

Oregon Department of Agriculture
Plant Pest Risk Assessment for
Orange Hawkweed, *Hieracium aurantiacum*
2009

Name: Orange hawkweed, *Hieracium aurantiacum*, a.k.a. orange aster, king devil hawkweed, devil's paintbrush

Family: Aster or Sunflower, *Asteraceae* (*Compositae*)

Findings of This Review and Assessment: Orange hawkweed, *Hieracium aurantiacum*, 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.3.6, orange hawkweed scored **66** indicating a Risk Category of **A**; and a score of **17** with the Noxious Weed Rating System v.3.1, indicating an "**A**" rating.

Introduction: Orange hawkweed, *Hieracium aurantiacum* is not a USDA federally listed noxious weed. It is currently listed as noxious in only seven states though it occurs in all but sixteen states. All the bordering Canadian providences have existing populations. A member of the Asteraceae family, Orange hawkweed grows as a native in the British Isles, South Scandinavia, east to Russia and south to the Mediterranean and occurs commonly in the foothills of the Alps. In Europe it is usually found in mountain meadows and on hillsides. The ancient Greeks believed that the sap of the hawkweeds was responsible for the keen eyesight of hawks. It's believed to have been introduced into the northeastern US in the early 1800's as an herbal remedy and an ornamental. Escaping cultivation, it now occurs in many of the states and providences in North America. Interestingly, research has determined that all populations in North America are genetically identical, indicating that they are part of one giant clone (Loomis and Fishman 2009). Orange hawkweed has spread worldwide including East Asia, United States, Canada, New Zealand and Australia.



The plant is very invasive and can rapidly colonize and dominate where it has escaped from plantings. It invades a variety of different habitats including urban sites, moist meadows, pastures, hay fields, roadsides, gravel pits, forested areas, tree plantations and riparian areas. Plants prefer full sun or partial shade and soils that are well drained. It has not proven to be invasive in dry, shrub-steppe habitats. Plants were occasionally available in the commercial horticulture trade and have been sold and traded generally by small-scale nurseries and gardeners. Nationwide, some Internet sites may still offer the plants for sale, though currently, it cannot be legally sold in Oregon.

*Orange hawkweed flowers, photo by
Tom Forney, ODA*

Growth Habits, Reproduction, and Spread: Orange hawkweed is an attractive bright orange herbaceous perennial plant that flowers in late spring to early summer (May-June). It produces bright orange to orange-red ray flowers with 5 to 30 flower heads in clusters atop each stem. Stems are usually single and unbranched, leafless and grow from 10 to 36 inches tall. The stems contain a milky fluid like dandelions and are covered with black hairs. At the base of the stem a low-growing rosette forms with hairy leaves. Leaves are lance-shaped, hairy on both sides and are dark green on top and light green underneath. The flower heads are one-half to three-quarters of an inch in diameter. A flower head consists of many smaller flowers that are able to produce one seed each. Flower heads close every evening and reopen at mid-morning each day prior to seeding. Every flower head can produce between 12 and 50 small brown or black seeds and has a hairy tuft at one end that allows the seed to be carried by the wind. Seeds are produced both sexually by pollination and asexually without pollination. All seeds are ribbed with minute barbs, which enable them to stick to variety of objects thereby easily moving them. Seeds are able to germinate immediately after dropping from the plant and can remain viable in the soil up to 7 years (USFS 2005). Hawkweeds are capable of completing their life cycles quickly. Seedlings emerging in March can produce flowers by mid-June and viable seeds by early August. Orange hawkweed like all invasive hawkweeds have a shallow and fibrous root systems and an underground creeping root system called rhizomes. The plant rosettes originate from aboveground stolons (that resembles strawberry runners). The stolons radiate out from the original plant and are capable of producing new plants where the runners contact soil; therefore, patch expansion is accomplished primarily by stolon growth and/or rhizomes. Long distance spread is mostly by wind and water born seed or by seeds carried in and on wildlife and livestock. In water, seeds remain buoyant for less than 18 hours.

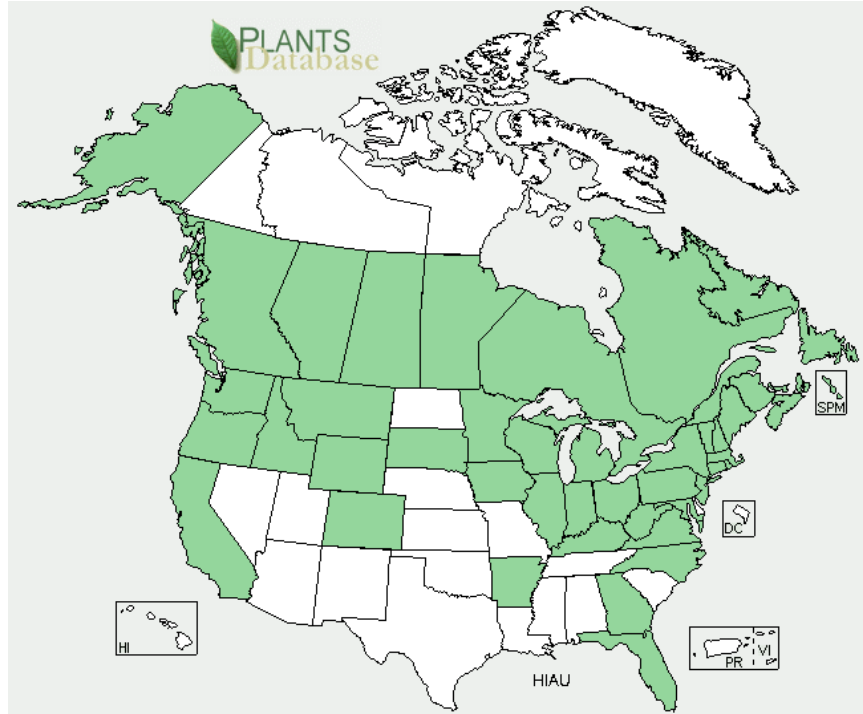
Biological Factors Effecting Growth and Establishment: Grazing animals feed on orange hawkweed though their grazing is insufficient to impact growth and spread. Heavy grazing pressure may actually increase hawkweed density through the removal of competitive grasses and by the ability of hawkweed to hug the ground; avoiding further grazing damage. Insect feeding on hawkweeds is minor to non-existent in many locations. Essentially, orange hawkweed is able to express its full biological potential in Oregon.

Native Range: Orange Hawkweed is native to northern, central and Eastern Europe.

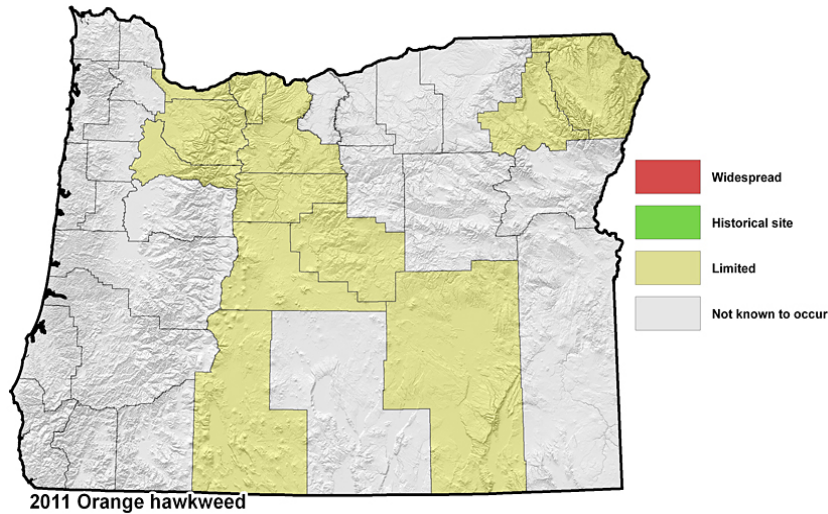
Distribution in North America: Orange Hawkweed was initially introduced into the eastern U.S. and has spread significantly since then. Infestations are now recorded in all but sixteen states and all but four of the most northerly Canadian provinces. The southern prairie states of the U.S. have no recorded locations. Orange hawkweed distribution nationwide indicates the plant thrives best in temperate hardiness zones well into the colder reaches of southern Canada and Alaska. See Attachment A.

The first hawkweed species arrived in the Pacific Northwest as recently as fifty years ago. Oregon's original orange hawkweed site was found at LoLo Pass in Clackamas County in the late 1980's. In 2005, an orange hawkweed site was found in Sisters, Oregon.

Media coverage yielded an additional 15 locations in Bend, Deschutes County. These sites resulted from local nurseries selling orange hawkweed as ornamentals and once discovered, the nurseries had their remaining hawkweed inventory confiscated. In 2009, more media coverage generated an additional 50 sites in Deschutes, Jefferson and Crook Counties. The majority of these new locations were found in the LaPine area in southern Deschutes County with several sites located close to critical habitat along the Deschutes River. Additional infestations resulting from nursery trade have also been located in Jefferson County, Klamath Falls, Burns and in Union County (Langland per.com.2010).



US distribution of orange hawkweed on Plants Database



Oregon's distribution of orange hawkweed on WeedMapper.org

Thousands of acres are present in Idaho and Montana insuring that new introductions will occur regularly due to seed movement on wind currents or agricultural and recreational activities.

Hardiness zones: Orange hawkweed exists in many hardiness zones 6+. See attachment A.

Positive Economic Impact: There are few economic benefits attributed to orange hawkweed. Sold by nurseries as one of the few orange-flowered plants that could grow at high elevations it also serves as a soil or bank stabilizer. Fortunately, it never attained wide market attention. Because of its aggressive growth characteristics, orange hawkweed is declared a noxious weed in Oregon, Washington, Idaho, Montana and British Columbia making it unlawful to transport, propagate and sell.

Negative Economic Impact: Orange hawkweed is invasive in natural or residential areas prompting the need for expensive control programs. Homeowners soon discover that the plant will quickly invade not only flowerbeds, but also their lawns. In this environment, herbicides are often needed for eradication. Hawkweed monocultures may also degrade forest rangeland reducing the amount of forage available to livestock.

Ecological Impacts: Orange hawkweed can invade and colonize a wide variety of habitats including, roadsides, pastures, forest clearings and riparian areas. It creates a dense mat of rosettes replacing both forage in hay fields and pasture, along with displacing native vegetation in open and undisturbed meadows and natural areas. In severe cases, native plant species diversity is reduced, affecting the abundance of associated pollinator insects.

Control: Orange hawkweed can be controlled selectively with herbicides or by digging out small infestations in loose or light soils. The species is easy to control with herbicides with 100% control attained in a single application. Seed soil banks are known to survive up to seven years requiring site monitoring well after all plants have been removed. Mowing can prevent flowering and seed set though sites continue to expand vegetatively from rhizomes and stolons. The main difficulty with hawkweed control arises from the highly mobile nature of the seeds. New infestations may appear in remote locations and not be discovered until they attain a large size. Habitat availability in the Pacific Northwest is enormous with many acres of mixed forestlands at risk. Biocontrol is not currently an option in North America. Biocontrol agents have been released in New Zealand though results have not been determined.

Noxious Weed Qualitative Risk Assessment

Oregon Department of Agriculture

Common name: Orange hawkweed
Scientific name: *Hieraceum aurantiacum*
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: 66 **Risk Category: A**

GEOGRAPHICAL INFORMATION

1) 6 **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 covers large regions or multiple counties.

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 within 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 or a few infestations in state.

BIOLOGICAL INFORMATION

- 5) 4 **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: Highly adapted to a variety of environmental 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, many seeds.

- 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) 5 **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: Potential for rapid natural spread throughout the susceptible range.

- 9) 5 **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 to be introduced or moved within state high.

IMPACT INFORMATION

- 10) 5 **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: Can significantly impact forage and grassland production.

- 11) 5 **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: Can significantly impact meadows and native grasslands.

- 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) 7 **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: Easily identified, introduction probable at remote locations with limited access.

- 14) 3 **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: Herbicide applications provide a high rate of control in a single application.

Category Scores:

22 Geographic score (Add scores 1-4)

24 Biological Score (Add lines 5-9)

10 Impact Score (Add lines 10-12)

10 Control Score (Add Lines 13-14)

66 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: Orange hawkweed

Scientific Name: *Hieracium aurantiacum*

Point Total: 17

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) **5** **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) **3** **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) **3** **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) **4** **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

17 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 1/15/2013 v.3.8

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

References:

Loomis E.S., Fishman L. 2009. A continent-wide clone: Population genetic variation of the invasive plant *Hieracium aurantiacum* (orange hawkweed; Asteraceae) in North America. *International Journal of Plant Sciences* 170(6) pp. 759-765

Orange Hawkweed (*Hieracium aurantiacum*): Minnesota Department of Natural Resources. Available from: <http://www.dnr.state.mn.us/invasives/terrestrialplants/herbaceous/orangehawkweed.html>

Plants Profile for *Hieracium aurantiacum* (orange hawkweed) from the USDA PLANTS database. Available at plants.usda.gov/java/profile?symbol=HIAU

Weed of the week: Orange hawkweed. Produced by the USDA Forest Service, Forest Health Staff, and Newtown Square, PA. 12-18-05 available from: http://www.na.fs.fed.us/fhp/invasive_plants/weeds/orange-hawkweed%20.pdf

Written findings of the state Noxious Weed Control Board: Orange hawkweed. Available from: http://www.nwcb.wa.gov/weed_info/Hieracium_aurantiacum.html

Attachment A

