



King County

Department of Natural Resources and Parks
Water and Land Resources Division
Noxious Weed Control Program
206-296-0290 TTY Relay: 711

BEST MANAGEMENT PRACTICES

Bull thistle—*Cirsium vulgare* Asteraceae

Non-Designated Noxious Weed

Legal Status in King County: Non-Designated Class C Noxious Weed (non-native species that can be designated for control under State Law RCW 17.10 based on local priorities). The King County Noxious Weed Control Board does not require property owners to control bull thistle, but control is recommended.

BACKGROUND INFORMATION



Impacts and History

- A common weed of roadsides, pastures, vacant fields, burned areas, and logged areas.
- Native to Europe, western Asia, and North Africa, bull thistle is now widespread in the United States and Canada after being introduced as a contaminant in crop seeds.
- Common in overgrazed pastures where it may form dense stands that reduce productivity and stocking levels.
- May dominate forest clear cuts and reduce growth of tree seedlings.

Description

- As a biennial, bull thistle has a two-year life cycle. Plants grow vegetatively their first year as rosettes of green, sparsely hairy leaves. The flowering stems elongate and flower in the second year. The plants die after flowering or after the first frost.
- Flowering stems reach 2 - 5 ft in height. The heads of purple flowers are 1.5 - 2 in wide and are located at the branch ends. The flower head bases are covered in spine-tipped bracts.
- The upper leaf surfaces are sparsely hairy with short prickles on the leaf surfaces and cottony hairs on the leaf undersides. There are sharp spines on the leaf margins and leaf tips.

Habitat

- Prefers full sun and cannot tolerate shade.
- Common in recently or repeatedly disturbed areas,



especially pastures, overgrazed rangelands, roadsides and logged areas. Can become a dominant species following disturbance.

Reproduction and Spread

- Plants can flower from June until the first frost.
- Mature plants can produce up to 4,000 seeds per plant. Seeds are capped with a circle of white hairs and can be windblown for long distances; however, most fall within only a few feet of the parent plant.
- Bull thistle reproduces only by seed.
- Seeds usually germinate in the spring and fall. The seeds are short-lived and most on or near the soil surface do not remain viable for more than a year. Seeds buried at a depth of 5 inches may remain viable for up to three years. Tilling, grazing or other soil disturbance may cause these seeds to germinate.

Local Distribution

Bull thistle is widespread in King County. While primarily found in rural pastures and fields, it is also found in vacant urban lots and throughout the county along city, county and state roads.

CONTROL INFORMATION

Integrated Pest Management

- The preferred approach for weed control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic and social impacts.
- Use a multifaceted and adaptive approach. Select control methods that reflect the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication over a number of years, and should allow for flexibility in method as appropriate.

Planning Considerations

- Survey area for weeds, set priorities and select best control method(s) for the site conditions and regulatory compliance issues (**refer to the King County Noxious Weed Regulatory Guidelines**).
- Bull thistle reproduces entirely by seed, so a successful management program must focus on preventing seed production.
- Small infestations can be effectively hand-pulled or dug up. Isolated plants should be removed in order to prevent them from infesting a larger area.

- For larger infestations, the strategy will depend on the land use of the site. In pastures, for example, good grazing practices and management of grass and forage species will reduce bull thistle infestations. Specific suggestions are given in the Best Management section.
- Generally work first in least infested areas, moving towards more heavily infested areas.
- Minimize soil disturbance to avoid creating more opportunities for seed germination.

Early Detection and Prevention

- Dig up isolated or small populations before the infestation spreads. If there are more rosettes than can be removed manually, it may be necessary to treat the area with an appropriate herbicide in the fall or spring.
- Bull thistle does not compete well in areas with thick, tall grasses and forbs. Preserving the health of a natural area and preventing disturbance or overuse are good preventative measures against bull thistle.
- Manage grazing areas to promote grass and clover vigor. Graze uniformly and move animals from area to area in a planned sequence. Avoid grazing when soil is very wet to minimize soil disturbance.
- Prevent seeds from spreading to other un-infested areas by washing vehicles, equipment, boots and animals that have been in infested areas.
- If animals are being moved from an infested pasture to an un-infested pasture, if possible, first isolate them for at least five days so that the seeds pass out of the animals' digestive system.

Manual

- Pull or cut the plants after they bolt but before they flower. For best effectiveness, cut about an inch below the soil surface. This stops the plant from re-sprouting. Plants may re-sprout if cut at or above the soil surface.
- Plants in flower can form viable seeds even after removal, so carefully bag and dispose of all flowering plants.
- In areas where mature plants are removed, there are usually many small rosettes left in the area. Search the area for rosettes and dig them up or remove with a hoe. Removing plants is easiest when the soil is loose or wet.
- Return to the same location in the following spring and summer to remove plants coming up from seeds already in the soil. Continue to monitor the area for several years.
- Hand pulling and the use of hand mechanical tools are allowable in all critical areas in unincorporated King County.
- Do not remove plants or seed heads if your management program relies on seed head biological control organisms.

Mechanical

- Mowing plants may prevent seed production when done at the pre-flower stage. Avoid mowing plants in full flower, as cut flowers may still form viable seeds.
- Mowing may need to be repeated throughout the season to prevent re-flowering.

- Cultivation will effectively control bull thistle.

Chemical

- Herbicides should only be applied at the rates and for the site conditions and/or land usage specified on the label. **Follow all label directions.**
- Herbicides may be used in accordance with Federal and State Law in critical areas and their buffers with certain restrictions. Refer to the **King County Noxious Weed Regulatory Guidelines** for a summary of current restrictions and regulatory compliance issues.
- Apply herbicide on warm, dry days when winds are low. Check the product label for specific information on wind and rain guidelines. Treated areas should not be mowed or cut until after the herbicide has had a chance to work.
- The addition of a suitable surfactant may improve control results.
- For several years following treatment, monitor areas for new plants germinating from the seed bank.

Specific Herbicide Information

Glyphosate: Herbicides containing glyphosate can effectively control bull thistle. Glyphosate will also kill grasses that compete with bull thistle, so treatment with glyphosate should be combined with effective re-vegetation of the site to prevent thistle seedlings from re-infesting the area.

Selective Broadleaf Herbicides (such as triclopyr, 2,4-D, dicamba and aminopyralid):

Selective herbicides that are effective on bull thistle include 2,4-D (many products), dicamba (e.g. Vanquish or Banvel), a combination of 2,4-D and dicamba (e.g. Weedmaster or Brash) or aminopyralid (Milestone). Selective herbicides are preferred over non-selective herbicides when applying in a grassy area.

Selective broadleaf herbicides are effective when applied to the rosettes during periods of active growth. These periods occur in the spring, before stem elongation, and in the fall. Continue to monitor the area for new plants for at least four years after the initial treatment and following any disturbance to the soil such as tilling or construction. **NOTE: Certain additional restrictions apply for products containing triclopyr BEE (e. g. Garlon 4, Crossbow). Refer to the King County Noxious Weed Regulatory Guidelines for more details.**

The mention of a specific product brand name in this document is not, and should not be construed as an endorsement or as a recommendation for the use of that product.

Chemical control options may differ for private, commercial and government agency users. **For questions about herbicide use, contact the King County Noxious Weed Control Program at 206-296-0290.**

Biological

- The bull thistle seed head gall fly (*Urophora stylata*) lays eggs on closed flower buds in June and July. After hatching, the larvae burrow into the seed-producing tissues to feed, forming galls and reducing seed production. Often, multiple larvae are needed to completely prevent seed production.
- The bull thistle seed head gall fly was first released in the United States in Washington State in 1983. It is now established in Oregon State and has a limited distribution in Washington State. Control of seed production is effective where the population of gall flies is high.
- Biological control agents may take several years after release to have a significant impact on the infestation. Population density and the number of flowering plants can be reduced but there will always be some plants remaining when using biological control agents.
- Biological control agents are not recommended or prescribed for small infestations.
- Goats will eat seedlings, rosettes, and flower heads. If appropriate for site conditions, they may be used to reduce bull thistle infestations.

SUMMARY OF BEST MANAGEMENT PRACTICES

Small Infestations in Native and/or Desirable Vegetation

- Mark all desirable vegetation in control area, so that no native plants are removed.
- Dig or hoe rosettes or cut plants about an inch below the soil surface after flower stems elongate. Minimize soil disturbance by replacing or re-seeding any bare spots created when removing the plants.
- A layer of mulch on the soil surface may inhibit the germination of new seedlings.
- Apply appropriate herbicide by spot spray or wick wiping to minimize injury to desirable plants.
- If using an herbicide in a grassy area, use a selective herbicide to avoid injury to the grass.
- Monitor site throughout growing season and remove any new plants.

Large Infestations/Monocultures in Grassy Areas

- Mowing can be an effective control for pre-flower plants. Do not mow bull thistle that is in full flower or that has gone to seed.
- Large infestations can be controlled with the appropriate herbicides. (See the Chemical section of this BMP).
- Application of a selective herbicide followed by good pasture management will greatly increase grass production. Thick grass will suppress bull thistle re-growth. Promote healthy grass areas by seeding and fertilizing according to the soil needs, and then manage future grazing so that 4 to 6 inches of grass growth remains at the end of the growing season. For more information on pasture management, contact the King Conservation District (<http://www.kingcd.org>).

- Monitor for bull thistle on edges of pastures and disturbed areas around fences and watering holes. Remove isolated plants before they flower

Control in Riparian Areas

- Survey area and document extent of infestation.
- Focus on manual removal for small infestations.
- For larger areas where herbicide use is warranted, wick wiping or spot spray (if appropriate) using low pressure and large droplet size.
- Pay particular attention to regulatory compliance issues for aquatic areas described in the King County Noxious Weed Regulatory Guidelines.
- Prevent or mitigate for soil erosion near riparian areas. When large areas of weeds are removed, the cleared area should be replanted with native or non-invasive vegetation and stabilized against soil erosion.
- Infested areas will need to incorporate a management plan lasting for several years to control plants germinating from the seed bank.

Control Along Road Rights-of-Way

- Repeated mowing will prevent flowering and seed production of bull thistle.
- Spot spray with glyphosate if the weeds are in areas without desirable grasses.
- If plants are in grassy areas, spot spray with a selective broadleaf herbicide. If controlled with a non-selective herbicide, re-seed the area after control is completed.

References

Coombs, E.M., Clark, J.K, Piper, G.L., and A.F. Cofrancesco Jr. (editors). 2004. Biological Control of Invasive Plants in the United States. Oregon State University Press, Corvallis, Oregon.

Forcella, F. and J.M. Randall. 1994. Biology of Bull Thistle, *Cirsium vulgare* (Savi) Tenore. Reviews of Weed Science 6:29-50.

Klinkhamer, P.G.L, and T.J. DeJong. 1993. *Cirsium vulgare* (Savi) Ten.: (*Carduus lanceolatus* L., *Cirsium lanceolatum* (L.) Scop., non Hill). Journal of Ecology 81: 177-191.

Pacific Northwest Weed Management Handbook. 2006. Oregon State University, Corvallis, Oregon.

Zimmerman, J.A.C. 1997. Ecology and distribution of *Cirsium vulgare* (Savi) Tenore, Asteraceae. USGS Colorado Plateau Field Station, Southwest Exotic Plant Mapping Program. <http://www.usgs.nau.edu/SWEPIC/swemp/swempa.asp>.