

Oregon Department of Agriculture
Plant Pest Risk Assessment for
Mouseear Hawkweed, *Hieracium pilosella* L.
2011

Name: Mouseear hawkweed, *Hieracium pilosella*
Family: Aster, *Asteraceae*

Findings of this Review and Assessment: Mouseear hawkweed, *Hieracium pilosella*, was evaluated and determined to be a category “**A**” rated noxious weed, as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination was based on a literature review and analysis using two ODA evaluation forms. Using the Noxious Qualitative Weed Risk Assessment v. 3.8, mouseear hawkweed scored **53** indicating a Risk Category of **B**; and a score of **15** with the Noxious Weed Rating System v. 3.2, indicating an “**A**” rating. Though mouseear hawkweed scored in the B range, its limited distribution warrants an **A** listing.

Introduction: Mouseear hawkweed is a member of the sunflower family and very similar in growth form to the common dandelion. It is an aggressive weed of grasslands, right of way, pastures, lawns and wastelands. Similar to the other hawkweeds, mouseear hawkweed plants thrive in a wide variety of soil conditions but prefer semi-arid, sunny soils, sandy soils and less fertile sites. Early herbarium specimens were collected from cemeteries, lawns and wastes areas therefor it is assumed to have arrived from Europe in packing material and not as a seed contaminant. There are reported medicinal properties associated mouseear hawkweed including old, modern and specific remedies for internal and external use. Currently the literature is conflicted as to the plant’s allelopathic properties. The dense mats do create a ‘halo’ around them but this effect is a resulting change of moisture, pH and carbon increases in the soil the plants and not from a chemical extruded by the plants themselves (McIntosh, P. et al., 1995), (Dobson and Scot 1985). Some Internet sites still offer the plant for sale, though sale and delivery to Oregon is prohibited. It is currently listed as a noxious weed in three states though occurring in twenty-four states mostly in the eastern US. Mouseear hawkweed is not a USDA federally listed noxious weed.



Mouseear hawkweed flowers, photo by Tom Forney, ODA

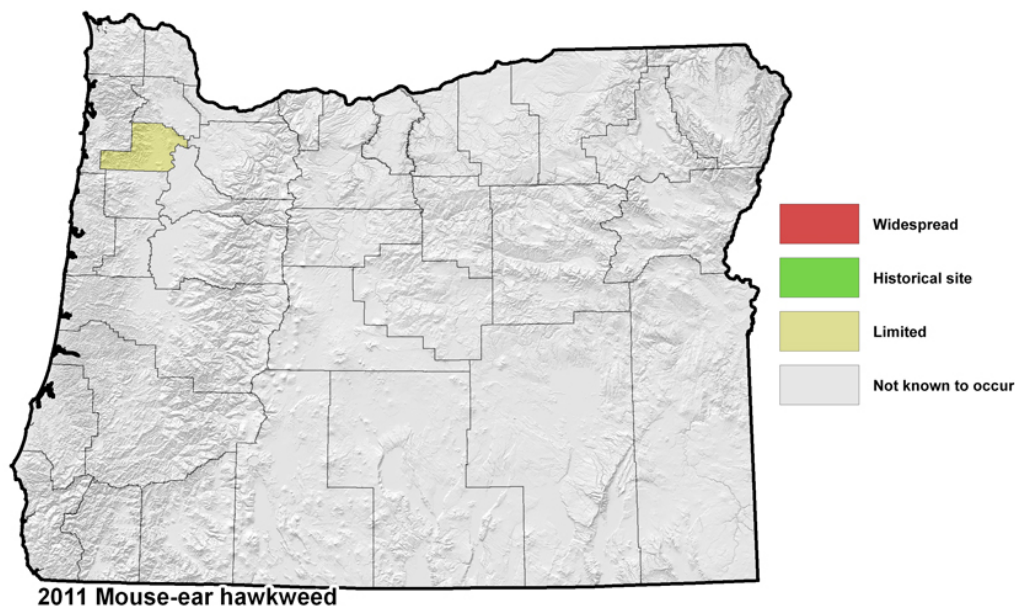
Growth Habits and Reproduction: Mouseear hawkweed is an herbaceous perennial plant that flowers in late spring to early summer (May- June). Hawkweeds are capable of completing their life cycles very quickly. Seedlings emerging in the early spring can produce flowers by June and viable seeds by mid-summer.

It produces a single yellow flower head on each bristly hairy stem. It is the only invasive hawkweed that sports a solitary flower head similar in growth to dandelions. Each flower head is about $\frac{3}{4}$ to one inch in diameter and produces 50 to 100 individual florets. The smaller flowers (florets) often have a red-purple stripe on the underside or outer face. Stems are unbranched, leafless and grow from three to ten inches tall containing a milky fluid. The spatula shaped leaves are basal only, growing in rosettes or individually along the stolons and have bristly hairs on both sides. The upper leaf surfaces are green while the lower leaf surface is whitish-green with dense tiny star-shaped hairs. Each seed is ribbed and turfed with a plume of hairs allowing them to attach to a variety of objects or carried in the wind. Seeds are produced both sexually by pollination and asexually without pollination and can remain viable in the soil for up to seven years. Plants have a fibrous root system and produce stolons once flowering stems begin growing. Stolons create daughter plants thereby vegetatively expanding established plant populations outward forming a dense mat.

Growth Habits, Reproductive and Spread: Mouseear hawkweed produces hundreds of windblown seeds per flower head. Stolon production also is significant to insure site dominance after establishment occurs. Mouseear hawkweed relies less on seed production and instead favors stoloniferous growth for reproduction (Makepeace 1985). With the abundance of disturbed ground and pastureland in Oregon, this and other hawkweeds have an unlimited supply of fresh habitat to invade. In Washington State, it is primarily a weed of west-side pastures but it is well adapted to moist east-side conditions also.

Wind is the primary dispersal agent for the seeds. Other dispersal factors include the movement of contaminated hay, livestock or wildlife movement. It has not been a contaminant in commercial seed mixes. Water may also be a dispersal mechanism when populations are found growing adjacent to streams.

Mouseear hawkweed appearance is similar to many other dandelion-like asters and may escape notice for many years. Growing less than 12" tall, it does not present a highly showy target. More populations may be present in Oregon and have gone undetected.



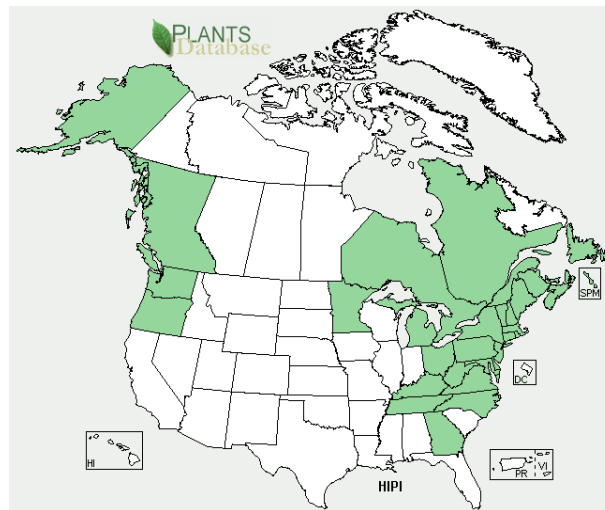
Oregon's distribution of mouseear hawkweed on WeedMapper

Biological Factors Effecting Growth and Establishment: The species is attacked by a variety of insects and diseases in its native land. None of these species are present in the PNW so the plants are able to grow to their full biological potential. Grazing animals feed on mouseear hawkweed though their impact is insufficient to retard plant growth and spread. Grazing may actually stimulate the production of stolons thereby strengthening the plants ability to spread vegetatively.

Native Range: Mouseear hawkweed is native to England, Europe and Asia.

World Distribution: Populations have been recorded in North America since 1861, New Zealand in 1904, and South American in Argentina since 1996. Australia reported a location in Tasmania in 2001 but that population has been eliminated. The eastern Canadian provinces in addition to British Columbia have documented populations.

Distribution in North America: Mouseear hawkweed was first reported in North America in Michigan in 1861. Currently all of eastern Canada provinces south to Georgia are reporting infestations. The middle section of the U.S., Canada and southwest are currently not infested but the Pacific Northwest including Oregon (one site), Washington, British Columbia and Alaska all have record sites.



US distribution of mouseear hawkweed on Plants Database

Positive Economic Impact: There are minimal economic benefits from mouseear hawkweed. Plants are being sold through the Internet and information can be obtained for making herbal remedies for both external and internal uses. It cannot be sold in Oregon

Negative Economic Impact: Mouseear hawkweed is invasive in pastures and residential areas promoting the need for expensive control programs. Infested areas lose forage and may require fertilizer and herbicides application to reduce this impact. Monocultures can degrade pastures and natural areas reducing forage available for wildlife and domestic livestock. New Zealand hillside pastures located on the South Island have been significantly invaded which has reduced the carrying capacity of those pastures

Ecological Impacts: Mouseear hawkweed does invade a wide variety of habitats. It can create dense mats of rosettes replacing both desirable and native vegetation. In extreme cases natural areas could be severely impacted reducing biodiversity and all the associated ramifications.

Control: Mouseear hawkweed can be suppressed in pastures through the use of fertilizer to stimulate grass competition and/or the addition of herbicides (Scott 1993). Mowing and other mechanical control measures are ineffective. New Zealand data indicates that herbicides are not as effective on mouseear hawkweed as they are on other hawkweeds though newer chemistry such as aminopyralid, may offer better control than older compounds. Complicating matters, seeds remain viable in the soil up to seven years requiring site monitoring and follow-up treatments well after the initial population is removed. Biocontrol is not currently an option in the Pacific Northwest. The presence of fourteen native hawkweeds (Wilson L, 2006) will complicate the task of obtaining biocontrol agents for the hawkweeds complex and the potential hybridization between non-native hawkweeds may complicate finding safe and effective agents. Five biocontrol agents have been released in New Zealand though results are not yet determined.

Noxious Weed Qualitative Risk Assessment

Oregon Department of Agriculture

Common name: Mouseear hawkweed
Scientific name: *Hieracium pilosella*
Family: Aster, *Asteraceae*

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

Total Score: 53 **Risk Category: B**

GEOGRAPHICAL INFORMATION

1) 5 **Invasive in Other Areas**

- 0 Low- not known to be invasive elsewhere.
- 2 Known to be invasive in climates dissimilar to Oregon's current climates.
- 6 Known to be invasive in geographically similar areas.

Comments: Known to be invasive in geographically similar areas.

2) 6 **Habitat Availability:** Are there susceptible habitats for this species and how common or widespread are they in Oregon?

- 1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
- 3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
- 6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).

Comments: Habitat large but restricted to higher rainfall regions.

3) 0 **Proximity to Oregon:** What is the current distribution of the species?

- 0 *Present* – Occurs within Oregon.
- 1 *Distant* – Occurs only in distant US regions or foreign countries.
- 3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
- 6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.

Comments: Occurs in Oregon.

4) 10 **Current Distribution:** What is the current distribution of escaped populations in Oregon?

- 0 *Not present* – Not known to occur in Oregon.
- 1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).
- 5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
- 10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

Comments: Limited to one infestation.

BIOLOGICAL INFORMATION

- 5) 3 **Environmental Factors:** Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).
- 1 *Low* – Severely confined by abiotic factors.
 - 2 *Medium* – Moderately confined by environmental factors
 - 4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

Comments: Adapted to higher precipitation conditions.

- 6) 6 **Reproductive Traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.
- 0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
 - 1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
 - 3 *Medium* – Reproduction is vegetative (e.g., by root fragments, rhizomes, bulbs, stolons).
 - 3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
 - 5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
 - 6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

Comments: Has two or more reproductive traits.

- 7) 4 **Biological Factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)
- 0 *Negligible* – Host plant not present for parasitic species.
 - 1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
 - 2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.
 - 4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

Comments: Few biotic interactions restrict growth and reproduction.

- 8) 3 **Reproductive Potential and Spread After Establishment - Non-human Factors:** How well can the species spread by natural means?
- 0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).
 - 1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).
 - 3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed).
 - 5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed).

Comments: Moderate potential for natural spread by animal movement.

- 9) 3 **Potential of Species to be Spread by Humans.** What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.
- 1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).
 - 3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).
 - 5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

Comments: Potential for introduction or off-site movement moderate.

IMPACT INFORMATION

- 10) 2 **Economic Impact:** What impact does/can the species have on Oregon's agriculture and economy?
- 0 *Negligible* – Causes few, if any, economic impacts.
 - 1 *Low* - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).
 - 5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).
 - 10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

Comments: Potential to or causes low economic impact to agriculture.

- 11) 1 **Environmental Impact:** What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.
- 0 *Negligible* – None of the above impacts probable.
 - 1 *Low* – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.
 - 4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).
 - 6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

Comments: Causes few or minor environmental impacts.

- 12) 0** **Impact on Health:** What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms).
- 0 *Negligible* – Has no impact on human or animal health.
 - 2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge).
 - 4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).
 - 6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock).

Comments: Has no impact on human or animal health.

CONTROL INFORMATION

- 13) 8** **Probability of Detection at Point of Introduction:** How likely is detection of species after introduction and naturalization in Oregon?
- 1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).
 - 5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).
 - 10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

Comments: Probability of initial detection is low.

- 14) 2** **Control Efficacy:** What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?
- 1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).
 - 2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).
 - 4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.
 - 6 *High* – No effective treatments known or control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable. Political or legal issues may prevent effective control.

Comments: Tillage or herbicides provide good control.

Category Scores:

21 Geographic score (Add scores 1-4)

19 Biological Score (Add lines 5-9)

03 Impact Score (Add lines 10-12)

10 Control Score (Add Lines 13-14)

53 Total Score (Add scores 1-14 and list on front of form)

Risk Category: 55-89+ = **A** 24-54 = **B** < 24 = unlisted.

This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species.

1/15/2013 v.3.8

Oregon Department of Agriculture
Noxious Weed Rating System

Common Name: Mouseear hawkweed
Scientific Name: *Hieraceum pilosella*

Points: 15 **Rating: A**

- 1) 2 **Detrimental Effects:** Circle all that apply, enter number of circles.
1. *Health:* causes poisoning or injury to humans or animals
2. *Competition:* strongly competitive with crops, forage, or native flora
3. *Host:* host of pathogens and/or pests of crops or forage
4. *Contamination:* causes economic loss as a contaminate in seeds and/or feeds
5. *Interference:* interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement
- 2) 3 **Reproduction & Capacity for Spread:** Circle the number that best describes, enter that number.
1. Few seeds, not wind blown, spreads slowly
2. Many seeds, slow spread
3. Many seeds, spreads quickly by vehicles or animals
4. Windblown seed, or spreading rhizomes, or water borne
5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials
- 3) 2 **Difficulty to Control:** Circle the number that best describes, enter that number.
1. Easily controlled with tillage or by competitive plants
2. Requires moderate control, tillage, competition or herbicides
3. Herbicides generally required, or intensive management practices
4. Intensive management generally gives marginal control
5. No management works well, spreading out of control
- 4) 6 **Distribution:** Circle the number that best describes, enter that number.
1. Widely distributed throughout the state in susceptible habitat
2. Regionally abundant, 5 or more counties, more than 1/2 of a county
3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
4. Contained in only 1 watershed, or less than 5 square miles gross infestation
5. Isolated infestation less than 640 acres, more than 10 acres
6. Occurs in less than 10 acres, or not present, but imminent from adjacent state
- 5) 2 **Ecological Impact:** Circle the number that best describes, enter that number.
1. Occurs in most disturbed habitats with little competition
2. Occurs in disturbed habitats with competition
3. Invades undisturbed habitats and crowds out native species
4. Invades restricted habitats (i.e. riparian) and crowds out native species

15 TOTAL POINTS

Note: Noxious weeds are non-native plants with scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as "A" rated weeds. *Ratings:* 16+ = A, 15 – 11 = B
ODA Weed Rating System 8/30/2012 v.3.2

RA produced by Dave Langland, ODA. Edited by Glenn Miller, Tom Forney March 2011

References:

Herbs2000.com, Mouseear, *Hieracium pilosella*
http://www.herbs2000.com/herbs/herbs_mouse_ear.htm

McIntosh, P. et al. .1995. Soil Changes under Mouse-ear Hawkweed (*hieracium pilosella*)
New Zealand Journal of Ecology 19(1) pp. 29-34

Roche, C.1992. PNW 409 Mouseear Hawkweed Pacific Northwest Extension Publication PNW 409

Plants Profile for *Hieracium pilosella* (Mouseear Hawkweed) from USDA PLANTS database.
Available at plants.usdagov/java/profile?symbol=HIPI

Wilson, L. 2006. Key to Identification of Invasive and Native Hawkweeds (*Hieracium* spp.) in the Pacific Northwest, British Columbia Ministry of Forestry and Range, Forest Practices Br. B.C.

Scot D. 1993. Response of Hieracium in two long-term manipulative agricultural trials. New Zealand Journal of Ecology 17(1) pp. 41-46

Dobson A.T., Makepeace W., Scot D. 1985 Interference phenomena due to mouseear and king-devil hawkweed. New Zealand Journal of Botany 23(1) pp. 79-90

Makepeace W. 1985. Growth, reproduction, and production biology of mouseear and kingdevil hawkweed in eastern South Island, New Zealand. New Zealand Journal of Botany 23(1) pp. 65-78

Attachment A

