Oregon Department of Agriculture
Plant Pest Risk Assessment for Giant Hogweed
Heracleum mantegazzianum
May 2009

Name: Giant Hogweed ***(Heracleum mantegazzianum)*** aka. Hogweed, Giant Cow-parsley

Family: Carrot or parsley, *Apiaceae* (*Umbelliferae*)

Findings of this review and assessment: *Heracleum mantegazzianum* has been determined to be a category of **"A"** listed noxious weed as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination is based on two independent risk assessments following a literature review. Using a rating system adapted from United States Department of Agriculture, Animal and Plant Health Inspection Services, Plant Protection and Quarantine (USDA-APHIS PPQ) Weed Risk Assessment Guidelines, Giant hogweed scored **35** out of a potential score of 46. Using the ODA Noxious Weed Rating system, Giant hogweed scored **16.**

Introduction: Giant hogweed *(Heracleum mantegazzianum)* is a USDA federally listed noxious weed and is listed as noxious by twelve states. A member of the carrot family, giant hogweed grows as a native in the Caucasus Mountains, a region of Asia between the Black and Caspian seas. Early in the twentieth century it was introduced and planted as a novel ornamental in arboretums and private gardens in Europe and North America. It soon escaped and naturalized in surrounding areas. It is considered the most widespread and invasive weed in many parts of Europe including England, Scotland, Scandinavia and Germany. In North America it grows in Ontario, Quebec, New York, Michigan, Maine, Pennsylvania, Washington and now in Oregon.

The plant is especially invasive in riparian areas and urban sites where it has escaped from plantings. It is a nuisance in parks and natural areas where it naturalizes. There are active control projects in most of Europe and North America where it has escaped and grows wild. Giant hogweed is considered a public health hazard and causes a phototoxic reaction when skin is exposed to sap and UV-rays. Plants contain a clear watery sap that sensitizes the skin to ultraviolet radiation and affected areas often develop severe sunburns and dermatitis. In severe cases the irritation leads to blistering that result in painful dark purple scars. The scars resemble birthmarks and can last for several years.

The plant's large size and striking structure attracts the interest of gardeners who regard the plant as a novelty. It is occasionally grown as an ornamental. It is not common in the nursery trade and is prohibited or noxious in many states. The USDA and state listings as noxious restrict transport, propagation and sale. Plants are often traded by garden clubs or sold by collectors of unusual plants. Some illegal import occurs. The seed of giant hogweed is used to spice ethnic food. One of the top import violations by passengers traveling form the Middle East is the illegal transport of whole or ground seeds as reported by the Portland office of USDA-APHIS PPQ.

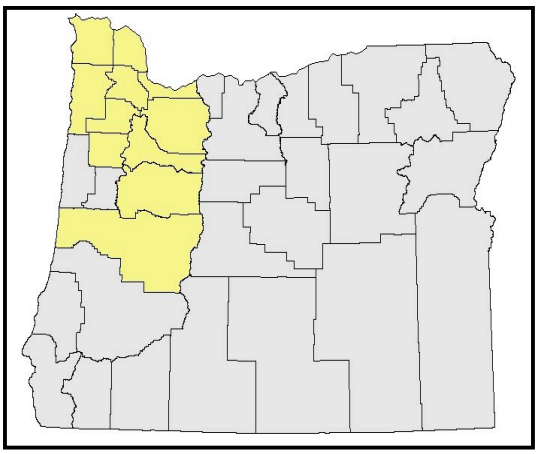
Growth Habits, Reproduction, and Spread: Giant hogweed is a large herbaceous perennial that flowers spring to early summer (May-June). It produces large white multi-flowered stems called umbels that measure 12 to18 inches across. It has a stout tuberous perennial rootstalk that forms buds that grow annually to mature stalks. Giant hogweed can reach a height of 15 feet. Stems are often purple but can vary from entirely purple to mostly green with purple blotches. The surface of the stem is rough with raised blisters and has individual hairs emerging from each bump. This is a key characteristic for identification. Stems are hollow and are two to four inches in diameter. Leaf size, which can be two to four feet in length, can also help distinguish it from look-a-like plants. Cow parsnip, a native species, has a similar appearance but is smaller in size and the stems are ridged and do not have rough raised blisters or bumps. After seed shatter, hogweed plants remain standing but turn brown and die back to the ground by fall. Plants live for several years and reemerge the following spring from the rootstalk.

This plant spreads solely by seeds. Papery disc-shaped seeds disperse near mature plants expanding existing infestations. The seeds are well suited to dispersal by water and float down stream or are blown by wind across waters and lodge on banks to start new infestations.

The seed of giant hogweed are traded for planting and illegal imports occur for use as spice. The majority of sites in Oregon were planted by gardeners that are unaware of its toxic and invasive qualities.

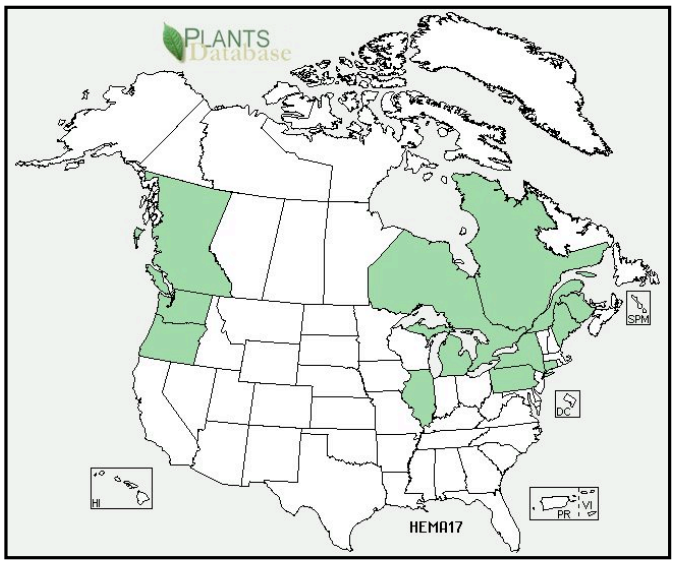
Native Range: Giant hogweed is native to The Caucasus Region and Central Asia.

Distribution in North America: Giant hogweed has been introduced to Canada and the United States. In the east it if found in Ontario, Quebec, New York, Michigan, Maine, and Pennsylvania. In the west it occurs in British Columbia, Washington and Oregon.



The first Oregon giant hogweed sites were found in Lane County in March of 2001. A small infestation was detected in Oakridge and a second site was reported in Eugene. With media attention and an aggressive outreach program, 38 additional sites were reported in the Willamette Valley. Fifty-one sites are reported as of 2009; infestations occur in Lane, Linn, Marion, Clackamas, Multnomah, Polk, Yamhill, Washington, Columbia, Clatsop and Tillamook Counties.

The majority of sites are urban in backyards, roadsides and waste areas. The most heavily infested watershed is the Tualatin in Washington County where plants are found on five miles of Fanno and Vermont Creeks. Riparian infestations have been limited to the Tualatin watershed and the headwaters of Crystal Springs Creek near Reed College in Portland. The reporting of new infestations peaked in 2003. Net affected acres have declined from 20 to less then .25 during this period. Few new sites are reported annually and all known infestations are under treatment or controlled.



Positive Economic Impact: There are few economic benefits associated with giant hogweed. It has some limited use as an ornamental, but is not grown or sold commercially in Oregon. It is on the Federal noxious weed list and several states' noxious and prohibited lists making it unlawful to transport, propagate and sale.

The primary economic value is from the sale of seeds. The seed of *Heracleum* species including giant hogweed are used to make golpar, a Persian spice. The spice is used in Middle East cooking and imparts a distinctive aromatic smell and flavor. The seeds are ground and used as powder. It often is labeled erroneously and sold as "Angelica Seeds." The spice is sprinkled over beans, lentils and potatoes and used to spice soups and stew. It is also a common spice of dressings mixed with vinegar and used for dipping.

Negative Economic Impact: Giant Hogweed is a health hazard. People often develop severe burns resulting in blistering and painful dermatitis that requires medical attention. The plant is invasive in

natural areas and a public nuisance prompting the need for control programs. Heavy stands can impede access to riverbanks and the use of recreation areas. Active control programs occur in the west in Oregon, Washington and British Columbia.

Ecological Impacts: Giant hogweed colonizes a wide variety of habitats but is most common along roadsides, vacant lots, streams and rivers. The most significant impacts occur in riparian areas where hogweed is best suited and readily grows and invades the banks of streams, rivers, lakes and ponds. Heavy infestations compete with and displace native species. Giant hogweed provides poor winter groundcover and can increase erosion during high water events.

Control: Hogweed can be control with herbicide and by digging. Cutting and mowing alone are ineffective due to the large rootstalk and can be a health concern with exposure to toxic sap. The plant is susceptible to several herbicides and is easily controlled. The seeds have a short dormancy and with several years of persistent treatments populations can be eliminated. The most troubling problems with control projects are locating, accessing and applying treatments in riparian and remote places where the plant thrives.

Assessing Pest Risk

The ODA-USDA modified risk assessment identifies several dominant factors that influence plant establishment, reproduction, dispersal and impacts, and then applies numerical value to these factors. The choices taken by reviewers on each topic can often be very subjective and variable based on the knowledge, observations and experience of the reviewer. Every effort was made by the authors to be inclusive in the descriptions as reasonably possible with the expectation that some weeds will not fit well in every category. It is intended that the risk assessment serve as a logical process for governmental agencies and weed control professionals for listing plant species as noxious weeds and to help prioritize target species for control.

ODA Modified USDA - Qualitative Risk Assessment
For
***Heracleum mantegazzianum* (Giant Hogweed)**

(Intermediate scoring may be used e.g. =4)

1. **Habitat availability**:
   Does habitat availability restrict a plant's ability to survive and establish in the analysis area? How much susceptible habitat is available and are their physical or environmental factors that would favor or restrict the ability of the plant to thrive in the available habitats in Oregon? If plant is parasitic, do suitable host plants exist for establishment?

   - High (5) Susceptible habitat is enormous covering large regions or multiple counties in the analysis area *or* limited to a restricted habitat of high economic/ecological value. Plant may demonstrate great adaptability to a variety of environmental conditions.
   - Medium (3) Susceptible habitat encompasses 1/4 or less of the analysis area. Plant only moderately confined by environmental factors such as certain soil types, moisture holding capacity, competing vegetation, and human intervention.
   - Low (1) Susceptible habitat is very limited usually restricted to a small watershed or part of a watershed. Plant is severely confined by certain soil types, moisture holding capacity, competing vegetation, human intervention.

SCORE: 4
Explanation: Susceptible habitat is large. Hogweed can invade habitats currently occupied by its native relative cow parsnip. Plant is adaptable to many site types including riparian, roadsides and ditch banks.

2. **Spread Potential after establishment:**
   Dispersal potential (speed and distance)

   - High (5) Plant has potential for rapid natural spread throughout its susceptible range. Have high reproductive potential and highly mobile propagules. (e.g. Seeds can be wind dispersed over long distance.)
   - Medium (3) Plant has a moderate potential for natural spread with *either* high reproductive potential *or* highly mobile propagules. Propagules spread by moving water or animals.

- Low (1) Plant has potential for *local* spread within a year. Moderate reproductive potential or some mobility of propagules. Animals may move propagules locally, also wind and wave action in lakes.
- Negligible (0) Plant has no potential for natural spread in the analysis area.

SCORE: **3**
Explanation: Plant has a moderate potential for natural spread by seeds.

3. **Economic impact:**
Should consider human health and livestock losses in the HIGH section.

- High (5) Plant has *potential* to cause or *demonstrates* potential to cause *significant* impacts throughout analysis area resulting in reduced crop yield, lowered commodity value, increased cost of production or a loss of markets due to contamination *or* weed also may cause high (larger) financial impacts to recreation, livestock losses, fishing and hunting and property values. Control costs to manage infestations would become significant. Plant directly linked to human health concerns (e.g. poisoning, burns or contribute to increases in vertebrate or invertebrate pests which serve as infectious disease carriers).
- Medium (2) Plant has *potential* to cause or *demonstrates* moderate impacts in few of the above economic categories or moderate to low impacts over a wide range (over 5 types) of economic plants, recreation, products or livestock throughout analysis area.
- Low (1) Plant has potential to cause or demonstrates moderate to low potential impacts throughout analysis area in one or few of the above categories.
- Negligible (0) Plant causes none of the above impacts.

SCORE: 3
Explanation: Demonstrates a potential to escape garden cultivation and establish wild population that can prevent access, displace native flora and requires active control programs to control or contain. Plant is linked to human health concerns.

4. **Environmental impact**:
Descriptions of environmental harm: Causes impacts on ecosystem processes; causes changes in plant community composition; in plant community structure and function; causes indirect impacts that are measured by a reduction in aesthetic value, reduced opportunities for recreation and reductions in other non-monetary values.

- High (5) Plant has *potential* to cause, or *demonstrates* significant impacts in several of the above categories. Or plant causes impacts in select *priority* habitats such as aquatic, riparian, salt marsh, T&E plant sites and other sites deemed critical.
- Medium (2) Plant has *potential* to cause, or *demonstrates* moderate impacts throughout analysis area or impacts occur in less critical habitats.
- Low (1) Plant has *potential* to cause, or *demonstrates* few or minor environmental impacts throughout analysis area or impacts occur in degraded or highly disturbed habitats.
- Negligible (0) None of the above impacts probable.

SCORE: 5
Explanation: Plant has potential to out-compete native flora in critical habitat. It grows, reproduces and disperses most prolifically in riparian zones. Once established seeds disperse and occupy disturbed sites and colonize the watershed. Can limit recreation and access where established.

5. **Likelihood of introduction and spread:**

Entry Potential: The likelihood that an exotic plant will be introduced and spread depends on the number of associated factors, some physical, some biological, some social/economic.
For this analysis, consider the following five factors:

5a. **Weed is a pest in similar climactic zones**: (See attachment 1)

- 5= Plant is known to be a significant pest in similar climactic zones at place of origin *or* demonstrates significant adaptation to multiple climactic zones wherever it is found.
- 3= Plant demonstrates weedy characteristics in non-place of origin areas only. Plant limited to a few climactic zones.
- 1= Plant is strictly limited to one minor climactic area or zone. Plants exhibit little adaptability to new environments or complete information is lacking on plant distribution in climate zones.

SCORE: 4
Explanation: Has become weedy and problematic in many regions of North American and Europe demonstrating the ability to inhabit many climatic zones. Is hardy and tolerant of cold and thrives in temperate regions. It is well suited to the Pacific Northwest and grows in USDA Zone 1 and above.

5b. **Current distribution:**

- 6= Plant population limited to 1 or a few infestations in state or not known to occur but with weedy populations *directly* adjacent to Oregon border.
- 3= Plant regionally established (eastern/western Oregon) with eradication impossible, or weedy populations found in Western US regions but not *directly* adjacent to Oregon border.
- 1= Plant widespread, occurs throughout the state with containment improbable or weedy populations mostly found in more distant US regions or foreign country only.

SCORE: 4
Explanation: Weedy populations found in Washington State and occur in eleven western Oregon counties. Plants can be controlled and Oregon populations are declining making eradication reasonable.

5c. **Probability of detection at introduction point**:

- 3= Plant populations growing with high probability of no initial detection, plant shape and form obscure/not showy for much of growing season, introduction probable on lands remote or with limited access to weed professionals.
- 2= Plant easy to identify by weed professionals, ranchers, botanists, some survey and detection infrastructure in place.
- 1= Plants growing where probability of rapid detection high, plants showy, public easily recognizes plant, access not limited.

SCORE: 2
Explanation: Weed is large and showy and is likely to be detected, but a look-a-like native, cow parsnip, makes initial detection somewhat limited. Plant can grow in areas that difficult to access and survey.

5d. **Probability of weed import or movement to suitable habitat through *human* activities**:
Does not consider transport by recreation, equipment and vehicles; you may choose to address that here.

- 3= high probability that weed will be introduced or moved within state annually. Plant widely propagated, highly popular and widely sold or traded or plant propagules are a common contaminant of agricultural commodities. Or, high potential exists for movement by contaminated vehicles and equipment or by recreation.
- 2= moderate probability of introduction or off-site movement. Plant not widely propagated, not highly popular with limited market potential or may be a localized contaminant of gravel or landscape products.
- 1= low probability of introduction or movement. Plant not traded or sold or plant not found in agricultural commodities, gravel or other commercial products.

SCORE: 2
Explanation: Seed is not windblown and would require human activities for long-distance transport. Plants and seeds are traded and sold to a limited extent for ornamental use and illegal imports occur for use as spice. The dumping of yard debris can contributed to the spread.

5e. **Environment and reproductive potential:**

- 5= Environment possesses ideal conditions for growth and reproduction. Plant expresses full growth and reproductive potential in environment. If dioecious then both sexes present and plant is self-fertile.
- 2= Environmental factors restrict full growth and reproductive potential and plant is poorly or clearly not self-fertile.
- 1= Environmental factors damage plant growth and/or prevent reproduction. Obligate pollinator not present.

SCORE: 5
Explanation: The Pacific Northwest climate provides ideal growing conditions for reproduction and spread. The plant is not limited by environmental factors and thrives in both riparian and dryer upland sites.

SCORE = Subtotal of 5 = 17

6. Current Distribution:

- 5= Not known to occur, or limited to 1 or a few infestations in the state.
- 3= Regionally abundant (eastern/western Oregon).
- 1= Widespread, occurs throughout the state.

SCORE: 3

The total assessment score for *Scientific name* (out of a possible 46) with the modified ODA-USDA Risk Assessment is**: 18+17= 35**

"A" 35 - 41 "A" Weed 25 - 34 "B" Weed Below 24: unlisted

Oregon Department of Agriculture
Noxious Weed Rating System

Giant Hogweed	*Heracleum mantegazzianum*
Common Name	**Scientific Name**

Points Category:

1) **3 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) **4 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) **2 Distribution:** Circle the number that best describes, enter that number

1. Widely distributed throughout the state in susceptible habitat
2. Regionally abundant in part of the state, 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

TOTAL POINTS: 16

Note: Noxious weeds are those non-native plants with total 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

Acknowledgments:

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Contributing Text: Glenn Miller, Oregon Dept. Agriculture, and Beth Myers-Shenai, Former Oregon Dept. Agriculture

Photos by: Thomas Forney, Fanno Creek 2006

References:

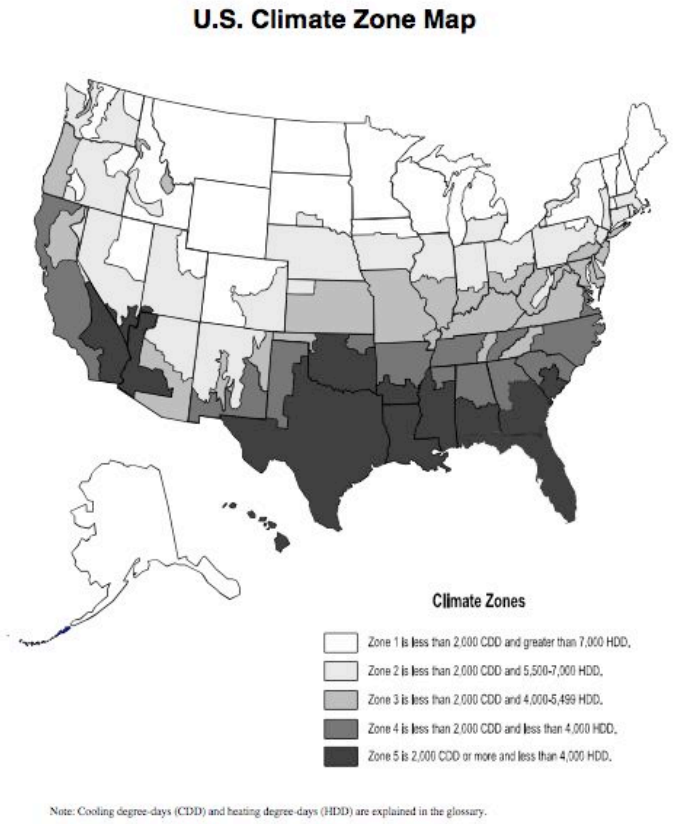
Anonymous. 1993. Written Findings of the Washington State Noxious Weed Control Board for *Heracleum mantegazzianum* (Giant Hogweed). Tech. Washington State. Available at: <http://www.nwcb.wa.gov/weed_info/written_findings/CLASS%20A%20PDFs/Heracleum%20mantegazzianum%201998.pdf>.

PLANTS Database. 2009. "PLANTS Profile for Heracleum mantegazzianum (giant hogweed) | USDA PLANTS." Welcome to the PLANTS Database | USDA PLANTS. Available at: <http://plants.usda.gov/java/nameSearch?keywordquery=giant+hogweed&mode=comname&submit.x=12&submit.y=11>.

Tasker, Alan. 2008. "Giant hogweed Factsheet". USDA Natural Resources Conservation Services. Available at: <http://www.aphis.usda.gov/publications/plant_health/content/printable_version/fs_phhgweed.pdf>.

Nielsen, C., H.P. Ravn, W. Nentwig and M. Wade (eds.), 2005. The Giant Hogweed Best Practice Manual. Guidelines for the management and control of an invasive weed in Europe. *Forest & Landscape Denmark*, Hoersholm, 44 pp.

Nicholas A. Page, Ronald E.Wall, Stephen J. Darbyshire, and Gerald A. Mulligan. 2005. "The Biology of Invasive Alien Plants in Canada." New York State Department of Environmental Conservation. Raincoast Applied Ecology, 102-1661 West 2nd Avenue, Vancouver, British Columbia, Canada, V6J 1H3. Access online at: <http://www.dec.ny.gov/docs/lands_forests_pdf/ghcanadareport.pdf>.

WeedMapper. 2009. weedmapper.org: general maps for giant hogweed. The WeedMapper Team and Dept. of Rangeland Ecology and Management, Oregon State University, Corvallis, Or. Available at: <http://www.weedmapper.org/hema17.html>.

Attachment 1