

PLANT INVASIVENESS ASSESSMENT FORM

Botanical name: *Hieracium aurantiacum* L. and *H. caespitosum* Dumort.

Common name: orange and meadow hawkweed

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Outcome score:

A. Climatic Comparison		
This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes
2	Interior-Boreal	Yes
3	Arctic-Alpine	Yes
This species is unlikely to establish in any region in Alaska		

B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	29
2	Biological characteristic and dispersal ability	25 (25)	23
3	Ecological amplitude and distribution	25 (25)	19
4	Feasibility of control	10 (10)	8
	Outcome score	100 (100) ^b	79 ^a
	Relative maximum score†		0.79

* For questions answered “unknown” do not include point value for the question in parentheses for “Total Answered Points Possible.”

† Calculated as ^a/_b.

A. CLIMATIC COMPARISON:

1.1 Has this species ever been collected or documented in Alaska?

Yes Yes – continue to 1.2
 No – continue to 2.1

1.2. Which eco-geographic region has it been collected or documented (see inset map)?

Proceed to Section B. Invasiveness Ranking.

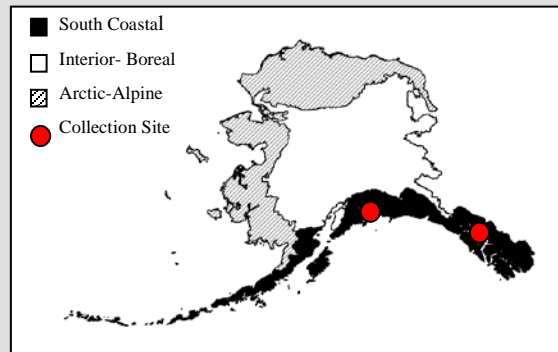
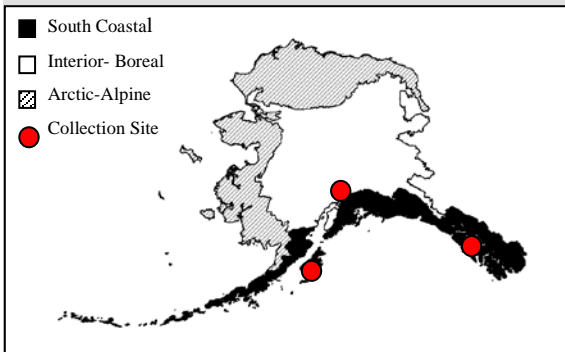
Yes South Coastal

Yes Interior-Boreal

Arctic-Alpine

Documentation: *Hieracium aurantiacum* has been collected in South Coastal (Juneau – Hultén 1968, Kodiak – Spencer - pers. com.) and Interior-Boreal (Willow – Lapina 2003) ecoregions in Alaska.

Documentation: *Hieracium caespitosum* has been collected in Juneau and Valdez (AK Weeds Database 2005, M. Shephard – pers. com.).



Sources of information:

AK Weeds Database. 2004. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database. Available: <http://akweeds.uaa.alaska.edu/>

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710) – Pers. obs.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503. Tel: (907) 743-9454 - Pers. com.

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2.1. Is there a 40% or higher similarity (based on CLIMEX climate matching) between climates any where the species currently occurs and

- a. Juneau (South Coastal Region)?
 - Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking
 - No
- b. Fairbanks (Interior-Boreal)?
 - Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking
 - No
- c. Nome (Arctic-Alpine)?
 - Yes – record locations and similarity; proceed to Section B.
Invasiveness Ranking
 - No
– If “No” is answered for all regions, reject species from consideration

Documentation: Using CLIMEX matching program, climatic similarity between Nome and areas where *Hieracium aurantiacum* is documented is moderately high. Range of the species includes Anchorage (Alaska), Vaasa (Finland), and Saint-Petersburg (Russia) (Hultén 1968), which has a 61%, 54%, and 53% climatic match with Nome, respectively. These suggest that establishment of orange hawkweed in Arctic-Alpine eco-geographic region may be possible.

Range of *Hieracium caespitosum* includes Kirov and Kazan, Russia (Gubanov et al. 1995), which has a 66%, and 58% climatic match with Nome, and 60% and 59% climatic match with Fairbanks respectively. Thus establishment of meadow hawkweed in Interior-Boreal and Arctic-Alpine ecogeographic regions may be possible.

Sources of information:

CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.

Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Center European Russia. Moscow. Argus. 558 pp.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes

- A. No perceivable impact on ecosystem processes 0
- B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) 3
- C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl) 7
- D. Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology; hydrology; or affects fire frequency, altering community composition; species fixes substantial levels of nitrogen in the soil making soil unlikely to support certain native plants or more likely to favor non-native species) 10
- U. Unknown

Score

7

Documentation:

Identify ecosystem processes impacted:

Orange and meadow hawkweed likely reduce soil moisture and nutrient availability (J. Snyder – pers.com.).

Rational:

Sources of information:

Snyder J.M., UAF Cooperative Extension Service 2221 E. Northern Lights Blvd. #118 Anchorage, AK 99508-4143 tel: (907) 786-6310 alt.tel: (907) 743-9448 – Pers.com.

1.2. Impact on Natural Community Structure

- A. No perceived impact; establishes in an existing layer without influencing its structure 0
- B. Influences structure in one layer (e.g., changes the density of one layer) 3
- C. Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) 7
- D. Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) 10
- U. Unknown

Score

7

Documentation:

Identify type of impact or alteration:

Extensive stolons form dense mats of hawkweed plants creating a new layer, and excluding other forbs and grasses (Callihan and Miller 1999, Prather et al. 2003, Rinella and Sheley 2002).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho. <http://www.oneplan.org/>.

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT. <http://www.montana.edu/wwwpb/pubs/>.

1.3. Impact on Natural Community Composition

- A. No perceived impact; causes no apparent change in native populations 0
- B. Influences community composition (e.g., reduces the number of individuals in one or more native species in the community) 3
- C. Significantly alters community composition (e.g., produces a significant reduction in

- the population size of one or more native species in the community)
- D. Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or change the community composition towards species exotic to the natural community) 10
- U. Unknown

Score

8

Documentation:

Identify type of impact or alteration:

Orange and meadow hawkweed eliminate other vegetation by forming dense, monospecific stands (Callihan and Miller 1999, Prather et al. 2003, Rinella and Sheley 2002). Effects of this taxon are likely restricted to low herbaceous species (M. Carlson). Orange hawkweed reduces the population of native species in forbs-fern meadows in Kodiak (P. Spencer – pers. comm.).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho. <http://www.oneplan.org/>

Carlson M.L., Ph.D., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT. <http://www.montana.edu/wwwpb/pubs/>

Spencer, P. Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448 Pers. Pers. com.

1.4. Impact on higher trophic levels (cumulative impact of this species on the animals, fungi, microbes, and other organisms in the community it invades)

- A. Negligible perceived impact 0
- B. Minor alteration 3
- C. Moderate alteration (minor reduction in nesting/foraging sites, reduction in habitat connectivity, interference with native pollinators, injurious components such as spines, toxins) 7
- D. Severe alteration of higher trophic populations (extirpation or endangerment of an existing native species/population, or significant reduction in nesting or foraging sites) 10
- U. Unknown

Score

7

Documentation:

Identify type of impact or alteration:

Orange and meadow hawkweed are unpalatable and reduces the forage value of grasslands for grazing animals. It hybridizes freely with native and non-native hawkweeds (Callihan and Miller 1999, Noxious Weed Control Program 2004, Prather et al. 2003, Rinella and Sheley 2002). Orange hawkweed is also a host for nematode species (Townshend and Davidson 1962).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho. <http://www.oneplan.org/>.

Townshend, J.L. and T.R. Davidson. 1962. Some weed hosts of the northern root-knot nematode, *Meloidogyne hapla* Chitwood, 1949, in Ontario. Canadian Journal of Botany 40: 543-548.

Noxious Weed Control Program. 2004. King County Noxious Weed List. Best management practices Hawkweeds – Hieracium spp. Asteraceae. Department of

Natural Resources and Parks. Water and Land Resources Division. Washington. Available: <http://dnr.metrokc.gov/wlr/LANDS/weeds/hogweed.htm> [January 28, 2005].

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT. <http://www.montana.edu/wwwpb/pubs/>.

Total Possible	40
Total	29

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode of reproduction

- A. Not aggressive reproduction (few [0-10] seeds per plant and no vegetative reproduction) 0
- B. Somewhat aggressive (reproduces only by seeds (11-1,000/m²) 1
- C. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m²) 2
- D. Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m²) 3
- U. Unknown

Score

3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Each rosette of hawkweed is capable of producing between 600 and 45,000 tiny black seeds. In addition to reproducing by seeds, hawkweeds are capable of spreading by rhizomes, stolons and adventitious root buds (Callihan and Miller 1999, Prather et al. 2003, Rinella and Sheley 2002).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho. <http://www.oneplan.org/>

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT. <http://www.montana.edu/wwwpb/pubs/>

2.2. Innate potential for long-distance dispersal (bird dispersal, sticks to animal hair, buoyant fruits, wind-dispersal)

- A. Does not occur (no long-distance dispersal mechanisms) 0
- B. Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations) 2
- C. Numerous opportunities for long-distance dispersal (species has adaptations such as pappus, hooked fruit-coats, etc.) 3
- U. Unknown

Score

3

Documentation:

Identify dispersal mechanisms:

Seeds are spread by wind and animals (Callihan and Miller 1999, Rinella and Sheley 2002).

Rational:

Seeds are tiny and plumed.

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho.

<http://www.oneplan.org/>.

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sales, use as forage/revegetation, spread along highways, transport on boats, contamination, etc.)

- A. Does not occur 0
- B. Low (human dispersal is infrequent or inefficient) 1
- C. Moderate (human dispersal occurs) 2
- D. High (there are numerous opportunities for dispersal to new areas) 3
- U. Unknown

Score

3

Documentation:

Identify dispersal mechanisms:

Seeds are easily carried by vehicles, animals and clothing. Orange hawkweed has escaped from flower gardens (Noxious Weed Control Program 2004, Rinella and Sheley 2002).

Rational:

Sources of information:

Noxious Weed Control Program. 2004. King County Noxious Weed List. Best management practices Hawkweeds – *Hieracium* spp. Asteraceae. Department of Natural Resources and Parks. Water and Land Resources Division. Washington. Available: <http://dnr.metrokc.gov/wlr/LANDS/weeds/hogweed.htm> [January 28, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>.

2.4. Allelopathic

- A. No 0
- B. Yes 2
- U. Unknown

Score

2

Documentation:

Describe effect on adjacent plants:

Described as allelopathic (Murphy and Aarssen 1995, Noxious Weed Control Program 2003).

Rational:

Sources of information:

Murphy, S.D. and L.W. Aarssen. 1995. In vitro allelopathic effects of pollen from three *Hieracium* species (Asteraceae) and pollen transfer to sympatric Fabaceae. *American Journal of Botany*. 82(1): 37-45.

Noxious Weed Control Program. 2003. King County Noxious Weed List. Orange Hawkweed *Hieracium aurantiacum*. Department of Natural Resources and Parks. Water and Land Resources Division. <http://dnr.metrokc.gov/weeds/> [Jan 14, 2003].

2.5. Competitive ability

- A. Poor competitor for limiting factors 0
- B. Moderately competitive for limiting factors 1
- C. Highly competitive for limiting factors and/or nitrogen fixing ability 3
- U. Unknown

Score

3

Documentation:

Evidence of competitive ability:

Orange and meadow hawkweed outcompete many native species by forming dense, monospecific stands (Prather et al. 2003, Rinella and Sheley 2002).

Rational:

Sources of information:

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W.

Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture.

Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>

2.6. Forms dense thickets, climbing or smothering growth habit, or otherwise taller than the surrounding vegetation

- A. No 0
- B. Forms dense thickets 1
- C. Has climbing or smothering growth habit, or otherwise taller than the surrounding vegetation 2
- U. Unknown

Score

Documentation:

Describe grow form:

Orange and meadow hawkweeds form dense, monospecific stands. However, leaves are primarily basal and do not shade grasses and most other forbs (Callihan and Miller 1999, Rinella and Sheley 2002).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho's Noxious Weeds. University of Idaho.

<http://www.oneplan.org/>.

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>.

2.7. Germination requirements

- A. Requires open soil and disturbance to germinate 0
- B. Can germinate in vegetated areas but in a narrow range or in special conditions 2
- C. Can germinate in existing vegetation in a wide range of conditions 3
- U. Unknown

Score

Documentation:

Describe germination requirements:

Can germinate in vegetated areas, but germination is best in full sun (Rinella and Sheley 2002).

Rational:

Sources of information:

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>

2.8. Other species in the genus invasive in Alaska or elsewhere

- A. No 0
- B. Yes 3
- U. Unknown

Score

Documentation:

Species:

Hieracium umbellatum L., *H. pilosella* L., *H. piloselloides* Vill, and *H. floribundum* Wimmer & Grab. are listed as noxious weeds in US (Invaders Database System 2002, Royer and Dickinson 1999, USDA, NRCS 2002).

Sources of information:

Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. <http://invader.dbs.umt.edu/>
Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

2.9. Aquatic, wetland, or riparian species

- A. Not invasive in wetland communities 0
- B. Invasive in riparian communities 1
- C. Invasive in wetland communities 3
- U. Unknown

Score

2

Documentation:

Describe type of habitat:

Orange and meadow hawkweeds generally inhabit roadsides, gravel pits and pastures, occurs in moist grasslands (Callihan and Miller 1999, Prather et al. 2003). In Alaska orange hawkweed has been observed invading wetland (M. Shephard – pers. obs.).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho’s Noxious Weeds. University of Idaho. <http://www.oneplan.org/>
Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho’s Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].
Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. com.

Total Possible

25

Total

23

3. DISTRIBUTION

3.1. Is the species highly domesticated or a weed of agriculture

- A. No 0
- B. Is occasionally an agricultural pest 2
- C. Has been grown deliberately, bred, or is known as a significant agricultural pest 4
- U. Unknown

Score

4

Documentation:

Identify reason for selection, or evidence of weedy history:

Orange hawkweed was first introduced into United States for use as an herbal remedy and garden ornamental. It is currently being planted as an ornamental in Girdwood and the Susitna Valley (I. Lapina pers. obs.).

Rational:

Sources of information:

Callihan, R.H. and T.W. Miller. 1999. Idaho’s Noxious Weeds. University of Idaho. <http://www.oneplan.org/>

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska
Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710) – Pers. obs.

- 3.2. Known level of impact in natural areas
- A. Not known to cause impact in any other natural area 0
 - B. Known to cause impacts in natural areas, but in dissimilar habitats and climate zones than exist in regions of Alaska 1
 - C. Known to cause low impact in natural areas in similar habitats and climate zones to those present in Alaska 3
 - D. Known to cause moderate impact in natural areas in similar habitat and climate zones 4
 - E. Known to cause high impact in natural areas in similar habitat and climate zones 6
 - U. Unknown

Score

4

Documentation:

Identify type of habitat and states or provinces where it occurs:

Orange and meadow hawkweed invade permanent meadows, grasslands, rangelands, and pastures in Montana and Washington. It is a major environmental weed in montane areas in Canada and New Zealand (Noxious Weed Control Board 2004, Prather 2003, Rinella and Sheley 2002). Orange hawkweed invades forbs-fern meadows in Kodiak (P. Spencer – pers. comm.).

Sources of information:

Noxious Weed Control Board. 2004. Washington State.

<http://www.nwcb.wa.gov/INDEX.htm>

Prather, T.S., S.S. Robins, D.W. Morishita, L.W. Lass, R.H. Callihan, and T.W. Miller. 2003. Idaho's Noxious Weeds. University of Idaho in cooperation with the Idaho Weed Coordinating Committee Idaho State Department of Agriculture. Available: <http://www.oneplan.org/> [January 14, 2005].

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>.

Spencer, P. Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448Pers. Pers. com.

- 3.3. Role of anthropogenic and natural disturbance in establishment
- A. Requires anthropogenic disturbances to establish 0
 - B. May occasionally establish in undisturbed areas but can readily establish in areas with natural disturbances 3
 - C. Can establish independent of any known natural or anthropogenic disturbances 5
 - U. Unknown

Score

3

Documentation:

Identify type of disturbance:

Hawkweeds readily grow in cleared areas in forests. Mowing promotes flowering and spreading of stolons. However, populations often establish in remote mountain meadows and forested habitats with moderate levels of natural disturbance. Orange and meadow hawkweeds have been established in native communities with natural disturbances in Kodiak, Juneau, and Valdez in Alaska (P. Spencer – pers. comm., M. Shephard – pers. com.).

Rational:

Sources of information:

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>.

Shephard, M. , Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503. Tel: (907) 743-9454 - Pers. com.

Spencer, P. Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448Pers.

3.4. Current global distribution

- A. Occurs in one or two continents or regions (e.g., Mediterranean region) 0
- B. Extends over three or more continents 3
- C. Extends over three or more continents, including successful introductions in arctic or subarctic regions 5
- U. Unknown

Score

3

Documentation:

Describe distribution:

Orange hawkweed originates from British Isles, South Scandinavia, west to Russia, and south to Mediterranean. Meadow hawkweed is indigenous to northern, central and eastern Europe. Hawkweeds now are also established in East Asia, United States, Canada, and New Zealand (Hultén 1968, Rinella and Sheley 2002).

Rational:

Sources of information:

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>

3.5. Extent of the species U.S. range and/or occurrence of formal state or provincial listing

- A. 0-5% of the states 0
- B. 6-20% of the states 2
- C. 21-50%, and/or state listed as a problem weed (e.g., “Noxious,” or “Invasive”) in 1 state or Canadian province 4
- D. Greater than 50%, and/or identified as “Noxious” in 2 or more states or Canadian provinces 5
- U. Unknown

Score

5

Documentation:

Identify states invaded:

Hieracium aurantiacum listed as a noxious weed in British Colombia, Colorado, Idaho, Minnesota, Montana, Quebec, and Washington. *H. caespitosum* is considered a noxious in Idaho, Montana, Oregon, and Washington (Invaders Database System 2003, USDA 2002).

Rational:

Sources of information:

Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. <http://invader.dbs.umt.edu/>

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Total Possible	25
Total	19

4. FEASIBILITY OF CONTROL

4.1. Seed banks

- A. Seeds remain viable in the soil for less than 3 years 0
- B. Seeds remain viable in the soil for between 3 and 5 years 2
- C. Seeds remain viable in the soil for 5 years and more 3
- U. Unknown

Score

3

Documentation:

Identify longevity of seed bank:

Seeds of hawkweeds are viable up to 7 years (Rinella and Sheley 2002).

Rational:

Sources of information:

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>

4.2. Vegetative regeneration

- | | |
|---|---|
| A. No resprouting following removal of aboveground growth | 0 |
| B. Resprouting from ground-level meristems | 1 |
| C. Resprouting from extensive underground system | 2 |
| D. Any plant part is a viable propagule | 3 |
| U. Unknown | |

Score

2

Documentation:

Describe vegetative respond:

The hawkweeds are capable of spreading by rhizomes and stolons and adventitious root buds (Rinella and Sheley 2002).

Rational:

Sources of information:

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

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4.3. Level of effort required

- | | |
|---|---|
| A. Management is not required (e.g., species does not persist without repeated anthropogenic disturbance) | 0 |
| B. Management is relatively easy and inexpensive; requires a minor investment in human and financial resources | 2 |
| C. Management requires a major short-term investment of human and financial resources, or a moderate long-term investment | 3 |
| D. Management requires a major, long-term investment of human and financial resources | 4 |
| U. Unknown | |

Score

3

Documentation:

Identify types of control methods and time-term required:

Mechanical control procedures are generally not successful; digging, grazing or tillage can stimulate the growth of new plants from fragmented roots, stolons and rhizomes. Orange hawkweed can be controlled with herbicides. The site should be monitored for several years for plants growing from root fragments and from seed bank. Small, isolated populations are more easily controlled (Rinella and Sheley 2002).

Rational:

Sources of information:

Rinella, M.J. and R.L. Sheley. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/>

Total Possible

10

Total

8

Total for 4 sections Possible

100

Total for 4 sections

79

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