Colorado State Parks

COLORADO STATE PARKS
BEST MANAGEMENT PRACTICES
WEED PROFILE

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Parks Affected: All

Bull thistle

Cirsium vulgare (Savi) Tenore

BMPs

Family: Asteraceae (Composite)
Other Names: common thistle, spear thistle, fuller's thistle
USDA Code: CIVU
Legal Status: Colorado Noxious List A (general weeds)

Keys to Identification:

- Bull thistle can be distinguished from other thistles by rubbing the upper surface of its leaves. Bull thistle leaves are prickly hairy above and cottony below.
- Bull thistle has stiff pointy spines on its leaf tips and spine-tipped, purple flower heads.

Identification

Growth form: Biennial forb.
Flower: Flowers are 1.5-2 inches wide and clustered at the ends of branches. The flower bracts are somewhat tapered and covered with spines (Whitson et al. 1996). Flowers are pinkish to dark purple.
Seed/Fruit: Seeds are capped with a circle of plume-like white hairs.
Leaves: Leaves are alternate. Bull are the only thistles in Colorado that are prickly hairy on the top surface of the leaves. They are cottony-hairy on the undersides.
Stems: In mature plants the leaves extend down, clasping the stem and are divided into segments (i.e. strongly decurrent).
Roots: Has a short, fleshy taproot with several primary roots extending from the root crown. Each bears a number of smaller lateral roots.
Seedlings: Seed leaves (cotyledons) are round to spatulate, and smooth. First true leaves are oval to spatulate with spines and a rough, bumpy surface (Carey et al. 1993). First year plants form a rosette with leaves easily distinguished from other thistles by the above leaf characteristics.
Other: Mature plants range between 2-5 feet tall with many spreading branches and (Whitson et al. 1996).

Similar Species

Exotics: Bull thistle is similar to other thistles (*Breea, Carduus, Cirsium* and *Onopordum* genera) but can be distinguished by flower size, bract appearance and leaf surfaces. In rosette form it can be readily distinguished by the prickly upper surface of its leaves.
Natives: There are many native *Cirsium* species, some common (like *Cirsium undulatum*) some rare (like *Cirsium perplexans*). The natives generally do not have leaves clasping the stem all the way from node to node (strongly decurrent leaves), and many have hairy upper and lower leaf surfaces and are blue-green or gray in color.

Impacts

Agricultural: Heavy infestations can exclude livestock from areas. Additionally, the presence of bull thistle in hay decreases the forage value and lowers the market price (Zimmerman 1997). It is an aggressive weed, but it will not survive where cultivation has cut back its stem and destroyed its root system (FEIS 1996).

Ecological: Bull thistle is often a transient species, appearing in recent clear cuts or disturbed areas and becoming a dominant species for several years (Rees et al. 1996).

Human: Bull thistle has been reported to cause hay fever in some individuals (FEIS 1996).

Habitat and Distribution

General requirements: Bull thistle grows in dry to moist habitats. It thrives on nitrogen-rich soils, and it grows on gravelly to clay-textured soils. Bull thistle cannot withstand deep shade, and is nearly absent if light is reduced to less than 40% of full sunlight (FEIS 1996). Potential habitats include pastures, overgrazed rangeland, roadsides, and logged areas.

Distribution: Distribution within Colorado is not well known, but it is certainly found along the Front Range, as well as throughout the Western Slope (A. Green, pers. comm.) In Colorado, bull thistle is most often found between 5,000-10,800 feet in elevation. It is widespread throughout the United States and parts of Canada.

Historical: Bull thistle was introduced to North America as a seed contaminant and is now widespread.

Biology/Ecology

Life cycle: During the first year following germination a basal rosette is formed. The rosette grows until winter, partly dies back, and begins to grow again in early spring (FEIS 1996). Age at bolting is dependent upon plant size and almost all plants require a period of cold temperature to bolt. Flowering occurs from July through September. After flowering and seed production, the plant dies.

Mode of reproduction: Bull thistle reproduces solely by seeds.

Seed production: Mature plants can produce up to 4,000 seeds per plant (Zimmerman 1997).

Seed bank: Seeds have little dormancy, and germinate rapidly whenever conditions are favorable, usually in the spring and fall (FEIS 1996). Although most of the seeds on or near the surface do not remain viable for more than a year, seeds that are buried at a depth of 5 inches may remain viable for up to three years (Zimmerman 1997).

Dispersal: Seeds are capped with a circle of plume-like white hairs and can be windblown for long distances. However, it has been found that 65% of the seeds land within two meters of the parent plant (Zimmerman 1997). Seeds are also likely to be spread by birds, especially goldfinches.

Hybridization: There is no information available on hybridization with other thistles.

Control

Biocontrol: The bull thistle seedhead gall fly (*Urophora stylata*) can reduce seed production up to 80% in some areas (Zimmerman 1997). This agent has been established in Colorado, and prefers open meadows (Rees et al. 1996). However, this species is currently unavailable for redistribution by the Division of Plant Industry's Biological Pest Control Section. Due to its spiny stems and leaves, bull thistle is unpalatable to most livestock (FEIS 1996). However, sheep will graze on bull thistle seedlings or small rosettes.

Keys to Control:

- Kill bull thistle plants after they have bolted, but before plants have flowered.
- Repeat control for several years to deplete the bank of thistle seeds in the soil.

Mechanical: Cutting, mowing, and/or severing the taproot just below the root crown before seed set will eliminate current year seed production, and if continued annually, eliminate an infestation. The best time to cut is late in the season when most of the plants have bolted, but before a significant number have flowered (FEIS 1996). Plants will re-bolt if they are mowed too early. Cutting again a month after the first sweep will eliminate any late bolting plants, and improve the effectiveness of the procedure.

Fire: No information available.

Herbicides: Spot applications of picloram at 0.5 lb., dicamba or 2,4-D at 1 lb. ai/acre will provide effective control. Glyphosate at 1.5 lb. ai/acre is another herbicide that can be used to provide some control of bull thistle. Herbicides should be applied in rosette stage or after mowing as the plant becomes more tolerant of herbicides once the flower stalk is produced (FEIS 1996).
Cultural/Preventive: Minimize disturbance and establish healthy stands of tall grasses or forbs to outcompete bull thistle.

Integrated Management Summary

Bull thistle does not tolerate shade and therefore does not compete well in areas that are populated by tall grasses and forbs. Improving the health of a natural area, and guarding against disturbance or overuse, can be a good preventive measure against bull thistle. Apply herbicides to rosettes in early spring (May, June), and then mow or sever taproots after the plants have bolted but before flowering (probably late June to July). A second mowing or cutting is suggested a month later to pick up late bolting plants. Do not cut or spray if using seedhead biocontrols.

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