Giant Hogweed (*Heracleum mantegazzianum*) - Poisonous Invader of the Northeast

NYSG Invasive Species Factsheet Series: 07-1

Charles R. O'Neill, Jr.
Invasive Species Specialist
New York Sea Grant
February 2007, Revised August 2009

New York Sea Grant
SUNY College at Brockport
Brockport, NY 14420
Tel: (585) 395-2638
Fax: (585) 395-2466

Introduction

Should you be walking along a damp abandoned railroad right-of-way, a wet roadside ditch or a stream bank and stumble upon a plant that looks like Queen Anne's Lace with an attitude – more than 10 feet tall with two-inch thick stems, flowers two or more feet across and leaf clusters as wide as you can stretch your arms – stay clear! You have just become one of an increasing number of New Yorkers who have met the state's most striking, and dangerous, invasive plant, the giant hogweed (*Heracleum mantegazzianum*) and you absolutely do not want to touch it and take it home to the family. Giant hogweed can make a case of poison ivy seem like a mild itch.

Photo: Randy Westbrooks, USGS

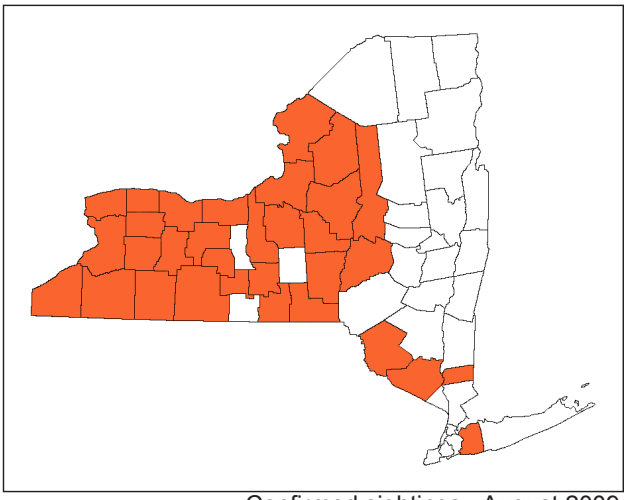
History and Distribution

A member of the carrot and parsley family of plants (Apiaceae), giant hogweed is native to the Caucasus region of Eurasia. Because of its unique size and impressive flower head, the plant was originally introduced to Great Britain as an ornamental curiosity in the 19th century. The plant is named after the mythological god, Hercules (he of robust size and strength). It was later transported to the United States and Canada as a showpiece in arboreta and Victorian gardens (one of the plant's first North American plantings of giant hogweed was in gardens near Highland Park in the City of Rochester, New York). It was also a favorite of beekeepers because of the size its flower heads (the amount of food for bees is substantial). A powder made from the dried seeds is also used as a spice in Iranian cooking. Unfortunately, as with so many invasive plants, giant hogweed escaped cultivation and has now become naturalized in a number of areas, including: Broome, Cattaraugus, Cayuga, Chautauqua, Erie, Genesee, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Nassau, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Putnam, Schuyler, Steuben, Sullivan, Tioga, Tompkins, Wayne, Wyoming, and Yates Counties in New York; Connecticut; the

Heracleum mantegazzianum

District of Columbia; Illinois; Maine; Maryland; Massachusetts; Michigan; Ohio; Oregon; Pennsylvania; Washington; Wisconsin; and the Canadian Provinces of British Columbia, New Brunswick, Ontario and Quebec.

Because of its public health hazard potential and, to a lesser extent, to its potential ecological impacts, giant hogweed is on the federal noxious weed list and several state lists of prohibited plant species.



Confirmed sightings - August 2009

Biology and Habitat

Giant hogweed (*Heracleum mantegazzianum*) is a member of the carrot or parsley family, Apiaceae (Umbelliferae). Except for its size, the plant can be mistaken for a number of native, noninvasive plants such as cow parsnip (*Heracleum lanatum*), Angelica (*Angelica atropurpurea*), and poison hemlock (*Conium maculatum*). Of these, the plant most likely to be misidentified as giant hogweed is cow parsnip. A fourth, not so innocuous, invasive giant hogweed imposter found throughout North America is wild parsnip (*Pastinaca sativa*). Information on how to distinguish these giant hogweed wannabees from the real thing can be found later in this factsheet.

Photo: Terry English, USDA APHIS PPQ

Giant hogweed is a perennial herb with tuberous root stalks. It survives from one growing season to another by forming perennating buds (surviving from season to season) and enduring a period of dormancy during the winter. The plant develops numerous white flowers that form a flat-topped, umbrella-shaped head up to two and a half feet across, resembling "Queen Anne's Lace on steroids." Flowers form from late-spring through mid-summer. Numerous (up to 100,000), half inch long, winged, flattened oval seeds form in late-summer. These seeds, originally green, turn brown as they dry and can be spread by animals, surface runoff of rain, or on the wind, establishing new colonies. Seeds can remain viable in the soil for up to 10 years. The plant's stems die in the fall and remain standing through the winter, topped with the huge, brown dead flower heads.

Giant hogweed leaves can be up to five feet across.
Photo: Thomas B. Denholm, NJDA

Giant hogweed's thick hollow stems are generally one to three inches in diameter but can reach four inches. Also impressive are the plant's lobed, deeply incised compound leaves, which can reach up to five feet in width. The plant may grow to 15 to 20 feet in height.

Giant hogweed can colonize a wide range of habitats but prefers rich, damp soil such as that found along abandoned railroad rights-of-way, roadside ditches, stream banks, or other moist disturbed areas. Because of this predilection for wet areas, the plant is considered to be an aquatic invasive species.

IDENTIFICATION

As mentioned earlier, there are several plants in New York and the Northeast that can be mistaken for giant hogweed. Key features for distinguishing these plants from giant hogweed are explained below. Comparisson photographs can be found in tables on pages 4 and 5.

Giant hogweed may grow to 15 to 20 feet in height. Stems are 1 to 3 inches in diameter, but may reach 4 inches. Stems are marked with dark purplish blotches and raised nodules. Leaf stalks are spotted, hollow, and covered with sturdy bristles (most prominent at the base of the stalk). Stems are also covered with hairs but not as prominently as the leaf stalks. Leaves are compound, lobed, and deeply incised; can reach up to 5 feet in width. Numerous white flowers form a flat-topped, umbrella-shaped head up to two and a half feet across. [Photos, page 4]

Native **Cow parsnip**, while resembling giant hogweed, grows to only five to eight feet tall. The deeply ridged stems can be green or slightly purple, do not exhibit the dark purplish blotches and raised nodules of hogweed, and only reach one to two inches in diameter, contrasted with hogweed stems which can reach three to four inches in diameter. Where giant hogweed has coarse bristly hairs on its stems and stalks, cow parsnip is covered with finer hairs that give the plant a fuzzy appearance. Both sides of the leaves exhibit these hairs but they are predominantly on the underside of the leaves. In contrast to hogweed's two to two and a half foot flower heads, cow parsnip flower clusters are less than a foot across. The size difference carries over into leaf size with hogweed's five foot, deeply incised leaves replaced by leaves that are less incised and only two to two and a half foot across. [Photos, page 4]

Native **purple-stemmed Angelica** is more easily differentiated from giant hogweed by its smooth, waxy green to purple stems (no bristles, no nodules), and its softball-sized clusters of greenish-white or white flowers, seldom reaching a foot across. As with cow parsnip, Angelica is much shorter than giant hogweed, usually no more than eight feet tall. Angelica leaves are comprised of many small leaflets and seldom reach more than two feet across. [Photos, page 4]

Poison hemlock, a non-native biennial, is also shorter than giant hogweed, growing to only four to nine feet in height. While the stem has some purple blotches, it is waxy and the entire plant (stems, stalks, leaves) is smooth and hairless. The leaves are dramatically different from those of hogweed, being fern-like and a bright, almost glossy, green. All branches have small flat-topped clusters of small white flowers. Another distinguishing characteristic is poison hemlock's unpleasant mouse-like odor. The entire plant is toxic, and the volatile alkaloids can even be toxic when inhaled. [Photos, page 5]

Wild parsnip, like giant hogweed, is of special concern because it, too, can cause phytophotodermititis, only not usually as severe as that of giant hogweed. This plant can be found extensively throughout NY's Southern Tier, in the region east of Lake Ontario, some Central and Western NY counties, parts of the Catskills and counties east of the Hudson River. Unlike the perennial giant hogweed, wild parsnip is a biennial, producing a rosette of leaves close to the ground in its first year and a single flower stalk with a flat-topped umbel with clusters of yellow flowers in its second year. The plant reproduces by means of the seeds of these flowers; it does not regrow from its root as does giant hogweed. Wild parsnip is much smaller than giant hogweed, seldom exceeding 5-feet in height. Wild parsnip stems are yellowish-green with verticle grooves running their length. Wild parsnip has compound pinnate leaves with 5 to 15 toothed and variably lobed yellowish-green leaves. [Photos, page 5]

IMPACTS

Giant hogweed is one of a very few North American invasive plants that can cause human health impacts as well as ecological damage.

GIANT HOGWEED			
			
HEIGHT **15 to 20 feet**	**STEM** **1 to 3 inch diameter** **Purple blotches, stiff bristles**	**LEAF** **Compound, lobed, deeply incised; up to 5 feet wide**	**FLOWER** **White flowers, flat-topped, umbrella, up to 2.5 feet across**

COW PARSNIP			
			
HEIGHT **5 to 8 feet**	**STEM** **1 to 2 inch diameter** **Deeply ridged, green to slightly purple, fine hairs, fuzzy**	**LEAF** **Compound, less incised, 2 to 2 1/2 feet across, fuzzy hairs**	**FLOWER** **Whitish flower clusters no larger than 1 foot across**

ANGELICA			
			
HEIGHT **4 to 9 feet**	**STEM** **Smooth, waxy green to purple (no bristles), 1 to 2 1/2 inch diameter**	**LEAF** **Many small leaflets, seldom more than two feet across**	**FLOWER** **Softball-sized clusters, greenish-white or white, up to 1 foot across**

POISON HEMLOCK			
			
HEIGHT **4 to 9 feet**	**STEM** **Smooth and hairless, waxy green, some purple splotches, 1 to 2 inch diameter**	**LEAF** **Fern-like, bright, almost glossy, green**	**FLOWER** **All branches have small flat-topped clusters of small white flowers**

WILD PARSNIP			
			
HEIGHT **Up to 5 feet**	**STEM** **Yellowish-green with verticle grooves running full length**	**LEAF** **Compound, pinnate, 5 to 15 toothed, variably lobed, yellowish-green**	**FLOWER** **Single flower stalk with flat-topped umbel of clustered yellow flowers**

Ecological Impacts

Colonies of giant hogweed can become quite dense owing to the plant's prolific seed production and rapid growth rate. Such dense stands crowd out slower growing plants, the thick hogweed canopy displacing native plants that need direct sunlight to grow. The decreased abundance of beneficial native plants can reduce the utility of the area for wildlife habitat. When riparian plants are displaced, stream bank erosion can increase and streambeds can be covered with silt.

Human Health Impacts

Giant hogweed is one of a handful of plants in the Northeast that can cause a significant reaction when humans come in direct contact with the plant. Spread of this plant in urban and suburban areas is viewed as an incipient public health hazard. [Wild parsnip can result in almost as severe reactions.]

Soon after humans bruise the leaves or stems of the more common poison ivy, poison oak, and poison sumac, an allergic reaction to the plants' poisonous oil (akin to carbolic acid) causes significant skin

irritation, itching, rashes and open sores. In the case of giant hogweed, however, the skin inflammation is not caused by simply brushing against the plant's leaves or stems. For giant hogweed to affect a person, sap from a broken stem or crushed leaf, root, flower or seed must come into contact with moist skin (perspiration will suffice) with the skin then being exposed to sunlight. Irritation is not immediate, but will usually appear within one to three days after exposure. This form of skin irritation (dermatitis) is called "phytophotodermatitis". The plant's clear, watery sap contains a glucoside called furanocoumarin that is a psoralen. Psoralens sensitize the skin to ultraviolet radiation and can result in severe burns, blistering, painful sores, and purplish or blackened scars. These phototoxic effects are the result of the binding of the psoralens to nuclear DNA under the influence of ultraviolet irradiation, and the subsequent death of affected cells.

The first signs of giant hogweed-caused photodermatitis are when the skin turns red and starts itching. Within 24 hours, burn-like lesions form, followed by large, fluid filled blisters within 48 hours. The initial irritation usually will subside within a few days, but affected areas may remain hypersensitive to ultraviolet light for many years and re-eruptions of lesions and blisters may occur. On rare occasions, particularly in very sensitive individuals, the burns and blisters may be bad enough to require hospitalization. A side effect of exposure to the psoralens is the production of excessive amounts of melanin in the skin, resulting in residual brown blotches called hyper-pigmentation; scars and brown to black blotches may last for several years. The worst risk of exposure to giant hogweed is to one's eyes - getting even minute amounts of the sap in the eyes can result in ttemporary or even permanent blindness. Medical help should be sought immediately; by the time symptoms of burning and hypersensitivity to sunlight are apparent, the damage could already be irreversible.

The only known antidote to contact with the sap is to immediately wash skin thoroughly with soap and water, removing the sap and hopefully preventing any reaction with subsequent exposure to sunlight. Once the irritation begins, medical advice should be sought. Treatment with prescription topical steroids early on may reduce the severity of a person's reaction. It will also be important to cover the burns and blisters with light sterile dressings to prevent infection. Long-term, use of sunblock in subsequent years may be required to prevent sensitization by sunlight again.

People most at risk include landscape technicians and yard maintenance laborers who may come in contact with the sap when cutting the plant down or using line trimmers to control new growth. Children breaking off the long, bamboo-like stems to use as play swords are also at great risk. However, sometimes direct contact with the plant is not necessary for a reaction. Farmers have been known to develop symptoms when they touch cows who have gotten the sap on their skin while grazing (cows, themselves, seem impervious to the sap). The best prevention measure is to wear long sleeves and long-legged pants when contact with the plant is a possibility.

CONTROL

If it weren't for giant hogweed's public health impacts, the plant most likely would not be worth the effort of controlling it. Although it does have ecologic impacts, they are not as severe as many other wetland invasive plants. However, the health impacts can be severe and the plant has found itself on the federal noxious weed list and several state lists, as well. It is a particular target of parks and transportation/highway departments' invasive plant eradication efforts. Such eradication programs can incorporate a combination of physical removal and chemical control. If undertaken properly, such programs can be done without harm to humans or damage to the environment. Recently some landowners have been

known to refuse permission to allow highway departments to chemically treat giant hogweed thickets. It is believed that this is usually a case of lack of knowledge on the landowner's part.

Giant hogweed is very difficult to eradicate. Although the stems, stalks, leaves and flowers can be killed with a number of common selective herbicides, such as 2,4-D (the third most-often used herbicide in North America), dicamba (a benzoic acid herbicide), TBA (terbuthylazine) and MCPA, these herbicides are not effective at killing the plant's tuberous perennial roots. Another common, selective broadleaf herbicide, triclopyr (a common brand name is Brush-B-Gone®), is also effective, particularly when applied directly to the entire surface of leaves and stems during periods of active growth; numerous applications may be needed to kill the root stalk. Cornell Cooperative Extension recommends early application (during the bud stage and the period of active plant growth) of glyphosate (commonly sold under the trade names Rodeo® and Roundup®). Care should be taken when using any herbicides to control giant hogweed; particular care should be taken when using glyphosate as it is nonselective and will kill both the hogweed and desirable plants such as grass.

For those hesitant to utilize herbicides, giant hogweed can be managed using various "cultural" methods. Unfortunately, owing to the plant's persistence and spread by blowing seeds, such control can take many seasons worth of effort to achieve 100% control. Individual plants can be dug out, removing the entire rootstalk, a difficult process, particularly in patches where the plant has spread by root growth. Mowing, cutting and use of line trimmers can be used to remove a standing crop and starve the rootstalk. Unfortunately, unless performed numerous times during a season, mowing only serves to stimulate budding on the rootstalk. All of these methods should be done with extreme care and only while wearing protective clothing and eye protection. Skin contact with soiled clothing should also be avoided. Biocontrol by grazing cows and pigs (which are apparently not affected by the plant's sap) may also help to manage but not eliminate the plant. Care should be taken not to get sap on uncovered skin when touching livestock after the animals contact crushed or bruised hogweed.

Control of wild parsnip is less difficult than controlling giant hogweed because as a biennial, wild parsnip reproduces only from seed, not from its rootstock. This plant can be controlled by cutting the stem from the root below ground level with a shovel, spade or machete before the seed head matures.

And If All of That Isn't Strange Enough…

Very few invasive species get immortalized in song. Giant hogweed is an exception. In 1971, Genesis released their album "Nursery Cryme" which includes the song "The Return of the Giant Hogweed."

"Turn and run! Nothing can stop them,
Around every river and canal their power is growing.
Stamp them out! We must destroy them,
They infiltrate each city with their thick dark warning odour.

Waste no time! They are approaching.
Hurry now, we must protect ourselves and find some shelter
Strike by night! They are defenseless.
They all need the sun to photosensitize their venom.

They are invincible, They seem immune to all our herbicidal battering."

If you find giant hogweed in NYS, you are encouraged to call NYS DEC's Giant Hogweed Hotline:

845-256-3111

Heracleum mantegazzianum

References

Anon. Giant Hogweed (*Heracleum mantegazzianum*). Written Findings of the State Noxious Weed Control Board - Class A Weed. State of Washington. 4 pp.

Camm E, et al. 1976. Phytophotodermatitis from *Heracleum mantegazzianum*. Contact Dermatitis. 2, 68-72.

Davies DHK, Richards MC. 1985. Evaluation of herbicides for control of giant hogweed (*Heracleum mantegazzianum* Somm & Lev.), and vegetation re-growth in treated areas. Tests of Agrochemicals and Cultivars. Annals of Applied Biology. (6):100-101.

Genesis. 1971. The Return of the Giant Hogweed.

Hypio, P, Cope, E. 1982. Giant Hogweed, *Heracleum mantegazzianum*. Cornell Cooperative Extension. Misc. Bulletin 123.

Kees H, Krumrey G. 1983. *Heracleum mantegazzianum* - ornamental plant, weed and poisonous plant. [toxicity to livestock and humans, control]. Gesunde Pflanzen. Kommentator.3 5(4):108-110.

Northall F. 2003. Vegetation, Vegetables, Vesicles: Plants and Skin. Emerg. Nurse. 11(3):18-23.

Informational Links

Giant Hogweed - Overview, Invasive Plant Council of New York State: http://www.ipcnys.org/sections/target/giant_hogweed_overview.htm

Giant Hogweed (*Heracleum mantegazzianum*), Written Findings of the State Noxious Weed Control Board - Class A Weed: http://www.nwcb.wa.gov/weed_info/Written_findings/Heracleum_mantegazzianum.html

Potential Health Hazard, Giant Hogweed (*Heracleum mantegazzianum*). Allegany/Cattaraugus Home Grounds & Gardens, Cornell Cooperative Extension: http://counties.cce.cornell.edu/allegany_cattaraugus/hort/PestAlert.htm

Photograph and Graphics Credits

Page 1: Randy Westbrooks, U.S. Geological Survey, www.forestryimages.org
Map, page 2: New York Sea Grant
Page 2, right: Terry English, USDA APHIS PPQ, www.forestryimages.org
Page 2, left: Thomas B. Denholm, New Jersey Department of Agriculture, www.forestryimages.org
Page 3: USDA APHIS PPQ, www.forestryimages.org
Giant Hogweed Table, left to right:
- Terry English, USDA APHIS PPQ @ www.forestryimages.org
- Cornell Cooperative Extension - Allegany/Cattaraugus Counties
- Donna R. Ellis, University of Connecticut @ www.forestryimages.org
- Terry English, USDA APHIS PPQ @ www.forestryimages.org

Cow Parsnip Table, left to right:
- UMASS Extension @ http://www.umassgreeninfo.org/index.html
- James Altland, Oregon State Univ. North Willamette Research & Extension Center
- UMASS Extension @ http://www.umassgreeninfo.org/index.html
- Dave Powell, USDA Forest Service @ www.forestryimages.org

Angelica Table, left to right:
- Virginia Kline, University of Wisconsin, Madison, Dept. of Botany
- Flora of the Northeast United States @ www.web.syr.edu
- Flora of the Northeast United States @ www.web.syr.edu
- Albert FW Vick Jr., Native Plant Information Network @ www.wildflower2.org

Poison Hemlock Table, left to right:
- Dan Tenaglia @ www.missouriplants.com
- Dan Tenaglia @ www.missouriplants.com
- Patrick J. Alexander @ USDA-NRCS PLANTS Database
- Brother Alfred Brousseau, St. Mary's College of CA @ USDA-NRCS PLANTS Database

Wild Parsnip Table, left to right:
- Linda Haugen, USDA Forest Service @ www.forestryimages.org
- Dan Tenaglia @ www.missouriplants.com
- Patrick J. Alexander @ USDA-NRCS PLANTS Database
- UMASS Extension @ http://www.umassgreeninfo.org/index.html

Sea Grant New York

New York Sea Grant
SUNY College at Brockport
Brockport, NY 14420
Tel: (585) 395-2638
Fax: (585) 395-2466