants usually produce 700 – 1,000 seeds per plant. Seeds may remain viable for several years in the soil.

### Management

**Biological:** Biocontrols are not an appropriate method of eradication for List A noxious weeds in Colorado. Grazing is not advisable because it causes a neurological disorder called chewing disease in horses and is poor forage quality for all livestock.

**Mechanical:** Pulling or digging can be effective for small infestations, as long as flowering plants are bagged and disposed of. It will need to be done every 2-4 weeks during the growing season, especially after a rainstorm. Mowing is not advisable as it will stimulate additional flowering.

**Chemical:** Milestone or Transline will control yellow starthistle when applied at the rosette to bud stage. Milestone and Transline has post and pre emergent activity.

**The best management practice is to pull small populations. For larger populations, spray the area with Milestone before it flowers. If seeds are present they need to be bagged and disposed of.**



A high-angle, close-up photograph of a dense field of small, white, four-petaled flowers. The flowers are arranged in numerous small, upright clusters. The green leaves and stems are visible between the flower clusters, creating a textured, layered appearance. The overall scene is bright and natural, suggesting a meadow or a similar outdoor setting.

PLANT IDENTIFICATION  
**LIST B**



# Absinth Wormwood

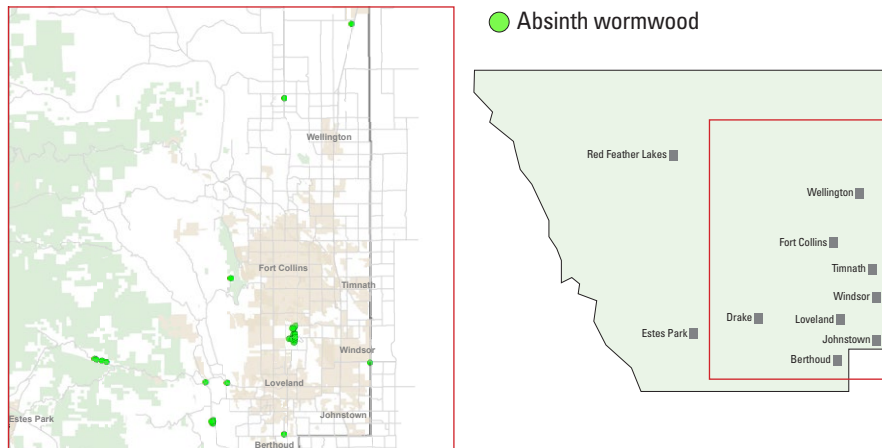
(*Artemisia absinthium*) Sunflower Family

**LIST B** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



# Absinth Wormwood

Absinth wormwood is a perennial with a taproot that has been used as a medicinal herb. It reproduces by seed and root fragment. Found along roadsides, pastures, and waste grounds.

## Identification

- Mature plant is 3-5 ft tall with 20 or more stems growing from a woody crown.
- The whole plant is covered with fine silky hairs, has a strong medicinal sage odor and a bitter taste.
- Leaves are divided into deeply lobed leaflets, light green to olive green color, 2-5 in long.
- Flowers are small, yellow, inconspicuous, and numerous; arranged in a large spike flowerhead.
- Each flower produces one seed, 1/16 in long, smooth, flattened and light gray-brown in color.
- May release allelopathic chemicals into the soil that prevent other plants from growing nearby.

## Life Cycle

Each year the plant regrows from the soil level in the spring. Flowering occurs in late July – August. Seeds are viable for 3-4 years in the soil.

## Management

**Biological:** Grazing is not a viable management option for EDRR species. It is not palatable to horses and taints the milk of cows. No biocontrol agents available.

**Mechanical:** Pulling or digging is only effective if all the rootstalk is removed. Remove when the soil is moist. If flowers/seeds are present they need to be bagged and disposed of. Mowing before flower will prevent seed production but needs to be combined with another control measure to be eradicated.

**Chemical:** Milestone or Transline herbicides provide control.

**The best management practice is to apply Milestone in the spring once new vegetation has grown above ground.**



# Black Henbane

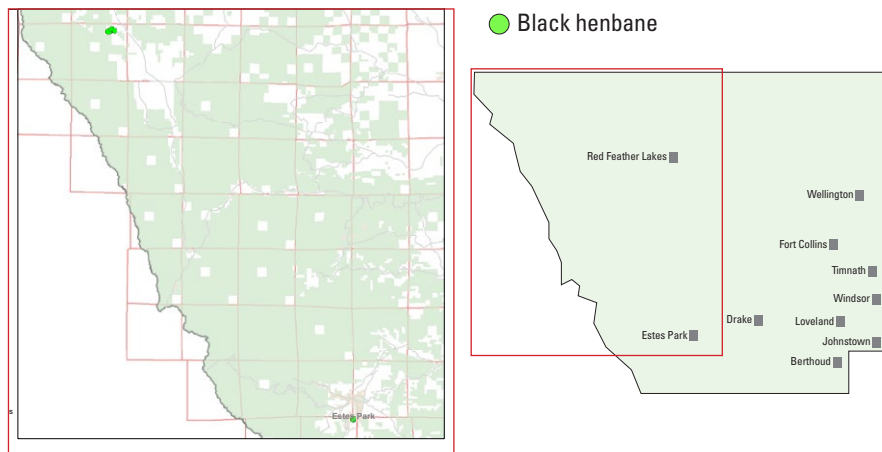
(*Hyoscyamus niger*) Nightshade Family

**LIST B** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



# Black Henbane

Black henbane is an annual or biennial escaped ornamental or medicinal herb with a taproot. It reproduces by seed by seed only and is found on disturbed or heavily grazed sites found in pastures, fence rows, roadsides, waste places, and riparian areas.

## Identification

- Mature plants are coarse, hairy, and 1-3 feet tall.
- The whole plant has a pungent, foul odor.
- The large rosettes have serrated leaves that are covered with fine hair. Prior to flowering, this plant looks very similar to thistle.
- Leaves are alternate, coarsely toothed to shallowly lobed and hairy.
- Flowers bloom in long spike-like clusters with the newer flowers at the tip. They are brownish-yellow with a purple center and purple veins.
- Two rows of pineapple shaped fruits approximately 1 in long, are five-lobed. Each fruit capsule contains hundreds of tiny seeds.

## Life Cycle

The plant usually emerges in May. It flowers from June to September, with peak flowering usually in July. With seeds appearing in the fall.

## Management

**Biological:** Grazing should not be considered because black henbane is poisonous to livestock. However, because of the foul odor of the plant, livestock will seldom graze it. No biocontrol agents available.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Gloves should be worn as it is poisonous to humans if ingested. Mowing before flower will prevent seed production but needs to be combined with another control measure to be eradicated.

**Chemical:** 2,4-D, Dicamba, Telar or Escort provide control. 2,4-D and dicamba need to be applied early before plant bolts. If the plant has already bolted then Telar or Escort should be used.

**The best management practice is to apply Telar before flowering.**



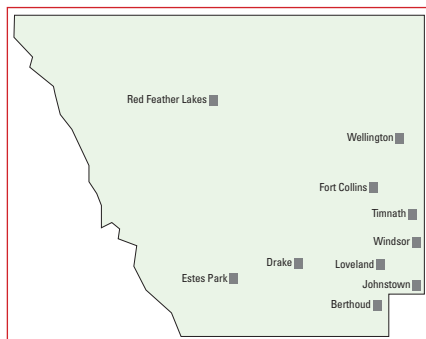
# Bull Thistle

(*Cirsium vulgare*) Sunflower Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



# Bull Thistle

Bull thistle is a biennial with a taproot. Reproduces by seed only. Grows in wet, shaded areas including pastures, overgrazed rangeland, roadsides, and logged areas.

## Identification

- Mature plants are 2-5 feet tall and can be branched.
- Leaves are clasping, deeply lobed, spiny and extend down from the attachment point to the node below, with hairs that are short and rough.
- Flowers are pinkish to dark purple in color, 1½ to 2 inches in diameter clustered at the ends of branches. The flower bracts are gumdrop-shaped and covered with spines.
- Seeds are capped with a circle of plume-like white hairs. Mature plants can produce up to 4,000 seeds per plant.
- Can be easily confused with musk thistle.

## Life Cycle

Germination occurs in early spring, late summer or early fall. Newly emerged plants over-winter in a rosette stage, bolt, then flower in July through September. From mid-summer into fall seeds are produced. Seed viability can last up to 10 years in the soil.

## Management

**Biological:** Grazing can reduce seed production. Horses will eat the young plants, goats only eat flowerheads and cattle will not eat it at all. No biocontrol agents available.

**Mechanical:** Mowing can provide suppression, but plants often re-grow and set seed from a reduced height. Needs repeated mowings. Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** For plants close to the flowering stage Milestone, Transline, Telar will kill the plants and also have residual activity to prevent seedlings coming up the next year. 2,4-D, Escort, Dicamba and Garlon only works on the rosette.

**Best management practice is to apply Milestone prior to flowering.**



# Canada Thistle

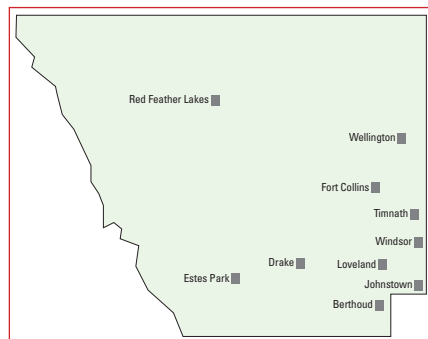
(*Cirsium arvense*) Sunflower Family

**LIST B** Noxious Weed in Colorado



Photo © Huggins

## Larimer County Distribution Map



## Canada Thistle

Canada thistle is a deep-rooted perennial that spreads by seeds and aggressive creeping, horizontal roots. Easily adaptable, it grows in nearly every habitat; crops, pastures, rangelands, roadsides, and riparian areas but mainly invades disturbed areas.

### Identification

- Mature plants range from 2-6 ft tall.
- Rosettes have spiny-tipped, wavy leaves.
- Leaves are spiny, alternate, oblong or lance-shaped with shallow lobes and wavy margins.
- Flowers are white to purple and borne in clusters of 1-5 per branch. They are about 3/4 in wide, tubular shaped with bracts that are spineless. Flowers have only female or male parts, not both.
- Seeds are attached to a cotton-like material, and dispersed by wind. A female Canada thistle plant averages about 1,500 seeds/plant.
- The native Flodman's thistle and Cainville thistle are similar in appearance as Canada thistle.

### Life Cycle

Shoots emerge between March and May. Stems elongate and flowering occurs June through October. Seeds mature July to October and can remain viable in soil for up to 20 years.

### Management

**Biological:** Grazing can prevent or slow down seed production and dispersal, but plants will quickly re-grow with no further management action. It is considered mildly toxic. Biocontrol rust fungus (*Puccinia punctiformis*) has proven to be somewhat effective.

**Mechanical:** Pulling or clipping reduces seed production, but otherwise is ineffective. If flowers/seeds are present they need to be bagged and disposed of. Tillage is counterproductive, re-growth is quick and every piece of the root system is capable of forming a new plant. Mowing before the flowering stage provides suppression, depletes the root reserves resulting in a less aggressive plant. Needs to be repeated multiple times a year for multiple years.

**Chemical:** Milestone, Perspective, Transline and Tordon all provide control. Dicamba, Telar, 2,4-D and combinations of these products provide suppression but not long-term control.

**The best management practice is an application of Milestone when the plant is green and growing vigorously. This needs to be repeated for several years.**



Photo © Dr. Phil Westra

# Chinese Clematis

(*Clematis orientalis*) Buttercup Family

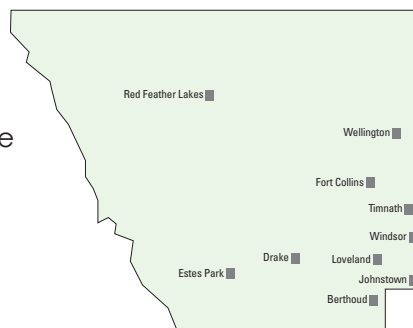
**LIST B** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map

Currently only found inside Loveland City limits.



## Chinese Clematis

Chinese clematis is an escaped ornamental, perennial woody vine that has long fibrous roots. It reproduces by seed only. Found in landscaped areas and along creeks, right-of-ways, and on rocky cliffs.

### Identification

- Mature vines grow up to 12 feet.
- Leaves are opposite with 3 leaflets.
- Solitary flowers have four yellow petals, 1 to 2 inches wide, nodding.
- Each flower produces numerous feathery, long-tailed fruits which are conspicuous all winter.
- Looks like the native, virgin's bower (*Clematis ligusticifolia*).

### Life Cycle

The plant flowers from July to September.

### Management

**Biological:** No biocontrol agents available.

**Mechanical:** Continual pulling works best when soil is moist. Wear gloves because the sap causes blisters. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Milestone, Plateau and 2,4-D will provide control. Milestone provides some residual.

**The best management practice is to remove the large plant before it flowers and then spray the short regrowth with Milestone.**



# Common Tansy

(*Tanacetum vulgare*) Sunflower Family

**LIST B** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Common Tansy

Common tansy is an escaped ornamental perennial plant with extensive woody creeping roots. Reproduces mostly by seed. Found along roadsides, stream and irrigation ditch banks, in disturbed areas, ornamental beds and in pastures.

### Identification

- Mature plants are 1.5 to 7 ft tall. Stems are stiff, ribbed, branched towards the top, hairless, and may be purplish-red to green in color.
- Leaves are alternate, deeply lobed like a fern with glands appearing on the surface and when crushed there is a strong odor.
- It has numerous yellow button-like flowers that lack petals, arranged in a flattened cluster at the top of the plants.
- Seeds are yellowish brown achenes with what looks like a short, five-toothed monarch crown. They can float.
- One plant can produce 50,000 seeds!
- Can be confused with yarrow and poison hemlock.

### Life Cycle

Flowering starts in July lasting through September. Seed viability is 2 years in the soil.

### Management

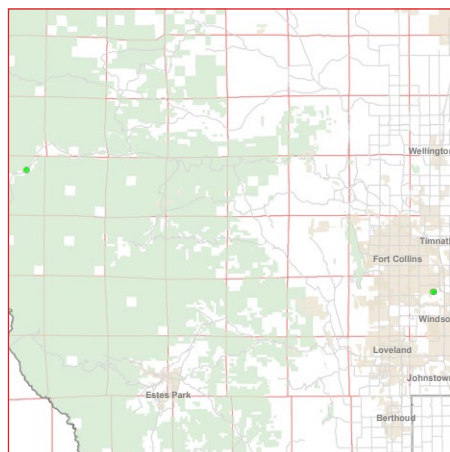
**Biological:** No biocontrol agents available. Grazing is not an option as the plant is toxic to cattle and is very unpalatable.

**Mechanical:** Mowing before flower will prevent seed production but needs to be combined with another control measure to be eradicated. Pulling or digging is not effective because of the extensive root system. The oils this plant produces can cause skin irritation, so wear gloves.

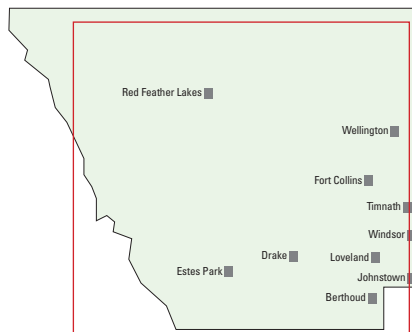
**Chemical:** Milestone, Transline, Telar, or Escort applied at bud stage.

**The best management practice is to apply Milestone in July. If flowers/seeds are present they need to be bagged and disposed of.**

### Larimer County Distribution Map



● Common tansy



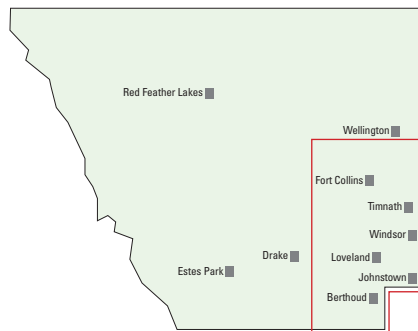
# Common Teasel

(*Dipsacus fullonum*) Teasel Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Common Teasel

Common teasel is a biennial or sometimes a short-lived perennial ornamental plant with a shallow taproot. It reproduces by seed only. Found along irrigation ditches, wetlands, abandoned fields, pastures, waste places, and forests.

### Identification

- Mature plants can grow up to over six ft tall.
- The stem is rigid, furrowed (straight-angled), with several rows of downward turned spines.
- Rosette leaves are dark green, with a prominent midvein, stiff spines on the lower midrib and appear to be wrinkled.
- Stem leaves are simple, opposite, net-veined, stalkless, and clasp the stem.
- The flowers are purple or white and are seated within a dense woody flower head. The flower head is generally egg-shaped, has a square base with spiny, awned bracts at the base that are longer than the head.
- The fruits are a four-angled achene, each containing a single seed. It can produce more than 2,000 seeds per plant.
- The heads of a cultivated variety of teasel are used for wool “fleeing”, or raising the nap on woolen cloth.

### Life Cycle

Plants germinate in late summer or early fall, over-winter in a rosette stage, bolt and flower in the spring or early summer. Flowering occurs from July to August. After flowering and seed set, the plant dies. The seed remains viable for at least two years in the soil.

### Management

**Biological:** No biocontrol agents available. Grazing is not an option as it is unpalatable and is generally ignored by livestock.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year after significant rain events. If flowers/seeds are present they need to be bagged and disposed of. If it is not too wet, mow before flowering to prevent seed production but plants will re-grow and set seed from a reduced height.

**Chemical:** The plant should be sprayed at the rosette stage. In dry areas Milestone, Transline, dicamba, Escort, Telar, and Plateau can be used. Milestone can also be used up to the water's edge and an aquatic labeled 2,4-D can be used in water.

**The best management practice is to apply Milestone on the rosettes.**



# Dalmatian Toadflax

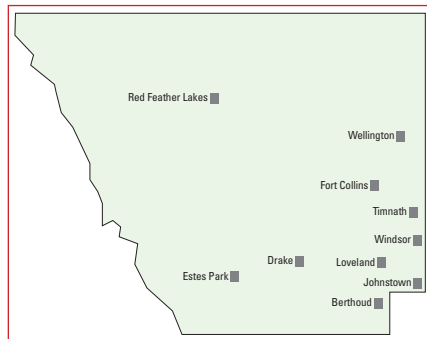
(*Linaria dalmatica*) Figwort Family

(*Linaria genistifolia*) Figwort Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



# Dalmatian Toadflax

Dalmatian toadflax is an escaped ornamental perennial with a deep, extensive root system. Reproduces both by seed and by extensive, creeping roots. Well adapted to semi-arid sites and is most commonly found along roadsides, fences, rangelands, croplands, clear cuts, and pastures.

## Identification

- Mature plants produce multiple stems at the base that grow to 3 feet tall. The stems are thick-walled and somewhat woody.
- The leaves are alternate, heart-shaped, blue-green, with a thick waxy cuticle, and clasp the stem.
- Has bright yellow snapdragon-like flowers with an orange throat arranged on elongated racemes.
- Fruits are round capsules with many seeds inside. Seeds are sharply angular, and slightly winged.
- A single plant produces 500,000 seeds.
- Yellow toadflax (*Linaria vulgaris*) is similar in appearance, but has more linear pointed leaves, and is generally a smaller plant.

## Life Cycle

Spring emergence occurs about mid-April. The plant stems elongate and flowering occurs from May-August and seeds mature from July-September. The plants produce flowers throughout the summer before taking on a dry, wilted appearance in the fall. In September, short stems emerge and produce egg-shaped leaves. These stems are tolerant to freezing. Seeds are viable in the soil for at least 10 years.

## Management

**Biological:** The biocontrol insect *Mecinus janthiniformis*, a stem-boring weevil, will reduce the vigor of the plant. Grazing is not advised as it is toxic to livestock and generally considered unpalatable.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year for several years. If flowers/seeds are present they need to be bagged and disposed of. Mowing before flowering will prevent seed production but stimulates regrowth.

**Chemical:** An early spring or fall application (when new growth appears at the plant base) of Telar with a surfactant of methylated seed oil, provides effective control.

**The best management practice is to apply Telar in early spring or fall on new growth. In really hard to reach areas the biocontrol insect works well to maintain the site.**



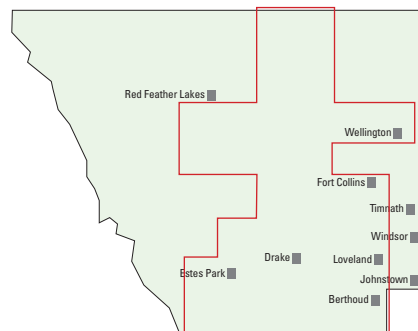
# Diffuse Knapweed

(*Centaurea diffusa*) Sunflower Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Diffuse Knapweed

Diffuse knapweed is a non-native biennial with a taproot. Reproduces solely by seed. Thrives in dry rugged terrain, disturbed areas, rights-of-way and overgrazed rangelands.

### Identification

- Mature plants grow 1 to 3 feet tall usually in a ball-shape that breaks off into a tumbleweed.
- First-year rosette is low lying with finely divided leaves and covered with fine hairs. The leaves on the stems are small, and are reduced in size near the flowering heads.
- Buds are urn-shaped at the ends of branches with rigid spines forming comb-like bracts.
- Flowers are mostly white, sometimes purple.
- Diffuse knapweed can produce up to 18,000 seeds per plant.
- Can resemble spotted knapweed and can hybridize with it.

### Life Cycle

A rosette sprouts in spring or fall. During the second year in mid to late spring the stem bolts. Flowers bloom July through August. Seed usually occurs by mid-August. The plant then dries up, breaks off at ground level and becomes a tumbleweed which disperses the still viable seeds over long distances. Seeds remain viable in the soil for 15 years.

### Management

**Biological:** Two insect biocontrol agents, a seed head weevil (*Larinus minutus*) and root weevils (*Cyphocleonus achates* and *Sphenoptera jugoslavica*) can provide some control. Grazing can suppress infestations.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Wear gloves, the plant can cause a rash. Mowing before flowering can reduce seed production and prevent plants from blowing and dispersing seed, but needs to be done multiple times a year.

**Chemical:** Milestone is effective when applied at the rosette to pre-bud stage. Transline is effective when applied at the pre-bud through flower.

**The best management practice is to apply a combination of Milestone + Transline at the bud stage**



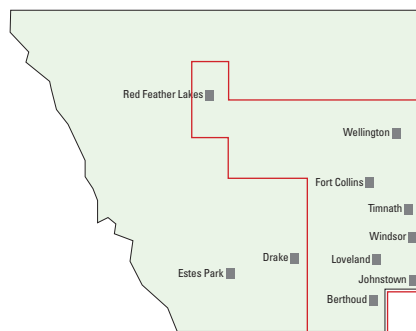
# Hoary Cress

(*Lepidium draba*) Mustard Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Hoary Cress

Hoary cress, commonly known as whitetop, is a perennial with creeping roots. Reproduces by seed and spreads vigorously by creeping roots. Typically found on unshaded, disturbed ground in fields, waste places, meadows, pastures, croplands, and roadsides.

### Identification

- Mature plants are up to 2 ft tall with erect stems.
- The leaves are alternate, grayish-green, lance-shaped with blunt ends and 3/4 to 4 inches long. The upper leaves have 2 lobes that clasp the stem.
- Numerous white flowers with four petals, give the plant a white, flat-topped appearance.
- Seed capsules are heart shaped, and contain two reddish-brown seeds. One plant can produce 1,200 to 4,800 seeds.

### Life Cycle

The plants emerge in early spring with stems emerging from the center of each rosette in late April. Hoary Cress flowers from May to June and plants set seed by mid-summer. Seeds are viable in the soil for three years.

### Management

**Biological:** Grazing with sheep or goats in the seedling stage can be used for suppression. It is toxic to cows. No biocontrol agents available.

**Mechanical:** Mowing before flowering can provide suppression but plants often re-grow and set seed from a reduced height. Pulling can provide suppression but because of the extensive root system the plant will regrow. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Escort, Telar and Clearcast (inside ditches) provide control when used in the spring at the flowering stage.

**The best management practice is an application of Telar at the flowering stage.**



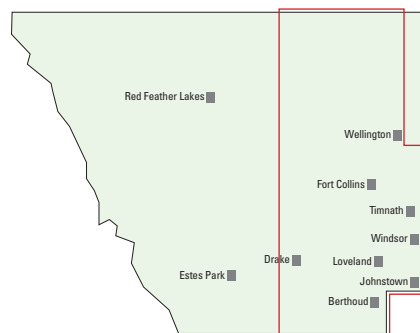
# Houndstongue

(*Cynoglossum officinale*) Boraginaceae Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Houndstongue

Houndstongue is a short-lived perennial or biennial with a thick, black, woody taproot. It reproduces by seed only. Grows on rangeland, pastures, abandoned cropland, roadsides, waste places and likes disturbed sites.

### Identification

- Mature plants are 1-4 ft tall with stems that are erect, stout, heavy.
- Leaves are green, alternate, oblong, rough, hairy, have a smooth edge and no teeth or lobes. Leaves often appear dusty and insect-ridden.
- Flowers are reddish-purple with five petals that droop slightly from densely clustered flowerheads. At the base of each flower are five leaflike parts that are covered with long, soft white hairs.
- Four seeds are produced per flower, about 1/3 in long and are Velcro-like, attaching to clothing and animals.
- One plant can produce up to 2,000 seeds.

### Life Cycle

Plants germinate in summer/fall, and over-winter as rosettes, bolts in the spring, flowers in mid-summer and seeds by fall. Seeds remain viable in the soil for 2-3 years.

### Management

**Biological:** Grazing cannot be used as the plant contains alkaloids that can lead to permanent liver disease and photosensitization when consumed in hay. Sheep are more resistant to houndstongue poisoning than cattle or horses. The burs may reduce the value of wool. No biocontrol agents available.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Mowing before flower will reduce seed production but needs to be done frequently.

**Chemical:** Dicamba, Escort, Telar, 2,4-D, and Plateau can control Houndstongue.

**The best management practice is to dig random plants or small patches. For larger areas an application of Telar in the spring before bolt.**



# Leafy Spurge

(*Euphorbia esula*) Spurge Family

**LIST B** Noxious Weed in Colorado



## Leafy Spurge

Leafy spurge is a perennial that has extensive, creeping roots. It reproduces by seeds and underground shoot buds. It occurs in rangeland, pastureland, woodland, prairies, roadsides, streams and ditches, and waste sites.

### Identification

- Mature plants can grow from 1 to 3 feet in height. The stems are smooth, hairless, pale green, and thickly clustered.
- The entire plant contains white, milky sap that exudes readily upon a stem or leaf breakage. The sap can damage eyes and sensitive skin.
- Leaves are alternate, narrow, linear, and 1 to 4 inches long.
- Flowers are yellowish-green, small, arranged in numerous small clusters and with heart-shaped yellow-green bracts below.
- Three-sided seed capsules explode when ripe and project the seeds up to 15 feet away from the parent plant. Plants can produce up to 130,000 seeds a year. Seeds float on water, and can be transported and deposited by flood water.
- The roots are brown and contain numerous pink buds.

### Life Cycle

Leafy spurge is one of the earliest plants to emerge in the spring. Flower clusters develop mid-April to June. Seeds mature about 30 days following pollination. Seeds remain viable in the soil for 5-8 years.

### Management

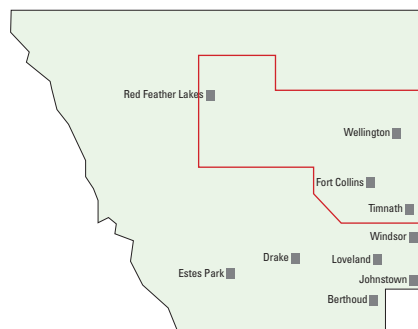
**Biological:** Sheep and goats can be trained to graze it. Cattle avoid eating it as it is poisonous to them. The insect biocontrol flea beetle (*Apthona spp.*) can be effective in reducing stands of leafy spurge in some sites, but not all.

**Mechanical:** Mowing is effective in depleting root reserves. Pulling or digging can reduce seed production and stress plants, but will readily grow back. If flowers/seeds are present they need to be bagged and disposed of. Gloves should be worn while coming into contact with this plant.

**Chemical:** Quinstar provides the best control with little or no grass injury. Plateau is fairly effective but can injure cool season grasses such as smooth brome.

**The best management practice is to apply Quinstar in the spring when in flower.**

### Larimer County Distribution Map



# Musk Thistle

(*Carduus nutans*) Sunflower Family

**LIST B** Noxious Weed in Colorado

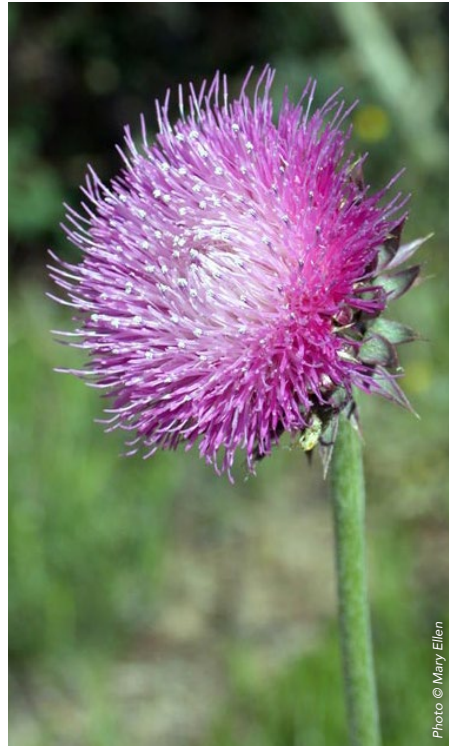
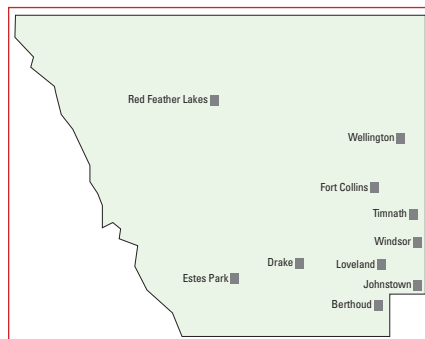


Photo © Mary Ellen

## Larimer County Distribution Map



Photo © Jim Selasney



# Musk Thistle

Musk thistle, or nodding thistle, is a biennial with a taproot. It reproduces by seed only. Easily adaptable, it grows in nearly every habitat up to 9,000 feet in elevation.

## Identification

- Mature plants can grow as tall as 8 feet with solitary or several stems from one base, and are highly branched above.
- Leaves are alternate, dark green, somewhat lobed and wavy, white outlined margins with spines and a prominent, light green mid-vein on the leaf. Leaf base extends down the stem from the point of attachment.
- Flowers are 1-1/2 to 2-1/2 inches across, purple, occasionally white, surrounded by broad, pinecone-like bracts appear singly on the end of stalks. Flowering heads often tilt to one side or downwards (hence “nodding”).
- One-seeded oblong fruit, about 0.2 inches long, shiny, yellowish-brown with white hair-like bristles. Average productivity is approximately 10,000 seeds/plant.
- Appears similar to plumeless thistle (*Carduus acanthoides*).

## Life Cycle

Seeds germinate in the fall or spring, forming a rosette. It bolts the following spring between April-June. Flowering occurs from May through mid-July. Seeds mature and are dispersed by the wind 1 to 3 weeks after flowering and may remain viable in the soil for at least 10 years.

## Management

**Biological:** Two insect biocontrol agents have been released for control of musk thistle: *Rhinocyllus conicus*, a seed-head feeding weevil and the crown feeding weevil *Trichosirocalus horridus*. *R. conicus* weevils had unintended impacts on native thistles and are no longer released; they are present throughout Colorado. Grazing can provide suppression, but plants often re-grow and set seed from a reduced height.

**Mechanical:** Mowing can provide suppression but plants often re-grow and set seed from a reduced height. Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Milestone, Transline, and Telar can provide effective control when applied at the rosette in the fall or spring to early bolt stage.

**The best management practice is to apply Milestone in the spring to the whole area where rosettes are found.**

# Oxeye Daisy

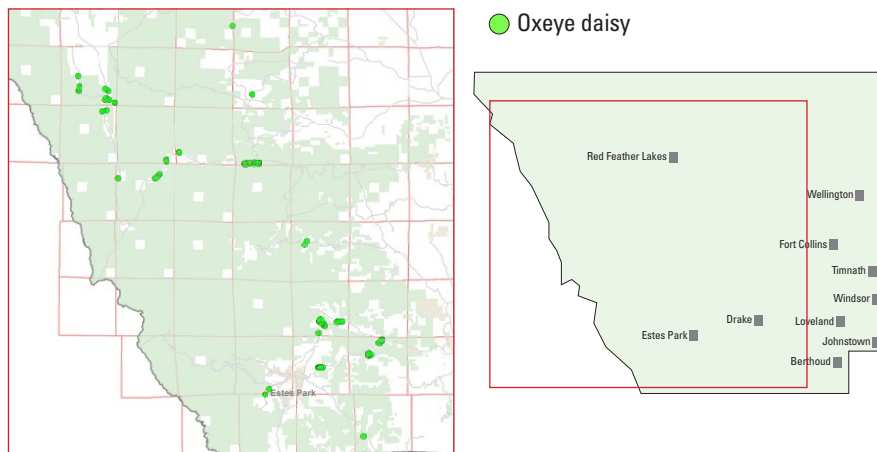
(*Leucanthemum vulgare*) Sunflower Family

**LIST B** Noxious Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



## Oxeye Daisy

Oxeye daisy is an escaped ornamental, short-lived perennial with shallow creeping roots. Reproduces vegetatively from roots, root fragments, and by seed. Found at higher elevations in meadows, pasture, rangeland, along roadsides, around mines and in waste places.

### Identification

- Mature plants are 10-24 in tall with erect, smooth to sparsely hairy stems.
- The basal and lower leaves are 2-5 in long, spoon shaped, toothed with long leaf stems. The upper leaves are alternate, narrow, toothed and clasp the stem and become progressively smaller upward along the stem.
- Daisy-like flowers are 1 to 3 inches in diameter, solitary at the ends of branches, have 15 to 30 white ray flowers and yellow disk flowers. The phyllaries beneath the flower head are green with a dark brown margin.
- Fruits have about 10 ribs. One flowerhead can produce up to 200 seeds.
- Easily confused with the ornamental Shasta daisy (*Chrysanthemum maximum*), which is a more robust plant with larger flowers. The leaves are not spoon shaped.

### Life Cycle

Flowers bloom between June and August. Seeds are viable in the soil for over 30 years.

### Management

**Biological:** No biocontrol agents available. Grazing is not a viable option as it is unpalatable.

**Mechanical:** Mowing before flower will prevent seed production but needs to be combined with another control measure to meet eradication. Pulling or digging is effective on small populations, and needs to be repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Milestone applied before or at early flowering is effective.

**The best management practice is to apply Milestone in the summer when in flower.**



# Perennial Pepperweed

(*Lepidium latifolium*) Mustard Family

**LIST B** Noxious Weed in Colorado

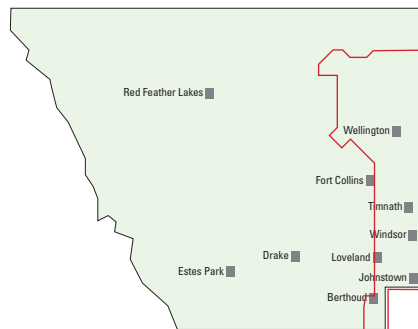


Photo © Jim Sebastian



Photo © Jim Sebastian

## Larimer County Distribution Map



## Perennial Pepperweed

Perennial pepperweed is a perennial with deep creeping roots. Reproduces both by seed and vegetatively by roots and shoots. Found in wetland areas like irrigated pastures, cropland, native meadows, marshy floodplains, valley bottoms, and seasonally wet areas.

### Identification

- Mature plants are 1-5 ft tall. Stems are covered with a waxy layer.
- Leaves are alternate, lance-shaped, entire to toothed, bright-green to gray-green, waxy, and don't have clasping bases. The basal leaves are larger than the upper leaves.
- White flowers are packed in dense clusters near the ends of branches.
- Fruits are nearly round, about 0.1 in wide and usually sparsely hairy and are viable for 10 years.
- Alters ecosystems by acting as a "salt pump" absorbing salts from deep in the soil and deposits it on the surface soil. Since most desirable plants do not tolerate high saline concentrated soils, they die off.

### Life Cycle

Flowering occurs May-Aug. Seed production is from June to August.

### Management

**Biological:** No biocontrol agents available. Grazing cows, sheep or goats in early spring can suppress growth but will regrow once the livestock is removed.

**Mechanical:** Mowing stimulates new growth but helps remove thatch and prevent shading of desirable species. Needs to be combined with another method as the plants will set seed at a reduced height. Pulling or digging established plants works the same as mowing. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Escort, Plateau, and Telar provide control in dry areas. For wetlands, Clearcast or Habitat can be applied. Habitat will kill everything. Applications should be made in the spring at the flowering stage.

**The best management practice is to apply Telar at flower stage.**



# Plumeless Thistle

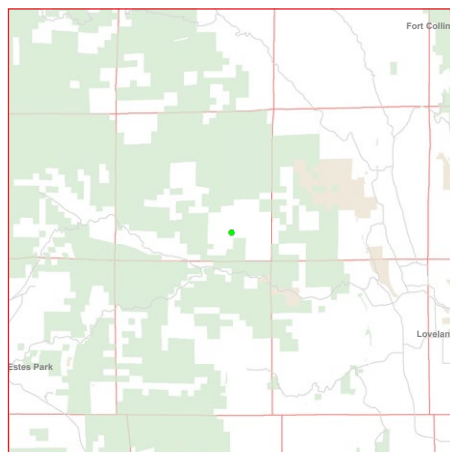
(*Carduus acanthoides*) Sunflower Family

**LIST B** Noxious Weed in Colorado

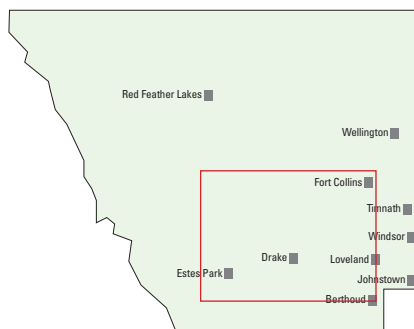
**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



● Plumeless thistle



# Plumeless Thistle

Plumeless thistle is a winter annual or biennial with a thick, fleshy taproot. It reproduces by seed only. It grows in disturbed sites, pastures, stream valleys, and along roadsides.

## Identification

- Mature plants are between 1-5 ft tall. Stems are freely branched above and covered with leaf-like spines that extend up to the flowering heads.
- Basal rosette leaves are usually 4-8 in long, wavy edges with yellow spines along the white-colored leaf margins.
- Leaves are alternate, stalk-less, have a white mid-rib, hairy underneath and blend into the stem.
- Flower bracts are narrowly lance-shaped and appear as sharp spines. Flowers are purplish-pink and clustered in heads of 2-5 that are 1-2 in wide.
- One-seeded fruit, capped by a ring of bristles. One plant can produce upwards of 9,000 seeds.
- Musk thistle looks a lot like Plumeless thistle and may hybridize with it.

## Life Cycle

Seedlings emerge from late summer to late fall. Over winters as a rosette and then bolts in early May. Flowering begins in early July and continues through October. Seeds may remain viable for up to 10 years in the soil.

## Management

**Biological:** No biocontrol agents available. Grazing is not a viable option as it is unpalatable to livestock.

**Mechanical:** Mowing is not a viable option for this species because it must be eradicated. Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Rangestar, Milestone, Transline, Garlon, Telar, Escort can provide control.

**The best management practice is to apply Milestone in the summer when in flower.**





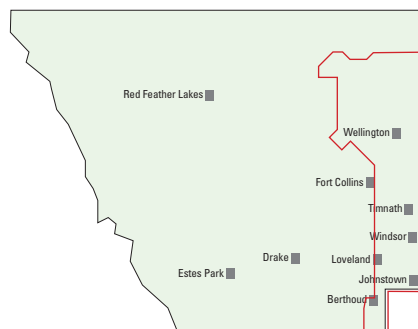
# Russian Knapweed

(*Acrofiton repens*) Sunflower Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Russian Knapweed

Russian knapweed is a deep-rooted perennial that spreads by aggressive, creeping, horizontal roots and seeds. Found in disturbed areas along roadsides, riverbanks, irrigation ditches, pastures, waste places, clearcuts, orchards and croplands.

### Identification

- Mature plants are between 18-36 in tall. The stems are erect, thin, stiff, branched, and when young are covered with soft, short, gray hair.
- Leaves are grayish-green, not hairy. Lower stem leaves are narrowly oblong to lance-shaped, and deeply lobed. The upper leaves are alternate, oblong, entire, toothed, and become progressively smaller.
- The flowers are urn-shaped, pink to purple in color, composed of disk flowers only, with papery bracts beneath and are solitary at the tips of the upper branches.
- Seeds are grayish or ivory, oval and compressed. A single plant may produce 1,200 seeds per year.
- Roots are brown to black with a scaly appearance.
- Russian knapweed contains an allelopathic compound, which inhibits the growth of competing plants.

### Life Cycle

Shoots emerge early in spring shortly after soil thaws. Bolts in late May to mid-June. Flowers from June to August and sets seed in late summer to early fall. Seeds are viable in the soil for two to three years.

### Management

**Biological:** No biocontrol agents available. Grazing animals generally avoid this plant because of its bitter taste. It can cause "Chewing Disease" in horses.

**Mechanical:** Pulling and mowing before the flower stage can reduce seed production and stress the plant, but they are not effective long-term management tools. Additionally, root fragments can develop into new plants.

**Chemical:** Milestone, or Transline provide control when applied in the fall.

**The best management practice is an application of Milestone after the plant dies and turns black.**



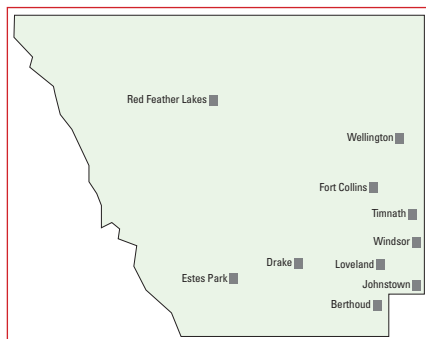
# Russian Olive

(*Elaeagnus angustifolia*) Oleaster Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Russian Olive

Russian olive is a deciduous tree that was initially introduced for erosion control, windbreaks and as an ornamental. It reproduces by seed or root suckers. Invades both upland and riparian communities, in stream corridors and around lakes and ponds.

### Identification

- Mature trees can grow up to 30 ft tall with branches that are flexible, reddish, and have 1 to 2-inch thorns.
- Leaves are light green above and silvery beneath, 2 to 3 inches long, alternate, narrow, and have simple blades with smooth edges.
- Flowers are 4 small petals, light yellow clusters and fragrant.
- Olive-shaped fruits are silver when first formed, becoming yellow-red when mature. Seeds are readily spread by birds.

### Life Cycle

Flowers appear May through June. Fruits mature from September to November. Seeds remain viable in the soil for up to 3 years.

### Management

**Biological:** No biocontrol agents available. Grazing is not an option for trees.

**Mechanical:** Cutting, bulldozing and fire are temporarily effective, though an herbicide application is necessary to prevent re-sprouting. Smaller trees can be pulled out of the ground with a weed wrench or tractor and chain. Girdling is not effective as the roots and crown will resprout below the cut area.

**Chemical:** Garlon, Roundup, and Arsenal will control this tree. If in an aquatic area all of these have versions that can be used there.

**The best management practice is in the fall when the leaves are falling off, cut the tree down as low to the ground as possible then apply Roundup to the stump to prevent re-growth. If trees are short and they can be left standing, apply Garlon to the leaves any time during the summer.**



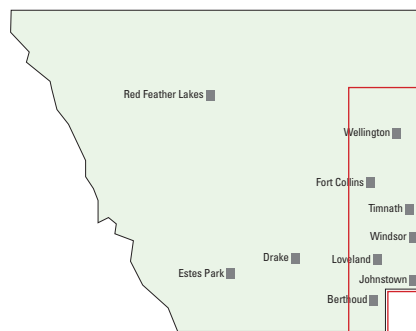
# Saltcedar

(*Tamarix ramosissima* and *T. chinensis*) Tamarisk Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



# Saltcedar

Saltcedar, or Tamarisk, is an introduced ornamental deciduous evergreen shrub or small tree used initially for windbreak, and erosion control. It reproduces by seeds as well as vegetatively including broken buried stems. Found in floodplains, along riverbanks, stream courses, salt flats, marshes, around lakes and ponds and irrigation ditches.

## Identification

- Mature plants grow up to 20 feet tall. The stems are reddish-brown, loosely branched, and slender.
- The leaves are alternate, small, cedar-like, and bluish-green in color.
- Tiny pink to white flowers have five petals and grow on slender spikes that are up to 2 1/2 in long.
- The seeds are borne in a lance-ovoid capsule. A mature plant can produce up to 600,000 seeds per year.
- As leaves fall and accumulate under saltcedar plants, the surface soil can become highly saline, thus impeding future colonization by many native plant species.

## Life Cycle

Buds break dormancy in February or March. Flowering occurs anytime between April and August. Seeds can germinate within 24 hours following contact with water. Ideal conditions for Salt cedar seedling survival are saturated soil during the first few weeks of life, a high water table, and open sunny ground with little competition from other plants. A new seedling can grow as much as 6 feet within a season, and are capable of flowering within a year of germination. Seeds are viable in the soil for up to 45 days under ideal conditions.

## Management

**Biological:** In Larimer County, sparse stands of tamarisk are not extensive enough to justify a release of a biocontrol defoliating insect that feeds on tamarisk, *Diorhabda elongate*. Grazing can suppress the plant if there is no other vegetation source available.

**Cultural:** Flooding areas of new seedlings for a month will kill them.

**Mechanical:** Cutting, bulldozing and fire are temporarily effective, though an herbicide application is necessary to prevent re-sprouting. Smaller trees can be pulled out of the ground with a weed wrench or tractor and chain. All fragments need to be removed from the area otherwise they can sprout.

**Chemical:** Garlon, Roundup, and Arsenal will control this tree. If in an aquatic area all of these have versions that can be used there.

**The best management practice is in the fall when the leaves are falling off, cut the tree down as low to the ground as possible then apply Roundup to the stumps to prevent re-growth.**

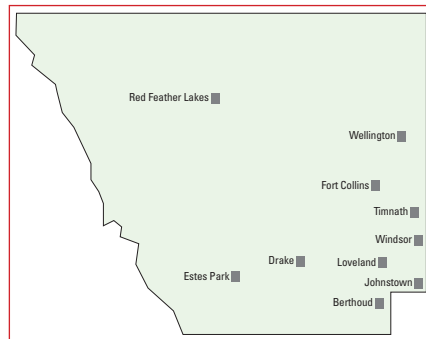
# Scotch Thistle

(*Onopordum acanthium*) Sunflower Family

**LIST B** Noxious Weed in Colorado



## Larimer County Distribution Map



## Scotch Thistle

Scotch thistle is a non-native biennial with a fleshy taproot. It reproduces solely by seed. It grows in disturbed sites, roadsides, railroads, irrigation ditches, waste areas, rangeland and pastures that are near riparian or sub-irrigated deeper soils.

### Identification

- Mature plants can grow up to 12 ft tall. Stems are numerous, branched, and have broad spiny wings.
- Rosettes can be 1 to 2 feet in diameter. Upper leaves are alternate, large, irregularly lobed, extend down onto the stem and have sharp yellow spikes. Leaf surfaces are covered with a thick mat of cotton-like or wooly hairs, giving the foliage a gray-green color.
- Flowers are numerous, 1-2 inches wide, reddish-purple to violet, with spine-tipped bracts.
- One-seeded fruit is wrinkled, brown to grayish-black, tipped with slender bristles. Can produce up to 14,000 seeds per plant.

### Life Cycle

Germination occurs in late summer or early fall. Newly emerged plants over-winter in a rosette stage, bolt, then flower in the spring or early summer of the following season. From mid-summer into fall, these thistles begin producing seed. Seeds remain viable in the soil for over 30 years.

### Management

**Biological:** No biocontrol agents available. Grazing with sheep or horses of the rosette will delay flowering. Goats will eat the flowers and prevent seed production. Cows will not eat it.

**Mechanical:** Mowing can provide suppression but needs to be done often throughout the season or combined with herbicides. Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Milestone, Transline, or Telar provide control at the rosette to early bolt stage. Milestone will provide some pre-emergent control and Telar can be used later to stop seed production.

**The best management practice is an application of Milestone in the spring before the plant starts to bolt.**

# Spotted Knapweed

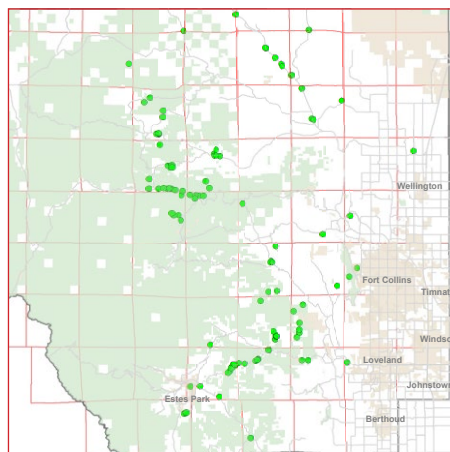
(*Centaurea Stoebe*) Sunflower Family

**LIST B** Noxious Weed in Colorado

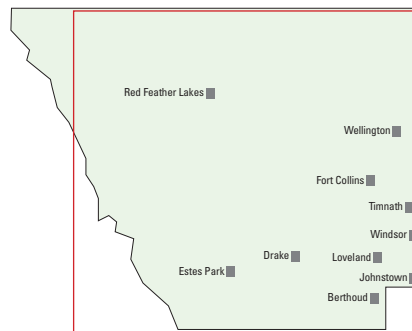
**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



● Spotted knapweed



## Spotted Knapweed

Spotted knapweed is a short-lived perennial with a stout taproot. Reproduces mainly by seed but can also reproduce vegetatively from lateral roots. It thrives in disturbed and overgrazed sites with dry-to-moist soils.

### Identification

- Mature plants can grow up to 3 feet tall on rigid stems that are openly branched on the upper half of the plant.
- Rosette leaves are low lying, 6 in long, and deeply lobed. Upper leaves are alternate, narrow, pinnately divided, have smooth margins, and become smaller toward the top of the shoot. All are coarse like sandpaper.
- Buds are urn-shaped solitary at the ends of branches with black spots on the bracts. Flowers are pink-to-purple and rarely white.
- Seeds have a tuft of persistent bristles. Can produce up to 900 seeds per plant.
- Closely related to diffuse knapweed (*Centaurea diffusa*) and can hybridize with it.

### Life Cycle

Rosette leaves appear at the base of the previous year's growth in fall or spring or germinate from seed. Remains in the rosette stage over winter. It usually bolts in May of its second growing season and flowers June through October and seed-set usually occurs by mid-August. Seeds are viable in the soil for up to 8 years.

### Management

**Biological:** The insect biocontrol root weevil, *Cyphocleonus achates*, reduces the vigor of the plant. Grazing in early spring will suppress seed production but needs to be followed up with another method to eradicate.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Wear protective gloves and long sleeves as the sap can cause skin irritation. Mowing at bud stage, multiple times a year, can reduce seed production and prevent plants from blowing and dispersing seed, but serves only to suppress infestations and needs to be followed up with another method to eradicate.

**Chemical:** Milestone or Transline are effective when applied at the rosette to bud stage. Both provide pre-emergent control also.

**The best management practice is to apply Milestone to rosettes in the spring.**

# Yellow Toadflax

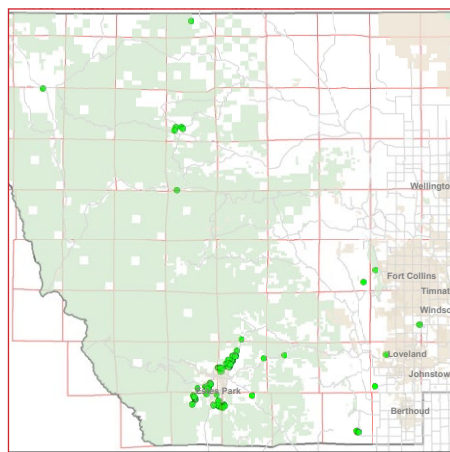
(*Linaria vulgaris*) Figwort Family

**LIST B** Noxious Weed in Colorado

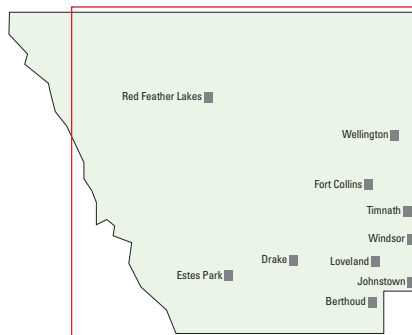
**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map



● Yellow toadflax



# Yellow Toadflax

Yellow toadflax, commonly referred to as butter-n-eggs, is an escaped ornamental perennial with an extensive root system. Reproduces both by seeds and vegetatively. Found along roadsides, fences, rangelands, croplands, clear cuts, pastures, disturbed or cultivated ground, shrublands and forests in cooler, wetter sites along streams or in mountain meadows.

## Identification

- Mature plants are 1-3 ft tall with 1-25 smooth erect floral stems. The stems are woody at the base and smooth toward the top.
- The leaves are alternate, green, narrow, linear, and 1 to 2 inches long. Similar in appearance to leafy spurge, but lacks the milky latex.
- The flowers are snapdragon-like yellow with orange throats and a long spur on the upper ends of the stems. They are arranged in a raceme clustered toward the top of the plant.
- Seed capsules are round-ovate, 0.3-0.5 in long, and two-celled. Seeds are brown or black, circular, and surrounded by a notched wing. One plant can produce up to 30,000 seeds annually.
- Closely related to Dalmatian toadflax (*Linaria dalmatica*) and hybridizes with it.

## Life Cycle

Spring emergence occurs around May, depending upon temperature. Flowering occurs from July through September and seeds mature from August through October. Seeds remain viable in the soil for ten years.

## Management

**Biological:** No biocontrol agents available. Grazing is not an option, the plant is known to be mildly poisonous and unpalatable.

**Mechanical:** Mowing before flower will prevent seed production but needs to be combined with another control measure to meet eradication. Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year for several seasons. If flowers/seeds are present they need to be bagged and disposed of.

**Chemical:** Telar is effective at the flowering stage in mid summer.

**The best management practice is to apply Telar when the plant is flowering in mid summer.**



PLANT IDENTIFICATION  
**LIST C**



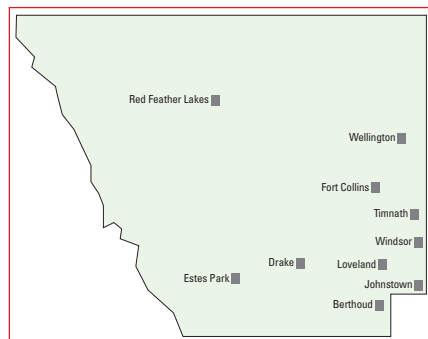
# Cheatgrass (Downy Brome)

(*Bromus tectorum*) Grass Family

**LIST C** Noxious Weed in Colorado



## Larimer County Distribution Map



# Cheatgrass (Downy Brome)

Downy brome or Cheatgrass is a winter annual with a shallow fibrous root system. It reproduces solely by seed. Invades agricultural fields and range land.

## Identification

- Cheatgrass ranges in height from 2 to 36 inches. Each plant contains multiple stems that are erect in nature.
- Leaves are slender green flat blades and densely covered with soft hairs.
- Flowerheads are slender, 3/8 to 3/4 of an inch long and are nodding born at the end of the stems, and are multi-branched. The awns on the end are usually 3/8 to 5/8 of an inch long. When mature they are reddish or purple.
- Barbs allow seeds to attach to fur, clothing and gear. An infestation can produce up to 80,000,000 seeds per acre.
- At maturity, the abundant and very prickly seed heads become a nuisance to livestock, pets and hikers.

## Life Cycle

Germinates in late summer or early fall. It is one of the last plants to go dormant during the winter and one of the first plants to green-up in early spring. It matures and produces seed by June. Seeds may be viable in the soil for 5 years.

## Management

**Biological:** No biocontrol agents available. Grazing in the spring, prior to seed set, can provide suppression, but this grass will readily re-grow and set seed from a reduced height.

**Mechanical:** Pulling or digging is effective on small populations, and needs to be repeated multiple times a year. Mowing can reduce seed production if done at an early flowering stage and repeated. If flowers/seeds are present, for both pulling and mowing, they need to be bagged and disposed of.

**Chemical:** Rejuvra applied before seeds start to root in June/July. Plateau applied prior to emergence, or at an early post-emergent stage (prior to development of second leaves) in August-October during monsoon rains. Roundup applied in winter or early spring when perennial grasses are dormant.

**The best management practice is Rejuvra applied in June.**



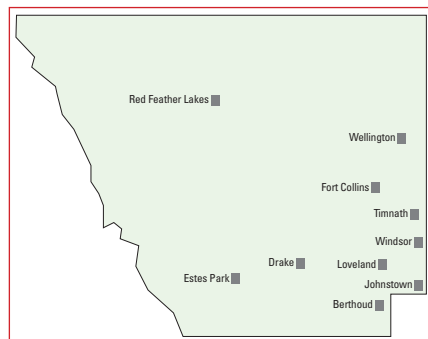
# Common Mullein

(*Verbascum thapsus*) Figwort Family

**LIST C** Noxious Weed in Colorado



## Larimer County Distribution Map



## Common Mullein

Common mullein is a biennial with thick taproot. It reproduces by seed only. Found in neglected meadows, forest openings, pastures, fence rows, roadsides, and industrial areas.

### Identification

- Mature plants grow 2 to 6 feet tall. Stems are erect, rigid, covered with wooly hairs, thick, nearly leafless.
- Basal rosette of hairy, broad, oblong leaves can grow to 30 inches, has entire margins, wooly and light-green. Stem leaves alternate, somewhat clasping, and decrease in size towards the end of the stem.
- Flowers are five-petaled and sulfur- yellow 3/4 to 1 1/2 inches in diameter. Grow in terminal spikes that can be 20+ inches long.
- The fruit is an ovoid capsule that splits with numerous two chambered fruits produce 100,000 to 250,000 seeds per plant.
- The rosettes can be confused with Lamb's ears (*Stachys byzantina*) and Mediterranean sage (*Salvia aethiopsis*).

### Life Cycle

The first year of the plant it produces a basal rosette. In the spring of the second year, the plant bolts, flowers in June through August, spikes turn brown as seeds mature, then the plant dies. Seeds may last 100+ years in the soil.

### Management

**Biological:** No biocontrol agents available. Grazing is not an option, the plant is unpalatable.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Mowing plants at the bolt to early flower stage can reduce seed production. Does not survive tilling, but the disturbance can stimulate seeds to germinate.

**Chemical:** Escort, Telar and Milestone all provide control. Methylated seed oil needs to be added to penetrate the hairy leaf surface.

**The best management practice is an application of Milestone and Telar on the rosettes in either fall or spring.**



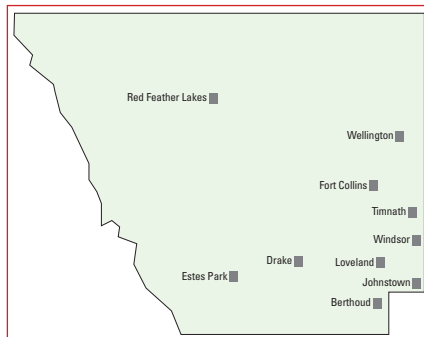
# Field Bindweed

(*Convolvulus arvensis*) Morning Glory Family

**LIST C** Noxious Weed in Colorado



## Larimer County Distribution Map



## Field Bindweed

Field bindweed is a deep-rooted escaped ornamental perennial that reproduces from seed and creeping, horizontal roots. Found in disturbed sites, pastures, rights-of-way, agricultural lands, orchards, vineyards, lawns and gardens.

### Identification

- Field bindweed stems grow low to the ground, twining, and grows up to 6 feet long.
- Leaves are arrowhead shaped, 1/2 to 2 inches long and decrease in size towards the end of the stem.
- Flowers are bell or trumpet shaped, with 5 fused petals, white to pink, about 1 inch long.
- Round, smooth, ¼ inch cone-shaped capsule with 1-4 seeds in each. About 550 seeds per plant.
- Looks like Morning glory.

### Life Cycle

Plants emerge in late spring, flowers appear by mid-summer, soon seed capsules develop. Seeds are viable in the soil for 20-50 years.

### Management

**Biological:** Grazing is not an option, as the plant accumulates toxic levels of nitrates and contains tropane alkaloids. Insect biocontrol gall mite, *Aceria malherbae*, and to a lesser extent a defoliating moth, *Tyta luctuosa*, decrease the vigor of the plant.

**Mechanical:** Due to its low growth pattern, mowing is not effective. With its extensive root system pulling or digging is not effective. Tillage is not an effective control method, as it can spread by root fragments.

**Chemical:** Plateau, Quinstar and Garlon applied in the spring can manage this plant.

**The best management practice is to apply Quinstar in the spring and to ensure there's there is competition from other plants on site of desired species.**



# Poison Hemlock

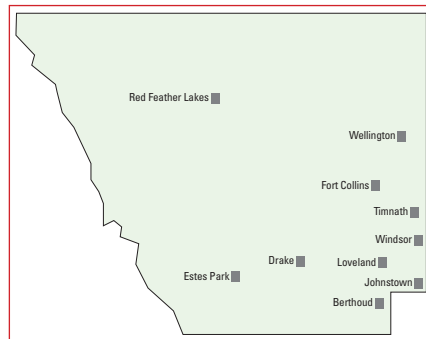
(*Conium maculatum*) Parsley Family

**LIST C** Noxious Weed in Colorado



Photo © Ohio State University

## Larimer County Distribution Map



# Poison Spotted Hemlock

Poison hemlock is a biennial with a fleshy taproot. It reproduces by seed only. Found in moist areas.

## Identification

- Mature plants grow 4 to 8 feet tall, have smooth, hollow stems that are rigid, branched, ribbed, waxy, and have distinct purple spots.
- Leaves are shiny green, pinnately compound, multi-stemmed and have a fern-like appearance with a musty odor.
- Flowers have 5 petals, clawed, notched, 1 to 1.5 mm long, and are white, umbrella-like clusters at the end of the branch.
- Seeds are flat, small and grayish-green in color.
- Poison hemlock is commonly mistaken for wild carrot or parsley.

## Life Cycle

The first year the plant usually forms a large rosette. The second year the plant bolts a large stem, flowers from June to July, seeds in August-September and then dies.

## Management

**Biological:** No biocontrol agents available. Grazing is not an option, as the plant is poisonous.

**Mechanical:** Mowing hemlock plants to keep them short will decrease the chance of poisoning but needs to be repeated. Do not hay areas with standing plants as they are still toxic when dried. Pulling or digging is recommended for small populations, the whole taproot needs to be removed. If flowers/seeds are present they need to be bagged and disposed of. Wear gloves and wash up afterwards.

**Chemical:** 2,4-D, Escort, Telar, Garlon, or Rodeo control early growth. 2,4-D, Garlon and Rodeo can be used in wet areas.

**The best management practice is Telar or Garlon 3A (aquatic) in spring.**



Photo © Jeff Stachler



Photo © Jeff Stachler

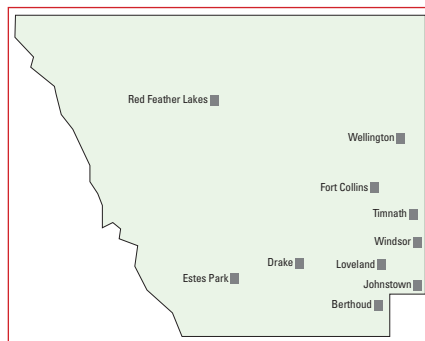
# Puncturevine

(*Tribulus terrestris*) Caltrop Family

**LIST C** Noxious Weed in Colorado



## Larimer County Distribution Map



# Puncturevine

Puncturevine is a summer annual with a taproot. It reproduces by seeds only. Found in pastures, orchards, vineyards, rights-of-way, trailheads, and vacant lands.

## Identification

- Mature plants form mats with trailing stems, 1-5 feet long. Grows radially from a central crown.
- Leaves are formed into leaflets, with each leaflet containing 5 to 8 oval leaves which are slender, slightly hairy, opposite, dark green, pinnately compound.
- Flowers are small, yellow, 5-petaled.
- The seed capsules are referred to as a "goathead." It is hard, woody, spiny, almost tack like. Each capsule produces 2-4 seeds. Seedheads may attach to gear, pets, shoes and puncture bike tires.
- Look alike plants are prostrate spurge and prostrate knotweed.

## Life Cycle

Germinates throughout the season starting in May with multiple flushes following rainfall throughout the summer. The flowers appear in July through October. Seeds can stay viable in the soil for 4 to 5 years.

## Management

**Biological:** Insect biocontrol agents are available that feed on the seeds (*Microlarinus lareynii*) and stems (*Microlarinus lypriformis*) and provide effective management in some areas. Grazing is not an option, as the plant is poisonous.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. A handy trick to pick up multiple seeds safely is to press a slab of Styrofoam on the ground of the infested area. Mowing is not recommended because of its low growth pattern. Shallow tillage can kill existing plants but needs to be repeated.

**Chemical:** Dicamba, 2,4-D, and Vista XRT effectively control emerging puncturevine, needs to be repeated every 3 weeks. Telar has residual activity and will prevent plants from coming up all season.

**The best management practice is an application of Telar in May before the plants come up. Also reduce seed pressure by using styrofoam to pick up seeds out of heavily infested areas.**

A scenic view of a pond surrounded by dense evergreen trees and yellow iris flowers in the foreground. The water is calm, reflecting the surrounding greenery. In the background, a house is partially visible through the trees. The foreground is dominated by tall green iris leaves and bright yellow iris flowers. A semi-transparent white box is overlaid on the right side of the image, containing the text "PLANT IDENTIFICATION WATCH LIST".

PLANT IDENTIFICATION  
**WATCH LIST**

# Baby's Breath

(*Gypsophila paniculate*) Pink Family

**WATCH LIST** Weed in Colorado

This is a **high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Baby's Breath

Baby's breath is an escaped perennial ornamental with a tap root. It is commonly found in pasture, roadsides, ditches and fences near homesteads, cemeteries, and residential areas. It reproduces by seed.

### Identification

- Plants are 12 - 18 inches tall and up to 16 inches wide with slender stems that are swollen at the nodes.
- Numerous small white or pink flowers with five petals are clustered and delicate.
- Leaves are opposite, lance-shaped, hairy, 3/4 - 4 inches long.
- Roots can be up to 12 feet deep.

### Life Cycle

In the spring new shoots come up from the crown of the plant or seedlings. Blooms June to October. Each plant can produce up to 14,000 seeds that are dispersed in a tumbleweed. Seeds may be viable in the soil for 2 years.

### Management

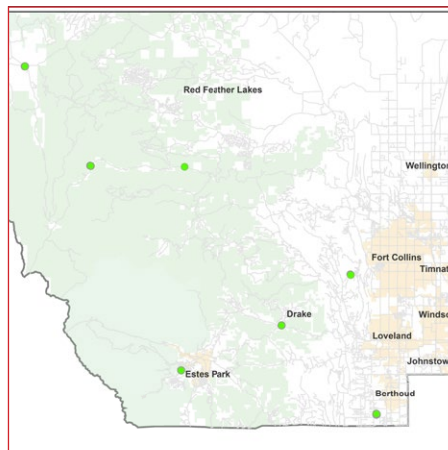
**Biological:** No insect biocontrol agents are available. Grazing is not an option as it is not very palatable.

**Mechanical:** Hand pulling or digging is only effective if about a foot of the root is removed so that the crown is severed off. Touching can cause allergic reactions including dermatitis, difficulty breathing, and sinus irritation. Mowing is not advised as it will regrow readily.

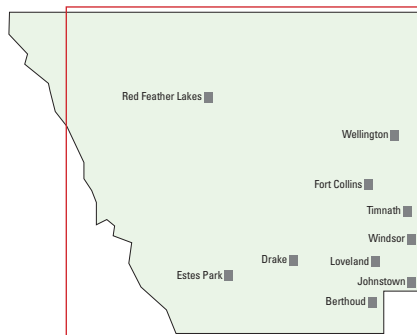
**Chemical:** Telar or Escort sprayed in the spring when the plants are starting to bolt will control the baby's breath.

**The best management practice is to spray Telar in the spring. If flowers/seeds are present they need to be bagged and disposed of.**

### Larimer County Distribution Map



● Baby's breath



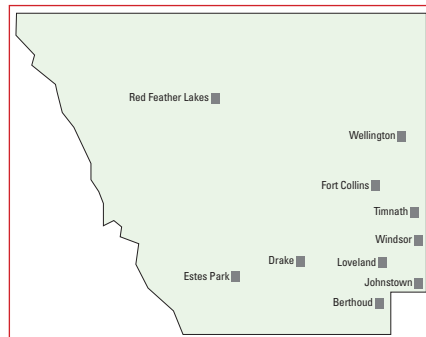
# Hoary Alyssum

(*Tribulus terrestris*) Caltrop Family

**WATCH LIST** Weed in Colorado



## Larimer County Distribution Map



## Hoary Alyssum

Hoary alyssum is an annual, biennial or short-lived perennial plant that reproduces by seed only. It is found along roadsides and disturbed areas of range and pasture.

### Identification

- Plants grow 1-3 feet tall, tiny star-shaped hairs all over the plant.
- Flowers are white with four notched petals and clustered at stem tips.
- Leaves oval to lance-shaped, alternate; stem leaves attached and point upward 2-3 inches long.

### Life Cycle

Plants emerge from winter dormancy or new seedlings start to grow in April. Flowers appear June through October. Seeds can remain dormant and viable in the soil for several years.

### Management

**Biological:** Grazing is not an option as it is poisonous. No insect biocontrol agents are available.

**Mechanical:** Hand pulling or digging is effective, but persistence is necessary. Mowing can provide suppression, but plants often re-grow and set seed from a reduced height. Needs repeated mowings.

**Chemical:** Escort, Plateau and Telar provide control when sprayed in the spring before or at flower.

**The best management practice is an application of Telar at the flowering stage.**



# Swainsonpea

(*Sphaerophysa salsula*) Pea Family

**WATCH LIST** Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Larimer County Distribution Map

Known populations in Larimer County are currently considered eradicated. However, new infestations can occur.



## Swainsonpea

Swainsonpea is a perennial plant with a woody, creeping horizontal root system. It is found in moist disturbed sites, roadsides, irrigation ditches, and cultivated crops and reproduces by seed and creeping roots.

### Identification

- Stems are erect, 2 - 5 feet tall, and covered in short white hairs.
- Flowers are brick red or orange-red, 1/4 - 1 inches long, and pea-shaped. They form groups of 6 to 16 at the end of axillary stems.
- Leaves are made up of 9 - 25 oval leaflets, are alternate, 1/2 - 1 inch long, compound pinnate, with silvery hairs on underside.
- Seeds form in inflated bladder-like pods, 3/4 - 1 1/2 inches long.

### Life Cycle

Blooms May to August.

### Management

**Biological:** Grazing is not advised as it is unpalatable to livestock. There are no insect biological agents available.

**Mechanical:** Pulling or digging of this plant can be effective if as much of the root as possible can be removed also. Needs to be followed up frequently on any regrowth. Mowing before flower will prevent seed production but needs to be combined with another control measure to be eradicated.

**Chemical:** Milestone, Transline, Garlon 3A will control Swainsonpea at early bloom or in the fall. An aquatic labeled herbicide like Garlon 3A needs to be applied where water is standing.

**The best management practice is to spray Milestone when the plant is flowering. If flowers/seeds are present they need to be bagged and disposed of.**



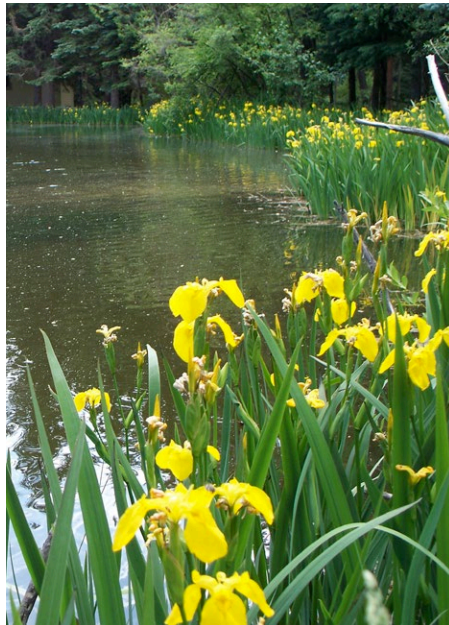


# Yellow Flag Iris

(*Iris pseudacorus*) Iris Family

**WATCH LIST** Weed in Colorado

**This is a high priority weed** in Larimer County with a management goal of eradication. Report any suspected sightings in Larimer County immediately to the Land Stewardship office!



## Yellow Flag Iris

Yellow flag iris is a perennial escaped ornamental that has thick creeping roots and reproduces by seed and roots. It grows in moist soils near pond margins, irrigation ditches, and wetland sites.

### Identification

- Plants are 3 - 6 feet tall.
- Flowers are yellow, 2 - 4 inches wide with 3 upward curved petals and 3 downward curved sepals with brown to purple streaks. There are multiple flowers along the stems.
- Leaves are dark green, sword-shaped, 1 ¼ inches wide with a thickened middle. They arise from the base up to 35 inches long and overlap each other.
- Large seed capsules are 3 inches long and brown.
- There are many native and ornamental irises. None are aquatic.

### Life Cycle

Leaves emerge from dormancy in early spring. Flowering occurs May through July.

### Management

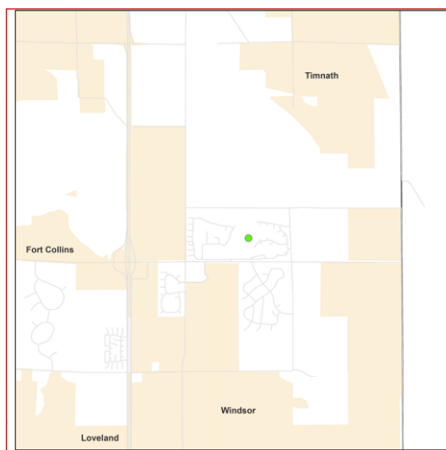
**Biological:** Grazing is not advised as it is poisonous to livestock. There are no insect biocontrols available.

**Mechanical:** Hand pulling or digging can be effective if all the roots are removed. Mowing is not advisable in a wetland environment.

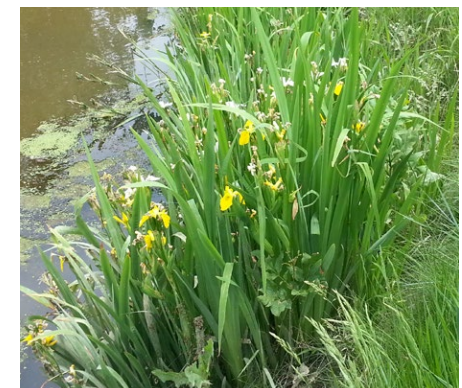
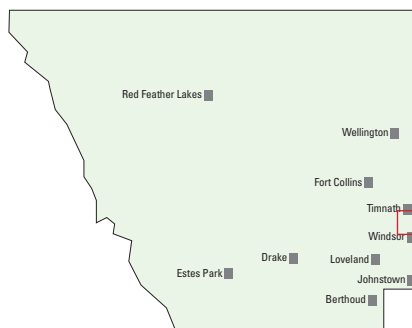
**Chemical:** An aquatic labeled herbicide like Rodeo or Arsenal needs to be applied where water is standing. All need to be applied before flowering or in the fall.

**A best management practice is to spot-spray plants with Rodeo before flower. If flowers or seed heads are present they need to be bagged and disposed of.**

### Larimer County Distribution Map



● Yellow flag iris





**PLANT IDENTIFICATION  
TROUBLESOME PLANTS**

# Feral Rye

(*Secale cereale*) Grass Family

## TRoublesome Weed in Colorado

Feral rye, once referred to as volunteer rye, is an extremely competitive winter annual grass species planted as livestock forage, a cover crop and as a reclamation species. It has become an invasive problem in winter wheat fields, roadside rights-of-ways, rangelands and pasture.



## Identification

- These robust grass growing 2-5 feet tall.

## Life Cycle

Germinates primarily in the late summer or early fall (some spring germination as well), overwinters in a dormant stage, resumes growth early in the spring and reaches maturity by mid-July. Seed viability in the soil is about 3 years.

## Management

**Biological:** No biocontrol agents are available. Intensive grazing, when plants are small, can reduce populations. The regrowth needs to be grazed again or managed with another method.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. A handy trick to pick up multiple seeds safely is to press a slab of Styrofoam on the ground of the infested area. Mowing is not recommended because of its low growth pattern. Shallow tillage can kill existing plants but needs to be repeated.

**Chemical:** Rejuvra applied in June thru early July, before it sprouts, can control rye for several seasons. In winter or early spring when perennial grasses are dormant, low rates of glyphosate must be added to the Rejuvra to control rye with little or no injury to desirable grasses.

**The best management practice is to apply Rejuvra in June.**

# Kochia

(*Kochia scoparia*) Goosefoot Family

## TRoublesome Weed in Colorado

Kochia is an annual plant with a taproot. It reproduces by seed only. It is found in disturbed sites and areas of high soil nitrates such as abandoned corrals and barnyard areas, dryland and irrigated agriculture, rangeland and roadsides.



## Identification

- Mature plants grow 1 – 6 feet tall, are highly branched with a rounded, bushy look.
- Leaves are blue-green, covered with hairs.

## Life Cycle

In March mats of tiny Kochia plants germinate, flowers in July to October. In fall/winter plants break loose and become tumbleweeds dispersing seed. Seed remains viable in the soil for 2 -3 years.

## Management

**Biological:** No biocontrol agents are available. Intensive grazing, when plants are small, can reduce populations. The regrowth needs to be grazed again or managed with another method.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. Mowing before flowering can reduce seed production but needs to be done multiple times a year. These plants do not survive tilling, but the disturbance can stimulate more seeds to germinate.

**Chemical:** E-2, Rangestar, or Vista will provide control when applied the plant is between 4 inches to 6 inches tall. Vista can be used on newly seeded areas.

**For areas that are being reclaimed, seed in the winter, apply Vista after most seed has germinated and plants are 4 inches tall. In areas that have desirable species already, apply E-2 when plants are 4 inches tall. For areas that are not ready to be reclaimed that year, mow down often to reduce seed production, the mat of kochia will prevent muddy situations and loss of soil.**

# Annual Mustards Mustard Family

Blue Mustard, Flixweed, Tumble Mustard and Yellow Alyssum

## TROUBLESOME Weed in Colorado

These mustards are annual plants with a taproot and reproduce by seed. They are problematic in winter wheat fields, pastures and through the first cutting of alfalfa, though inconspicuous by mid-summer after completing the life cycle.

## Identification

- Flowers are cross shaped, 4 petals, which is a distinctive characteristic of the mustard family.
- Flowering mustards are often quite pungent, the odor is irritating to people with allergies.

## Life Cycle

The species listed above follow a winter annual life cycle – germination in the fall or early spring and flowering and seed set in April and May.

## Management

**Biological:** No biocontrol agents are available. Intensive grazing, when plants are small, can reduce populations. The regrowth needs to be grazed again or managed with another method.

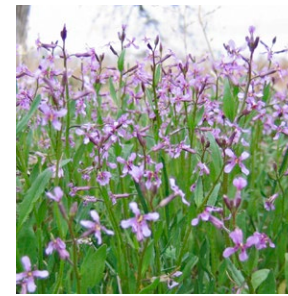
**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. A handy trick to pick up multiple seeds safely is to press a slab of Styrofoam on the ground of the infested area. Mowing is not recommended because of its low growth pattern. Shallow tillage can kill existing plants but needs to be repeated.

**Chemical:** Escort or Telar herbicide can provide control when applied before flowering.

**The best management practice is to apply Escort or Telar in early spring.**



Blue mustard



Flixweed



Tumble mustard



Yellow alyssum



# Russian Thistle

(*Salsola iberica*) Goosefoot Family

## TROUBLESOME Weed in Colorado

Russian thistle is an annual plant with a taproot. It reproduces by seed only. It readily invades disturbed sites and areas of high soil nitrates such as abandoned corrals and barnyard areas, irrigated agriculture, rangeland and roadsides.



## Identification

- Mature plant grows 0.5 – 3 feet tall.
- Flowers are located at the base of the long, pointed leaves.
- Considered the classic tumbleweed plant, the mature plants break loose and tumbles with the wind in the winter.

## Life Cycle

Russian thistle germinates in April or May and produces flowers mid to late summer. Seed remains viable in the soil for 2-3 years.

## Management

**Biological:** No biocontrol agents are available. Intensive grazing, when plants are small, can reduce populations. The regrowth needs to be grazed again or managed with another method.

**Mechanical:** Pulling or digging is effective on small populations if more than 2 inches of the root is removed and repeated multiple times a year. If flowers/seeds are present they need to be bagged and disposed of. A handy trick to pick up multiple seeds safely is to press a slab of Styrofoam on the ground of the infested area. Mowing is not recommended because of its low growth pattern. Shallow tillage can kill existing plants but needs to be repeated.

**Chemical:** 2,4-D and dicamba treated when the plants are young can provide control.

**During reclamation apply a low dose of 2,4-D, or pull the plants in the spring. After establishment, apply a regular dose of 2,4-D in spring.**





# Poisonous Plants

It is critically important for landowners to recognize dangerous plants in and around their properties, which are poisonous to humans and animals. Plant poisoning severity of animals is dependent upon several factors: the quantity of plant consumed, relative toxicity of the plant, growing conditions, time of year; and animal species, age, health, stress level and size of the animal. Animals grazing well-managed pastures with abundant forage, or fed inspected hay will, for the most part, not find these poisonous plants palatable.

If poisonous plants are suspected as the cause of an animal's symptoms, a veterinarian should be consulted immediately.

# PLANT IDENTIFICATION POISONOUS PLANTS



Animals Affected by Poisonous Plant

	Alpaca	Bison	Cat	Cattle	Dog	Goat	Human	Horse	Llama	Poultry	Sheep	Swine
Alyssum								X				
Canada Thistle	X			X								
Cheatgrass	X	X		X	X	X		X	X		X	X
Death Camas	X	X	X	X	X	X	X	X	X	X	X	X
Field Bindweed	X			X				X	X			
Geyer Larkspur	X			X					X			
Houndstongue	X			X				X	X		X	
Kochia	X			X					X		X	
Leafy Spurge	X			X								
Low Larkspur	X			X					X	X		
Myrtle Spurge	X			X			X			X		
Poison Hemlock	X	X	X	X	X	X	X	X	X	X	X	X
Poison Ivy							X					
Ponderosa Pine		X		X								
Puncture Vine	X	X	X	X	X	X	X	X	X	X	X	X
Purple Locoweed	X			X		X		X	X		X	
Russian Knapweed								X				
Russian Thistle	X		X									
Water Hemlock	X	X	X	X	X	X	X	X	X	X	X	X
Western Chokecherry	X	X		X		X			X		X	
White Locoweed	X			X		X		X	X		X	
Yellow Starthistle								X				

Photo © Tony Knight

# Poisonous Plants

Plant names underlined are in the top three poisonous plants of Larimer County and are further discussed in the following pages. Names **bolded** are noxious weeds that have poisonous qualities and are covered elsewhere in this guide. Those **bolded** and *italicized* are troublesome weeds with poisonous properties and are covered elsewhere in this guide.

## Poisonous Plant Listed by Symptom

Plants causing sudden death:		
Death camas Dogbane Geyer larkspur	<u>Low larkspur</u> Milkweeds	<b>Poison hemlock</b> <u>Water hemlock</u>
Cyanide poisoning:		
Arrow grass Blue flax Elderberry	Mountain mahogany Poison suckleya	Western chokecherry Western serviceberry
Nitrate poisoning:		
Barnyardgrass <b>Canada thistle</b> Curly Dock <b>Field bindweed</b> Goldenrod <b>Kochia</b>	Lambsquarter Mallow Nightshades Pigweed Ragweed <b>Russian thistle</b>	Smartweed Sorghum Sunflower Sweetclover Wild oat grass
Plants causing kidney failure (Oxalates):		
Curly dock Greasewood <b>Kochia</b>	Lambsquarter Pigweed Purslane	<b>Russian thistle</b> Wood sorrel
Plants affecting the digestive system:		
Any plants with sharp awns, burs, thorns, or spines (eg: cocklebur, burdock, <b>cheatgrass</b> , foxtail)		
Baneberry Bitterweed Bouncingbet	Buttercup Corn cockle Colorado rubberweed	<b>Field bindweed</b> <b>Leafy spurge</b> Nightshades

## Poisonous Plant Listed by Symptom

Plants causing liver disease and photosensitization of the white skinned areas:		
Blue-green algae Buckwheat Common cocklebur <b>Flixweed</b>	Groundsel, Senecio <b>Houndstongue</b> Knotweed <b>Kochia</b>	<b>Puncturevine</b> St. Johnswort Tansy mustard Wild carrot
Plants affecting the nervous system:		
Crown vetch Fringed sage <u>Geyer larkspur</u> Horsetail Low larkspur	Peas (perennial species) <b>Poison hemlock</b> Purple locoweed <b>Russian knapweed</b>	Sand sage <u>Water hemlock</u> <u>White locoweed</u> <b>Yellow starthistle</b>
Plants associated with congenital defects and reproductive failure:		
Broom snakeweed Groundsel <u>Locoweeds</u> Lupine	Milk vetch Mountain thermopsis <b>Poison hemlock</b> Ponderosa pine	Western false hellebore Wild pea
Plants affecting the blood:		
Flatweed	Golden banner	<b>Alyssum</b>
Selenium poisoning:		
Beard tongue Goldenweed Gumweed	Indian paintbrush Milk vetch Prince's plume	Saltbush White fall aster
Plants affecting milk production:		
Plants affecting the skin:		
Poison ivy (not toxic to livestock)		

# Larkspur

**Geyer or foothills larkspur** (*Delphinium geyeri*) Buttercup Family  
**Low larkspur** (*Delphinium nuttallianum*) Buttercup Family

**POISONOUS** Native Plant in Colorado



Geyer larkspur



Low larkspur



Low larkspur

Both species are native perennials with roots that are tuberous and woody. These plants are found from moist mountain meadows and open forests to dry sandy sagebrush plains.

## Identification

- Mature plants grow to 2 to 3 feet tall with hollow stems.
- Leaves are lobed into 3-5 divisions, which are lobed again and are hairy.
- Flowers are purple in geyer larkspur, low larkspur may have white sepals with a distinct spur pointing backwards.

## Life Cycle

Flowering occurs during April through July.

## Management

**Biological:** Sheep and goats can be used as biological controls to graze larkspur prior to cattle entering a pasture.

**Chemical:** The most effective herbicides are Escort or Tordon mixed with a good surfactant. Apply when plants are approaching maximum vegetative growth, but before flowers open.

**The best management practice is to keep livestock out of the pasture when larkspur is flowering and until seeding has occurred.**

# Locoweed

**White locoweed** (*Oxytropis sericea*) Legume Family  
**Purple locoweed** (*Oxytropis lambertii*) Legume Family

**POISONOUS** Native Plant in Colorado



Otherwise known as “crazy weed,” locoweeds are native perennials. They are found on rocky prairies, plains, hillsides, gravelly banks, and open wooded hillsides.

## Identification

- Mature plants are 2 to 12 inches tall.
- Leaves are basal, with leaflets on each side and one at the tip, all covered with silky hairs.
- White or purple pea-like flowers, depending on the species, in a raceme on a leafless stem.

## Life Cycle

Flowering occurs during April through August. Seeds stay viable for 50 years in the soil.

## Management

**Biological:** Try not to graze pastures with locoweed during the summer months when palatability is high.

**Chemical:** Milestone, Transline, Escort, or Garlon with MSO will control locoweeds but re-treatment will be necessary.

**The best management practice is to create “safe” pastures that have no locoweed to move the animals into when palatability is high or when they may have consumed some.**



# Water Hemlock

(*Cicuta maculata*) Parsley Family

**POISONOUS** Native Plant in Colorado



Water hemlock is a native perennial with multiple tuberous roots. It is commonly found in wet sites.

## Identification

- Mature plants grow 4 to 6 feet tall.
- Stems are erect, stout, branched at top, often waxy, with hollow stems; base of stem enlarged, chambered and has a yellow, pungent fluid.
- Plants produce tiny white flowers with 5 petals in an umbel at the ends of branches.
- Leaves are alternate, with 2 to 3 leaflets longer than wide. The leaves have toothed margins, uppermost leaves sometimes simple.

## Life Cycle

Flowering occurs during June through August.

## Management

**Biological:** Do not graze in the spring when the plant is most palatable.

**Mechanical:** Digging and disposing of large plants, including all roots, is the best way to prevent seed production and dispersal. Be cautious of the toxicity and wear appropriate clothing.

**Chemical:** Spot treating with herbicide treatments of 2,4-D, Escort, Telar, Garlon 3A, or Rodeo is effective for control of early growth. After spraying keep animals away from treated area because an increase in palatability can occur. Repeat herbicide application until seed bank is depleted.

**The best management practice is to eliminate water hemlock by spraying it with herbicide or disposing of the whole plant, especially the root.**



# HERBICIDE REFERENCE GUIDE



# Herbicide Reference Guide

## Remember: The Label Is the Law!

This guide is not a substitute for an herbicide's product label. Always read and understand the label. The user of any herbicide is liable for all aspects of handling the product, including mixing, loading, applying, controlling spills and disposal. Protect yourself and the environment by being safe and cautious while using herbicides.

Many factors should be considered when applying herbicides. Timing and growth stage of the plant are highly important. If the area to be sprayed is grazed, limitations on herbicide use may exist. Certain herbicides can cause damage to desirable grasses and forbs. Some herbicides have a residual effect that can hamper re-seeding. Proper surfactant choice is critical for effective use of many herbicides. The herbicide label has all the answers to these questions, this guide has summarized some of those labels.

Tank mixes with 2,4-D or compound herbicides, such as Prescott, may save money and reduce grass injury that can result from a higher use rate of a single herbicide. However, this may result in increased injury to desirable vegetation or decreased efficacy of your target species.

**Signal Words** Indicate the toxicity and/or hazards associated with the use of the pesticide.

- **Caution:** least toxic. 1 to 16 ounces swallowed can be lethal to an adult.
- **Warning:** 1 to 3 teaspoons swallowed can be lethal to an adult.



- **Danger/Poison:** most toxic. 1 to 3 drops swallowed can be lethal to an adult.

## Herbicide Characteristics

This is a list of the brand names that Larimer County Weed District sells. It is not a comprehensive list of herbicide brand names. There are other brand names with the same active ingredients.

\*Dependent on rate  
 \*\* Create slurry with vigorous agitation in a separate container then add to the tank.  
 \*\*\* See Label or supplemental literature from manufacturer.  
 \*\*\*\* Dependant upon species.  
 \*\*\*\*\* Hay needs to stay in the area.

Brand Name Active Ingredient	Use	Signal Word (Toxicity)		Rainfast Period	Hay Harvest	Plant Back Interval Range/ Pasture (months)	Environmental characteristics
		Formulation	Re-entry interval (hours)				
<b>Milestone</b> Aminopyralid	Range/Pasture Rights-of-way	Caution	2	0*****	3+****	Foliar and root uptake • Need nonionic surfactant (1oz/3 gal) • Can be applied to water's edge • Do not apply directly to water • Not for use on irrigation ditch banks • Caution under certain tree species	
		Liquid	12	0			
<b>Telar</b> Chlorsulfuron	Range/Pasture Rights-of-way Industrial	Caution	4	0*	6	Foliar and root uptake • Short term soil activity • Need nonionic surfactant (1oz/3 gal) • Can be applied to water's edge • Do not apply directly to water	
		Dry**	4	0*			
<b>Transline</b> Prescott w/Triclopyr Clopyralid	Range/Pasture Rights-of-way Industrial	Caution Danger	2	0	3+	Primarily foliar with some root uptake • Short term soil activity • Need nonionic surfactant (1oz/3 gal) • Do not apply near water • Can be applied near trees and shrubs	
		Liquid	12	0			

## Herbicide Characteristics

<b>Rangestar, Brash, Rifle D, Weedmaster</b> w/2,4-D <b>E-2</b> w/2,4-D, Fluroxypyr Dicamba	Range/Pasture Rights-of-way Industrial	Danger Warning	4	37-70*	4	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply near water</li> <li>Do not apply near trees and shrubs</li> <li>Do not use on buffalograss</li> <li>Volatile above 85 degrees</li> </ul>
		Liquid	24	0	0	<ul style="list-style-type: none"> <li>Foliar uptake only</li> <li>Need methylated seed oil (1 qt/acre)</li> <li>Do not apply near water</li> <li>Not for use on irrigation ditch banks</li> <li>Do not apply near trees and shrubs</li> <li>Safe to use over newly seeded grasses</li> </ul>
<b>Vista XRT</b> <b>E-2</b> w/2,4-D, Dicamba Fluroxypyr	Range/Pasture Rights-of-way Industrial	Warning	1	7	0	<ul style="list-style-type: none"> <li>Non-selective herbicide</li> <li>Foliar uptake only</li> <li>Usually you do not need to add extra surfactant</li> <li>For aquatic applications need to use an aquatic surfactant</li> <li>Can be applied to water's edge</li> <li>Rodeo and Aquanet can be applied in water</li> <li>Can be applied near trees and shrubs</li> <li>Kills trees if leaves are sprayed</li> </ul>
		Liquid	12	0	0	<ul style="list-style-type: none"> <li>Foliar and root uptake.</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Need to use an aquatic surfactant</li> <li>Can be applied to water's edge, including irrigation ditch banks</li> <li>Caution under certain tree species</li> </ul>
<b>Roundup*</b> <b>Rodeo</b> <b>Aquaneet</b> Glyphosate	Rights-of-way Industrial Aquatic	Caution	1-4	N/A	0	<ul style="list-style-type: none"> <li>Foliar and root uptake.</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Need to use an aquatic surfactant</li> <li>Can be applied to water's edge, including irrigation ditch banks</li> <li>Caution under certain tree species</li> </ul>
		Liquid	4	N/A	-	<ul style="list-style-type: none"> <li>Foliar and root uptake.</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Need to use an aquatic surfactant</li> <li>Can be applied to water's edge, including irrigation ditch banks</li> <li>Caution under certain tree species</li> </ul>
<b>Clearcast</b> Imazamox	Aquatic Grazed areas	Caution	2	N/A	-	<ul style="list-style-type: none"> <li>Foliar and root uptake.</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Need to use an aquatic surfactant</li> <li>Can be applied to water's edge, including irrigation ditch banks</li> <li>Caution under certain tree species</li> </ul>
		Liquid	4	N/A	-	<ul style="list-style-type: none"> <li>Foliar and root uptake.</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Need to use an aquatic surfactant</li> <li>Can be applied to water's edge, including irrigation ditch banks</li> <li>Caution under certain tree species</li> </ul>

## Herbicide Characteristics

<b>Panoramic</b> <b>Plateau</b> Imazapic	Range/Pasture	Caution	1	7	0	<ul style="list-style-type: none"> <li>Foliar and root uptake</li> <li>Short-term soil activity</li> <li>Need nonionic surfactant (1oz/3 gal) if weeds have emerged</li> <li>Do not apply near water</li> <li>This product has runoff potential and should not be used on hillsides sloping toward water</li> <li>Caution under certain tree species</li> <li>High rates can be injurious to cool season grasses</li> </ul>
		Liquid	12	0	0	<ul style="list-style-type: none"> <li>Non-selective herbicide</li> <li>Foliar and root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Persistent in soil, breaks down rapidly in water</li> <li>Can be applied in water</li> <li>Kills trees</li> </ul>
<b>Arsenal*</b> Imazapyr	Range/Pasture Aquatic	Caution	1	N/A	12	<ul style="list-style-type: none"> <li>Preemergent</li> <li>No surfactant needed</li> <li>Do not apply near water</li> <li>Can be applied near trees and shrubs</li> <li>Needs rainfall</li> <li>Maintain agitation during application</li> <li>Do not use it in pastures of timothy, fescues, bluegrass, or perennial rye</li> </ul>
		Liquid	N/A	N/A	24	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Do not apply near trees and shrubs</li> </ul>
<b>Rejuvra</b> <b>Esplanade</b> Indaziflam	Range/Pasture Rights-of-way Industrial	Caution	48 before heavy rain	40*****	12	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Do not apply near trees and shrubs</li> </ul>
		Liquid	12	After rain	1-18*****	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Do not apply near trees and shrubs</li> </ul>
<b>Escort</b> Metsulfuron methyl	Range/Pasture Rights-of-way Industrial	Caution	4	0-3*	4	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Do not apply near trees and shrubs</li> </ul>
		Dry**	4	0-3*	1-18*****	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Do not apply near trees and shrubs</li> </ul>

## Herbicide Characteristics

<b>Lambiant</b> Propoxy-carbazone- sodium	Range/Pasture	Caution	4	7	3	<ul style="list-style-type: none"> <li>Foliar uptake only</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Do not apply directly to water</li> <li>Can be applied near trees and shrubs</li> </ul>
		Liquid	12	-		
<b>Quinstar 4L</b> Quinclorac	Range/Pasture	Caution	6	7	10	<ul style="list-style-type: none"> <li>Foliar and root uptake</li> <li>Need methylated seed oil (1 qt/acre)</li> <li>Do not apply directly to water</li> <li>Can be applied to water's edge</li> <li>Can be applied near trees and shrubs</li> </ul>
		Liquid	12	0		
<b>Garlon 3A</b> <b>Element 3A</b> <b>Garlon 4</b> <b>Element 4</b> <b>Prescott</b> w/clopyralid Triclopyr	Range/Pasture Rights-of-way Industrial Aquatic Industrial	Danger	4	14	1	<ul style="list-style-type: none"> <li>Primarily foliar with some root uptake</li> <li>For aquatic applications need to use an aquatic non-ionic surfactant</li> <li>For the 4 formulation, a Crop Oil Concentrate or an oil mix using diesel fuel, fuel oil or kerosene can be applied to water's edge</li> <li>The 3A formulations can be applied in water</li> <li>Not for use on irrigation ditch banks</li> </ul>
		Liquid	48	0		
<b>Amine 4lb</b> <b>Rangestar, Brash,</b> <b>Rifle D, Weedmaster</b> w/ Dicamba <b>E-2</b> w/Dicamba, Fluroxypyr <b>Freelexx</b> (Choline) <b>2,4-D</b>	Range/Pasture Aquatic Rights-of-way Industrial	Danger Warning Danger	1	30	1	<ul style="list-style-type: none"> <li>Foliar uptake only</li> <li>Need nonionic surfactant (1oz/3 gal)</li> <li>Can be applied to water's edge</li> <li>Some formulations can be applied in water</li> <li>For aquatic applications, you need to use an aquatic surfactant</li> <li>Can be applied near trees and shrubs</li> </ul>
		Liquid	48	0		

## Herbicide Characteristics

The additives listed help the herbicide stick to the leaf and penetrate into the plant. The herbicide label states which one needs to be used. Blue dye allows the applicator to see where they've sprayed.

Brand Name Active Ingredient	Use	Signal Word (toxicity)
<b>Brewer 90-10</b> Non-ionic Surfactant	Range/Pasture Rights-of-way Industrial Aquatic	Warning
<b>MSO</b> Methylated Seed Oil	Range/Pasture Rights-of-way Industrial Aquatic	Warning
<b>Highlight</b> Dye	Rights-of-way Industrial	Caution

## Herbicide Sprayer Calibration

Sprayer calibration determines the amount of water needed to cover a specified area (normally measured gallons per acre, GPA). The entire process of calibration shouldn't take more than 30 minutes per sprayer.

The rate varies depending on pump pressure, spray tip, swath width, and speed. Changing any of these requires the sprayer to be recalibrated. Calibration is important because while applying too little herbicide may be ineffective, applying too much herbicide wastes money, may damage desired vegetation and increases risk to the environment and human health.

Before calibration, check the following to ensure the sprayer is in good working order.

- 1) The pump is at a pressure that results in all nozzles putting out the desired pattern and droplet size.
- 2) Nozzles are not clogged or worn out.
- 3) There are no leaks in your spray system.

What you need to calibrate a sprayer:

- 1) Stop watch
- 2) Measuring tape
- 3) Measuring container with ounce graduations
- 4) Bucket(s)
- 5) Flags
- 6) Calculator
- 7) Pen and paper

For spray systems that have hand held guns or wands and a boom/boomless sprayer, both must be calibrated separately. The GPA may not be the same for both handgun, and boom/boomless sprayers.



## Handgun Sprayer Calibration

This calibrates how fast you, the sprayer, moves the wand.

1. Fill the sprayer tank (at least half full) with water.
2. Measure a calibration plot that is exactly 18.5 ft X 18.5 ft.
3. Pump up sprayer to operating pressure.
4. Spray the plot uniformly while keeping the sprayer pressure consistent.
5. Record the number of seconds required to cover the entire 18.5 ft x 18.5 ft calibration plot.

Number of seconds \_\_\_\_\_

6. Spray into a bucket for the same number of seconds, again keeping the sprayer pressure consistent.

7. Measure and record the number of ounces of water in the bucket.

Number of ounces \_\_\_\_\_

8. Repeat steps 3-7 at least two more times to ensure consistency.
9. Number of ounces of water measured from the bucket is equal to the number of gallons per acre (GPA) the sprayer is delivering.

Average the number of ounces sprayed \_\_\_\_\_ = GPA (gallons per acre)

10. Calculate the number of acres per a tank.

Tank size (gals)/GPA = \_\_\_\_\_ acres/tank

Backpack Sprayer Calibration video:

<https://www.youtube.com/watch?v=waC51BtQX9A>



# Boom or Boomless Sprayer Calibration

## Volume method

1. Fill the sprayer tank (at least half full) with water and pressurize.
2. Measure the distance in inches between the nozzles. If using boomless nozzles measure the distance they spray out in feet.  
Nozzle spacing (inches) \_\_\_\_\_ or Nozzle spraying (feet) \_\_\_\_\_
3. Calculate Travel Distance (feet)  
Nozzle spacing (inches)/12 = Nozzle spacing (feet) \_\_\_\_\_  
 $340/\text{Nozzle spacing (feet)} = \text{Travel Distance (feet)}$  \_\_\_\_\_
4. Measure your travel distance in the field.
5. Drive through the measured distance at your normal spraying speed, record the travel time in seconds. Repeat this procedure and average the measurements.  
Number of seconds \_\_\_\_\_ Average \_\_\_\_\_ secs
6. With the sprayer parked, hang a bucket off each of the nozzles to catch the output. Turn on the sprayer for the average number of seconds that was calculated in the above step.
7. Pour each of the buckets into a measuring container. If nozzle output is drastically different from the others it may need to be cleaned or replaced. Average the output by adding the individual outputs and then dividing by the number of nozzles tested. The final average nozzle output in ounces is equal to the application rate in gallons per acre (GPA).  
N1 \_\_\_\_\_ N2 \_\_\_\_\_ N3 \_\_\_\_\_ N4 \_\_\_\_\_ N5 \_\_\_\_\_ N6 \_\_\_\_\_ ounces  
Average number of ounces \_\_\_\_\_ = GPA (gallons per acre)
8. Calculate the number of acres per a tank.  
 $\text{Tank size (gals)}/\text{GPA} = \text{_____ acres/tank}$

How to Calibrate a Boom Sprayer: 1/128 of an acre method video:  
<https://www.youtube.com/watch?v=-U3yd0kxRR0>

# Stationary method

1. On level ground, fill the sprayer tank with water and drift agent (if using) and pressurize sprayer.
2. Turn on the sprayer and measure the spray pattern width.  
Spray Width \_\_\_\_\_ feet
3. Collect liquid from each nozzle for 1 minute and combine measurement.  
All Nozzles output \_\_\_\_\_ ounces
4. Divide ounces by 128 to determine GPM (Gallons Per Minute).  
GPM \_\_\_\_\_
5. Determine speed (MPH) you will be using during spraying.  
MPH \_\_\_\_\_
6. With the below formula calculate GPA (Gallons Per Acre).  
 $\text{GPA} = \text{GPM} \times 495$   
 $\text{MPH} \times \text{swath width (feet)}$   
GPA \_\_\_\_\_
7. Calculate the number of acres per a tank.  
 $\text{Tank size (gals)}/\text{GPA} = \text{_____ acres/tank}$



# I've Calibrated My Sprayer, Now What?

On the herbicide label it states the recommended rate (product quantity per an Acre) needed to control a target weed species. Example: On the Milestone label it recommends 5 to 7 oz/A to treat Canada thistle. The table below is for your use to keep track of how much herbicide to add to your equipment.

Equipment	Acres/tank (from calibration)	Weed	Herbicide	Herbicide Rate (from label)	Product to add to tank (rate x acres/tank)

**Conversions:**

- 1 ounce (dry) = 28.35 grams
- 1 gram = 0.24 teaspoons
- 16 ounces = 1 pound
- 1 fluid ounce = 2 tablespoons = 6 teaspoons
- 8 fluid ounces = 1 cup
- 2 cups = 1 pint
- 2 pints = 1 quart
- 4 quarts = 1 gallon = 128 ounces
- 1 acre = 43,560 square feet

## Glossary

**Alien plant:** A plant species that is not indigenous to the state of Colorado.

**Allelopathic:** The inhibition of growth in one plant species by chemicals produced by another.

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

**Biennial:** A plant that requires 2 growing seasons to complete life cycle. They typically germinate in late summer, over-winter, flower, and set seed by mid-summer of the following year.

**Bolt:** The initial stem arising from rosette leaves as a plant matures. The term 'bolting' is often used to describe the growth stage between rosette and flowering.

**Bracts:** A small leaf-like structure below the flower.

**Bud:** An undeveloped or embryonic shoot that develops into flowers or stems.

**Containment:** Defined in the Colorado Noxious Weed Act, maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely uninfested regions where eradication activities prevail.

**Crown:** The crown of shrubs, perennials, and annuals is the area where the stems join the root. Roots grow down from the plant crown and stems grow up.

**Eradication:** Defined in the Colorado Noxious Weed Act, reducing the reproductive success of a noxious weed species or specified noxious weed population in largely uninfested regions to zero and permanently eliminating the species or population within a specified period of time. Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted.

**Invasive species:** An introduced organism that becomes overpopulated and harms its new environment.

**List A:** Defined in the Colorado Noxious Weed Act, rare noxious weed species that are subject to eradication wherever detected statewide in order to protect neighboring lands and the state as a whole.

**List B:** Defined in the Colorado Noxious Weed Act, widespread and well-established noxious weed species for which control is recommended but not required by the state, although local governing bodies may require management.

**List C:** Defined in the Colorado Noxious Weed Act, management is recommended by the state but not required unless designated a noxious weed by local land managers.

**Lobed:** The plant's leaves are divided by indentations.

**Monoculture:** An area dominated by one plant species.

**Nodes:** Are located on the plant's stem where leaves or buds grow out of.

**Native plant:** A plant that is indigenous to Colorado.

**Noxious weed:** Defined in the Colorado Noxious Weed Act, as an alien plant that have been designated by rule as being noxious, 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 the plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.

**Ornamental:** A plant grown by nurseries with decorative traits desirable for landscaping, such as flower color, drought tolerance, shading, etc.

**Perennial:** A plant that lives more than 2 years.

**Raceme:** An unbranched group of flowers with a stem attaching to its axis.

**Riparian:** Areas that normally have moist to wet soils, such as transitional zones between aquatic ecosystems and uplands.

**Rosette:** A circular arrangement of leaves that usually sit near the soil. It is typical of the early growth stage of many biennial plant species.

**Seedling:** A newly germinated plant, not yet mature.

**Spikes:** An unbranched group of flowers directly attached to a single stem as its axis.

**Suppression:** Defined in the Colorado Noxious Weed Act as reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigation the negative effects of noxious weed populations on infested lands. Suppression efforts may employ a wide variety of integrated management techniques.

**Taproot:** A large, central, and dominant root from which other roots sprout laterally.

**Winter annual:** A plant which germinate in late summer or fall and then complete its life cycle by the following spring or summer (ex. cheatgrass, tumble mustard).

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### Weed Free Forage Directory

<https://ag.colorado.gov/conservation/weed-free-forage>

**For additional resources visit [larimer.gov/weeds](http://larimer.gov/weeds)**





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## Notes:



LARIMER  
COUNTY

NATURAL RESOURCES



Larimer County Land Stewardship Program

970-498-5768

[DNR\\_WeedDistrict@larimer.org](mailto:DNR_WeedDistrict@larimer.org)

[www.larimer.org/weeds](http://www.larimer.org/weeds)