

H a w k w e e d s

Hieracium spp.
Asteraceae

**Class A, B, and C Noxious Weeds
Control Required**

Legal Status in King County: All non-native invasive hawkweed species are listed as noxious weeds on the Washington State Noxious Weed List, as authorized under Washington State Noxious Weed Law, RCW 17.10. The King County Noxious Weed Control Board requires all private and public property owners to control and prevent the spread of all invasive non-native hawkweed species on their property. Eradication is required by state law for hawkweeds on the Class A list. Control is required for hawkweeds on the Class B and C lists (control is defined by state law as the prevention of all seed production). **European hawkweed** and **yellow-devil hawkweed** are Class A noxious weeds; **mouseear, orange, polar, queen-devil, smooth** and **yellow hawkweed** are Class B noxious weeds; and **common hawkweed** and all non-native invasive hawkweed species not otherwise listed, including **tall hawkweed**, are Class C noxious weeds. State quarantine laws prohibit transporting, buying, selling, or distributing plants, plant parts or seeds of mouse-ear, orange, yellow, and yellow devil hawkweed.



Orange hawkweed

BACKGROUND INFORMATION

Impacts and History

- When hawkweeds form monocultures by establishing a dense mat of plants, they lower biodiversity and reduce the forage value of grasslands for grazing animals.
- As a result of prolific seed and stolon production each season, hawkweeds are successful competitors, crowding out native, ornamental, pasture and crop species.
- Hawkweeds were introduced to the United States from Europe as herbal remedies and ornamentals.
- Mouseear hawkweed was introduced in Michigan in 1861, orange hawkweed was introduced before 1818 as an ornamental and several of the other hawkweeds were introduced to the United States around 1879. Reports of non-native hawkweeds in Washington began in 1969.



Yellow hawkweed

Description

- Hawkweeds hybridize freely with native and non-native species, and are very difficult to identify to species.
- Hawkweeds are all perennials in the sunflower family with milky juice, yellow or orange dandelion-like flower heads and are bristly-hairy overall.
- Plants have rosettes of strap or lance-shaped leaves at the base of the stem. Basal leaves of most non-native hawkweeds usually persist through flowering.
- Many non-native hawkweeds have stolons (runners), allowing for aggressive vegetative reproduction.
- Native Washington hawkweed species do not have stolons. However, some non-native hawkweeds do not have stolons either.
- **Description of Specific Hawkweeds:**
 - **European hawkweed** (*H. sabaudum*) is a robust yellow flowered hawkweed with multiple, stout leafy stems up to 4 feet tall from a single root crown, a candelabra-shaped flower arrangement of many small flowerheads, leaves densely packed on the stem especially lower down and getting smaller and less dense up the stem, and coarsely toothed leaves that are tapered and narrower at the base. The lower portion of stem has long, white hairs. This hawkweed flowers later in the summer than most other hawkweeds, usually July to October.
 - **Yellow devil hawkweed** (*H.x floribundum*) has mostly leafless, hairy stems usually 12 to 24 inches tall, basal leaves that are dark green, narrow, glaucous (waxy coating), smooth on top and somewhat bristly hairy below on the midrib and along the leaf edges, many slender, leafy stolons, and a deep rhizome. Stems have black, bristly hairs. 5-50 small flower heads are yellow to whitish yellow and cluster at the top. Ray petals are square-tipped, from ½ to 1 inch long. Blooms from June to August.
 - **Mouseear hawkweed** (*H. pilosella*) is a low-growing hawkweed from 3 to 10 inches tall, commonly found in colonies of rosettes connected by stolons forming a circular pattern. All leaves either form a basal rosette, or grow as single leaves along the stolons. Each rosette produces only one yellow flower head on a single slender, hairy stem. Blooms in May and June.
 - **Orange hawkweed** (*H. aurantiacum*) is usually 12 inches tall, with deep red-orange, notch-tipped ray flowers. Flowers begin to open in May or June and plants send out four to eight stolons each season. Has been reported to be allelopathic (inhibits other plants by producing toxic chemicals in the surrounding soil).
 - **Polar Hawkweed** (*H. atratum*) has 2-10 yellow flowers in branched flower clusters, coarsely toothed leaves, a few leaves along the stem and no stolons. Basal leaves egg-shaped, tapering abruptly to the petiole (leaf stalk)). Usually just one basal leaf remaining at time of flowering. From 6 to 36 inches tall depending on habitat. Blooms mid to late summer.
 - **Queen-devil Hawkweed** (*H. glomeratum*), leaves bright green to yellow-green, similar in appearance to the more common yellow hawkweed (also called meadow

- hawkweed, *H. caespitosum*). Small yellow flowers cluster tightly on the top of leafless, hairy stems that are up to 3 feet tall. 15-25 flower heads in round-topped clusters. Leaves at base have short, stiff hairs on both sides, giving plant a rough texture. Stolons are absent.
- **Smooth Hawkweed** (*H. laevigatum*), larger yellow flowerheads without hairs, 10-25 heads in branched flower clusters, coarsely toothed leaves, 7-10 leaves on stems and no stolons. Basal leaves present and well-developed at flowering time, bright green, broadly elliptical and tapering abruptly to the petiole (leaf stalk). Stems hairy, from 1.5 to almost 4 feet tall.
 - **Yellow hawkweed** (*H. caespitosum*), also called meadow hawkweed. Leaves bright green to yellow-green, hairy on both sides. Yellow hawkweed has clusters of 20-50 flowerheads in compact, flat-topped clusters near the tops of nearly leafless, hairy stems, grows to 2 feet tall or so, and has stolons. Flower styles are dark.
 - **Common hawkweed** (*H. lachenalii*) is similar to smooth hawkweed, with coarsely toothed leaves, no stolons, leafy stems, and open flower clusters. Common hawkweed is different in that flower heads have abundant hairs and are fewer (4-12) and plants are generally shorter, usually up to 16 inches tall. Basal leaves present and well-developed at flowering time, but usually more gray-green than smooth hawkweed. Also basal leaves taper gradually to the petiole (leaf stalk). Stem leaves similar to smooth hawkweed but usually only about 4 to 7 on stem.
 - **Tall hawkweed** (*H. piloselloides*) is a tall species, up to 3 feet tall or so with a mostly leafless stem, lacks stolons, and has dark green glaucous leaves that are glabrous (not hairy) on both sides except for a few long hairs especially along the leaf margins (edges) and lower midrib. Leaves are not obviously toothed and are narrow. Yellow flower heads in an open, round-topped cluster. Flower styles are yellow.

Habitat

- Hawkweeds prefer full sun or partial shade and soil that is well-drained, coarse-textured and moderately low in organic matter.
- Mostly found on roadsides and in fields, pastures and mountain meadows.
- Hawkweeds tolerate some shade and can grow in forest openings and cleared areas.
- Orange hawkweed is commonly found in or near residential yards and garden areas where it escapes from intentional plantings or as part of a “wildflower meadow mix”.
- Hawkweeds can be found from sea level to high elevations and are most abundant at middle elevations in the mountains and along roadsides.

Reproduction and Spread

- Hawkweeds are perennials that reproduce by seed. Many also spread out vegetatively through stolons, rhizomes and axillary buds from root crowns. Also, hawkweeds can produce viable seed without pollination.
- **For most hawkweed species, flowering typically starts in late May or early June.** Usually some plants go to seed starting in July but plants continue to flower and go to seed through September. Some hawkweed species flower later in the summer and hawkweeds also flower later at higher elevations.

- If stems are mowed, they will send up a shorter stem and flower again soon after being cut.

Local Distribution

There are hawkweed infestations scattered throughout King County. Infestations in King County occur on roadsides, residential properties, fields and meadows, and un-maintained properties. There are large infestations of hawkweed at the Tolt Reservoir east of Carnation, at Snoqualmie Pass around Alpentel and the Snoqualmie Ski area, and widely scattered throughout the Cedar River Watershed. There are roadside hawkweed sites on I-90, U.S. Highway 2, and State Highways SR-410, SR-18, SR169, SR-202 and SR-203. In unincorporated King County, there are hawkweed infestations on properties east of Redmond, east of Woodinville, near Covington and Kent, in the Edgewick area and throughout the towns of Skykomish and Baring. There are also hawkweed infestations in many cities in the county including Seattle, Burien, Renton, Woodinville, Bellevue, Black Diamond, Maple Valley, Redmond, North Bend, Enumclaw and Federal Way

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 which 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**).
- Control practices in critical areas should be selected to minimize soil disturbance or efforts should be taken to mitigate or reduce impacts of disturbance. Any disturbed areas need to be stabilized to control erosion and sediment deposition. Refer to the King County Surface Design Manual for further information about sediment and erosion control practices (call 206-296-6519 or go to <http://kingcounty.gov/wlr/Dss/Manual.htm> for more information).
- Generally work first in least infested areas, moving towards more heavily infested areas.
- Whenever possible, control should be done before plants are flowering to prevent seed production.
- Properly dispose of all parts of the plant (see Disposal Methods section below).
- Minimize disturbance to avoid creating more opportunities for seed germination.

- 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 greatly improve control of hawkweed.
- Large, established infestations will likely take multiple years to control, and eradication may not be feasible, especially in remote areas.

Early Detection and Prevention

- Difficult to spot in tall grass unless it is in flower. Survey pasture areas, unmanaged grasslands and roadsides for flowering and pre-flowering plants from **mid May to late June** for most hawkweed species (see Description section for bloom times).
- Isolated small populations can be dug up, but the site should be monitored for several years for plants growing from root fragments and from the seed bank.
- Prevent plants from spreading from existing populations by cleaning vehicles, boots and animals that have been in infested areas. Seeds are small and are easily carried in mud.
- To prevent new infestations: monitor for hawkweed, avoid over-grazing, and maintain proper turf or ornamental management (irrigation, fertilization, mowing) or increase shade by planting shrubs and trees.

Manual Control

- Hawkweeds with stolons will re-sprout from any fragments left in the soil so carefully remove all roots.
- Dig up plants in the spring or early summer when the soil is still moist and before the seeds mature. The roots are fibrous and relatively easy to dig up but break easily. It is important to remove as much root as possible.
- If the plants are in flower, cut off and bag all flower heads because they can form viable seeds after they are cut or dug up. If there are already seeds, bag and cut off the seed heads before digging up the rest of the plant. It is very difficult to pull the plants without dispersing the small, lightweight seeds. Brush off boots and clothes before leaving the infested area.
- Areas where mature plants are dug up may become infested with new seedlings unless they are carefully monitored and planted with grass or other competitive vegetation. Infested areas typically have many seedlings and an extensive seed bank.

Mechanical Control

- Mowing will not control hawkweeds because they are perennials and most reproduce by stolons as well as seed.
- Mowed plants respond by sending up shorter stems and quickly flowering again. Plants will also put more energy into spreading by stolons and the infestation size and density will increase.
- A single plowing may increase hawkweed cover, but on productive agricultural sites, an intensive management program that combines cultivation and annual crops will effectively control hawkweed.

Chemical Control

- For control of large infestations on non-pasture areas and roadsides, herbicide use may be necessary.
- **Precautions:**
 - Herbicides should only be applied at the rates and for the site conditions and/or land usage specified on the label of the product being used. **Follow all label directions.**
 - For herbicide use in critical areas and their buffers, certain restrictions apply depending on the site and jurisdiction. In unincorporated King County, refer to the **King County Noxious Weed Regulatory Guidelines** for a summary of current restrictions and regulatory compliance issues. Elsewhere, check with the local jurisdiction.
 - For your personal safety, at a minimum wear gloves, long sleeves, long pants, closed toe shoes, and appropriate eye protection. Follow label directions for any additional personal protection equipment needed.
- Treatment with herbicides is most effective in the spring and early summer. Applications that are later than the ideal time will be less effective, but the staggered flowering period means that herbicide applications can be partly effective throughout the flowering season.
- For dense infestations, because there are generally many stolons and seedlings between the larger plants, it is more effective to uniformly spray the infested area as opposed to directing spray to individual plants.
- Use of a selective broadleaf herbicide will make sure that any grass in the area survives to help suppress germination of hawkweed seeds remaining in the soil.
- Flowering plants may go to seed immediately when sprayed. To avoid this, spray plants before flowers open completely.
- Infested areas should not be mowed until after the herbicide has had a chance to work and the vegetation is brown and has died back.
- For several years following treatment, monitor areas for new plants germinating from the seed bank.

Specific Herbicide Information

- **Triclopyr** (e.g. Brush-B-Gon, Garlon 3A, Turflon II): Very effective on most hawkweed species. Apply to actively growing plants, ideally from spring to early summer before plants are fully in flower. Adding a surfactant is strongly recommended.
- **Aminopyralid** (e.g. Milestone): Very effective on all hawkweed species. Use the product appropriate for the site, right-of-way, non-crop or pasture. Not available for residential or commercial turf applications. For more information, contact this office or consult the label.
- **Clopyralid** (e.g. Transline): Apply to actively growing plants before the buds form (usually before mid-May, later at higher elevations). NOTE: This product may not be used in residential or commercial areas to control hawkweed in lawns and turf. For more information, contact this office or consult the label.

- **Dicamba** (e.g. Banvel, Weedmaster, some forms of Weed-B-Gon): Apply to actively growing plants before the flowers open (usually before June). Dicamba may require repeat treatments even under ideal conditions.
- **2,4-D** (e.g. Weed-B-Gon, Weedone): 2,4-D alone does not provide good hawkweed control. Combinations of 2,4-D with other selective herbicides such as dicamba or triclopyr are effective (e.g. Weedmaster or Crossbow). Apply to actively growing plants before buds form (usually before mid May, later at higher elevations).
- **Glyphosate** (e.g. Roundup): Currently, there is no information on the effectiveness or timing of glyphosate treatment for hawkweed control. Glyphosate is not generally recommended because it will kill grass as well as the hawkweed and a healthy grass population can be very beneficial in reducing re-infestation from the seed bank. Treatment with glyphosate needs to be followed by re-seeding with grass. Without re-seeding, bare areas will be re-infested from the seed bank and by any missed plants.

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 Control

- There are no biological controls currently available for hawkweeds.

SUMMARY OF BEST MANAGEMENT PRACTICES

Small Infestations in Native and/or Desirable Vegetation

- Dig up plants by hand including all roots and stolons. This is easier to accomplish when the soil is wet.
- Replace any divots created when removing the plants to lessen the amount of disturbed soil.
- Apply appropriate herbicide with wick wiper or by spot spray to minimize off target injury.
- Monitor site throughout growing season and remove any new plants.
- If using an herbicide in a grassy area, use a selective broadleaf herbicide to avoid injury to the grass.

Large Infestations in Grassy Areas

- Mowing is not effective for controlling hawkweed. See Mechanical Control section.
- Large infestations can be controlled with selective broadleaf herbicides. (See the Chemical Control section above).
- Suppression of large infestations of hawkweed with a selective broadleaf herbicide will greatly increase grass production, which in turn increases the suppression of the hawkweed.

- Apply the selective herbicide in early spring. In May or June, the infested area should then be monitored for any flowering plants that were missed by the herbicide.
- All remaining flower heads should be bagged and removed before seeds mature, usually by July. Surviving plants can be re-sprayed.
- Promote healthy grass by seeding and fertilizing. Use a mix of grass and clover species to improve resistance to hawkweed. Fertilize according to the soil needs.
- If area is grazed it should be managed to promote grass and clover vigor. Graze uniformly and move animals from area to area in a planned sequence. Avoid grazing when soil is wet because this can create holes and allow weed infestation. Some winter grazing by smaller animals can stimulate growth of clover and improve grass health.
- Be sure to monitor for hawkweed on edges of pastures and disturbed areas around fences and watering holes. Remove isolated plants before they flower.
- If needed, apply a nitrogen fertilizer after the selective broadleaf herbicide application and then manage grazing so that 4 to 6 inches of grass re-growth remains at the end of the growing season so grasses can effectively resist re-invasion by hawkweed.
- For several years following treatment, monitor areas for new plants from the seed bank.
- If a non-selective herbicide (such as glyphosate) is used, it must be combined with effective re-vegetation of the site. If the site is not re-vegetated, hawkweed seedlings from the existing seed bank will quickly re-infest the area.

Control in Riparian Areas

- Additional permits may be required for control of infestations in riparian areas. See the Noxious Weed Regulatory Guidelines for information or contact the local jurisdiction.
- In some cases, the cleared area will need to be replanted with native or non-invasive vegetation and stabilized against erosion. See the King County Surface Water Design Manual for further information about sediment and erosion control practices (<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/surface-water-design-manual> or call 206-296-6519).
- Focus on manual removal for small infestations if possible.
- For larger areas where herbicide use is warranted, spray using low pressure and large droplet size or apply with a wick wiper to prevent drift. If there is a likelihood that herbicide could enter a water body or wetland, obtain necessary permits and make sure only licensed aquatic applicators apply approved aquatic herbicides and surfactants.

Control along Road Rights-of-Way

- Dig up small infestations if possible.
- Spray infested areas with a systemic herbicide (see Chemical Section above for recommendations), taking care not to spray beneficial vegetation.
- In grassy areas, use a selective broadleaf herbicide such as triclopyr or aminopyralid; if controlled with a non-selective herbicide, such as glyphosate, re-seed with an appropriate grass or native seed mix after control is completed.
- If using herbicide on plants that are about to flower, the flower heads need to be removed and bagged before applying herbicide.

Disposal Methods

- Bag all flower heads. If the plants are in seed, carefully cut off the seed head and place in a bag without dispersing the seeds.
- Dispose of flower heads and plants in household garbage or take to a transfer station for disposal. Do not compost or put in yard waste.

References

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