Cirsium vulgare (Savi) Ten.

Bull thistle

Family: Asteraceae
Range: Found in every state in the U.S.
Habitat: Disturbed areas including rangeland, pastures, forest clearcuts, roadsides and waste areas. Also occurs in foothills, dry meadows and riparian areas.
Origin: Native to Europe.
Impact: Bull thistle is not palatable to livestock and reduces the forage potential of infested pasture and rangeland. Once established, it can outcompete native plants. Although common, bull thistle is generally not considered as problematic as musk or Scotch thistle.
Western states listed as Noxious Weed: California, Colorado, New Mexico, Oregon, Washington
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Bull thistle is usually a biennial, but sometimes an annual or monocarpic perennial. It can grow up to 7 ft in height, but 2 to 6 ft is more common. Rosettes up to 3 ft in diameter form the first year. Leaves are 3 to 12 inches long, deeply lobed with coarse prickly hairs on the top and woolly hairs underneath. Leaves have sharp spines along the midrib and at the tip of the lobes, with the tip resembling a spear. Plants can have spreading branches, and sometimes a single stem. Stem have spiny wings that run down the length of the stem. Bull thistle requires vernalization before bolting.

Plants produce solitary (or sometimes clustered) pink-magenta flowerheads at the end of each stem. They are 1.5 to 2 inches wide and 1 to 2 inches long. Large spiny bracts surround the seedheads. Bull thistle reproduces and spreads entirely from seeds. Under favorable conditions, plants can produce 100 to 300 seeds per flowerhead or more, with 1 to more than 400 flowerheads per plant. Seeds have a feathery pappus that detaches at maturity, so seeds usually do not travel great distances by wind. Most seeds fall within a few feet of the parent plant. Seeds germinate in fall or spring depending on soil moisture. Most seeds either germinate or die within the first year, but seeds buried to about 6 inches or deeper may survive for up to 3 years or more.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Tillage, hoeing, and hand pulling are effective as long as they are done before flowering to prevent seed production. Any mechanical or physical control measure that severs the root below the soil surface is very effective. The plant must be cut off below the soil surface and no leaves should remain attached, or the plant will recover. Mowing is only effective when done either immediately before flowering or when plants are just starting to flower. Mowing too early only delays flowering, while mowing too late may allow production of viable seed. Because there can be a wide variation in the maturity of plants, a single mowing is generally insufficient because some seed will still be produced. Repeated mowing throughout the growing season is a more successful approach.
Cultural	The ability of thistles to invade pastures can be changed by grazing management, primarily by changing the competitiveness of the desirable pasture species. Sheep, goats, and horses, but not cattle, will eat young plants and can have a significant effect on thistles in the early stages of an infestation. Goats tend to avoid bull thistle foliage but eat the flowerheads, which can completely prevent seed dispersal from mature plants. Light grazing by sheep may selectively reduce competition from neighboring plants, increasing

	seedling survival, growth, flowering and seed production in bull thistle. It is unclear whether fire will completely kill bull thistle. Only mature thistle plants may readily combust and their seed may already be dispersed. Fire can create conditions that favor the establishment of bull thistle, so colonization after a fire may be enhanced. Burning can be used to remove above-ground material once it dries in late summer to fall. This can facilitate subsequent herbicide applications. Burning may also encourage the seedbank to flush, providing an opportunity for seedling control.
Biological	The bull thistle gall fly (*Urophora stylata*) was released as a biocontrol agent in the Pacific Northwest, as was the thistle head weevil, *Rhinocyllus conicus*. *Urophora* is not established in California yet and has little impact elsewhere. *R. conicus* is widely established in the western United States and attacks many thistle species, including some native species. A weevil, *Trichosirocalus horridus*, was introduced to the U.S. in 1974 to control musk thistle and other thistles. Reports of its effectiveness vary.

CHEMICAL CONTROL

The following specific use information is based on published papers and reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

GROWTH REGULATORS	
2,4-D Several names	**Rate:** 1.6 to 2.1 qt product/acre (1.5 to 2 lb a.e./acre) **Timing:** Postemergence at rosette stage. Treat seedling rosettes in fall. **Remarks:** 2,4-D is broadleaf-selective and has no soil activity. It may require repeat applications. 2,4-D is generally not the most effective treatment, but is widely used because of low cost. Use a surfactant. When using the ester formulation do not apply when outside temperatures exceed 80°F.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 4.75 to 8 oz product (*Perspective*)/acre **Timing:** Postemergence and preemergence. Postemergence applications are most effective when applied to plants from the seedling to the bolting stage. **Remarks:** *Perspective* provides broad-spectrum control of many broadleaf species. Although generally safe to grasses, it may suppress or injure certain annual and perennial grass species. Do not treat in the root zone of desirable trees and shrubs. Do not apply more than 11 oz product/acre per year. At this high rate, cool-season grasses will be damaged, including bluebunch wheatgrass. Not yet labeled for grazing lands. Add an adjuvant to the spray solution. This product is not approved for use in California and some counties of Colorado (San Luis Valley).
Aminopyralid *Milestone*	**Rate:** 3 to 5 oz product/acre (0.75 to 1.25 oz a.e./acre) **Timing:** Postemergence in spring to early summer when the target plants are in the rosette to bolting stage, or in fall to seedlings. **Remarks:** Aminopyralid is a broadleaf herbicide similar to picloram, but more selective and generally safe on grasses. Its soil residual activity will kill emerging seedlings. Aminopyralid has a longer soil residual and higher activity than clopyralid. Aminopyralid can also be used in a premix with 2,4-D (*Forefront HL*) at 1.2 to 1.5 pt product/acre for bull thistle control.
Clopyralid *Transline*	**Rate:** 0.67 to 1.33 pt product/acre (4 to 8 oz a.e./acre) **Timing:** Postemergence in spring up to the bud stage. Can also apply to fall regrowth. Results are best if applied to rapidly growing weeds. **Remarks:** Clopyralid is a broadleaf herbicide like picloram, but more selective. It is very safe on grasses.
Dicamba *Banvel*, *Clarity*	**Rate:** 1 to 2 pt product/acre (0.5 to 1 lb a.e./acre) **Timing:** Postemergence to rosettes in spring. Fall applications help control seedling rosettes. **Remarks:** Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It is also effective when tank-mixed with 2,4-D (0.75 lb a.e./acre of dicamba + 0.25 lb a.e./acre of 2,4-D). Avoid drift to sensitive crops. Do not apply when outside temperatures exceed 80°F. Dicamba is available mixed with diflufenzopyr in a formulation called *Overdrive*. This has been reported to be effective on bull thistle. Diflufenzopyr is an auxin transport inhibitor which causes

	dicamba to accumulate in shoot and root meristems, increasing its activity. *Overdrive* is applied postemergence at 4 to 8 oz product/acre on rapidly growing plants. Higher rates should be used on large annuals and biennials. Add a non-ionic surfactant to the treatment solution at 0.25% v/v or a methylated seed oil at 1% v/v solution.
Picloram *Tordon 22K*	**Rate:** 0.5 to 0.75 pt product/acre (2 to 3 oz a.e./acre) **Timing:** Postemergence during active growth before bud stage. **Remarks:** Picloram is one of the most effective herbicides for bull thistle control. Most broadleaf plants are susceptible, but relatively safe on established grasses. It is also effective when mixed with dicamba or 2,4-D. Picloram has long soil residual activity and has been reported by some to injure young or germinating grasses. Picloram can also be used in a premix with 2,4-D (*Grazon P+D*) to give control of bull thistle. Picloram products are federally restricted use pesticides. Picloram and its formulations are not registered for use in California.
Triclopyr *Garlon 3A*, *Garlon 4 Ultra*	**Rate:** 0.33 to 1.5 gallons *Garlon 3A*/acre or 0.25 to 1 gallons *Garlon 4 Ultra*/acre (1 to 4.5 lb a.e./acre) **Timing:** Postemergence to rapidly growing weeds, up to bud stage. **Remarks:** Triclopyr is broadleaf-selective and safe on most grasses. It is most effective on smaller plants. *Garlon 4 Ultra* is formulated as a low volatile ester. However, in warm temperatures, spraying onto hard surfaces such as rocks or pavement can increase the risk of volatilization and off-target damage. Recommended rates are based on those reported for perennial thistles. Triclopyr can also be used in a premix with 2,4-D (*Crossbow*) or clopyralid (*Transline*).
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron *Telar*	**Rate:** 1 oz product/acre (0.75 oz a.i./acre) **Timing:** Postemergence to young rapidly growing weeds. **Remarks:** Chlorsulfuron provides residual control 1 year after treatment. It has mixed selectivity, but is generally safe on grasses. Always use a surfactant. 2,4-D at 1 to 2 pt product/acre can be tank-mixed with chlorsulfuron for quicker burndown.
Imazapyr *Arsenal*, *Habitat*, *Stalker*, *Chopper*, *Polaris*	**Rate:** Broadcast treatment: 4 to 6 pt product/acre (1 to 1.5 lb a.e./acre). Spot treatment: 1% v/v solution **Timing:** Postemergence at flowering. **Remarks:** Imazapyr is best used as a spot treatment. It is a nonselective herbicide. It also has long soil residual activity and can leave more bare ground than other treatments, even a year after application. Recommended rates are based on those reported for perennial thistles.
Metsulfuron *Escort*	**Rate:** 1.5 to 2 oz product/acre (0.9 to 1.2 oz a.i./acre) **Timing:** Postemergence to young, rapidly growing weeds in spring before flowering, or in fall to new rosettes. **Remarks:** Metsulfuron has mixed selectivity, but is generally safe on grasses. Use a surfactant. It can be tank-mixed with 2,4-D or aminopyralid. *Opensight* is a premix of aminopyralid and metsulfuron; use at 1 to 2.5 oz product/acre. Metsulfuron has some soil residual activity. Recommended rates are based on those reported for perennial thistles. Metsulfuron and its formulations are not registered for use in California.

RECOMMENDED CITATION: DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.