



## GOOD PRACTICE MANAGEMENT

Giant Hogweed (*Heracleum mantegazzianum*)





# GOOD PRACTICE MANAGEMENT GUIDE FOR Giant Hogweed (*Heracleum mantegazzianum*)

**Other names:** Giant cow parsnip, cartwheel flower; and numerous Latin synonyms including *H. giganteum* and *H. speciosum*

**For ID guides and more information:**

[www.snh.org.uk/speciesactionframework](http://www.snh.org.uk/speciesactionframework)

<https://www.cabi.org/isc/datasheet/26911>

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1705>

<https://www.nature.scot/integrated-pest-management-nature-conservation-handbook>



Giant Hogweed (*Heracleum mantegazzianum*)

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# MANAGEMENT SUMMARY

## Ecology and impact of Giant Hogweed



**General impact:** Giant Hogweed is a vigorous and widespread invasive species in Britain, which also poses a health risk to the public. This plant is often associated with riparian habitats, where waterways can provide corridors along which it can spread. As well as river margins, it can also be found on roads and railways, derelict land and rubbish tips. Giant Hogweed has the ability to cause recurring painful skin blistering on the slightest touch through sensitisation to sunlight. This plant can also cause other problems by growing in dense stands absorbing up to 80% of sunlight, suppressing and outcompeting native vegetation, thereby reducing plant and invertebrate diversity.

Owing to its height and rapid growth rate (it can reach 4–5m in height), Giant Hogweed can suppress all plants other than trees and shrubs, mostly through shading them out. Dense stands can also restrict access to amenity areas and riverbanks and reduce sightlines on roads.

Furthermore, dense colonies die back and leave banks bare of vegetation in winter increasing the risk of erosion and flooding, as well as re-colonisation from seeds washed downstream. The death of the plant stem often loosens the surrounding soil, so that in high density stands, it can result in whole sections of riverbank being washed out. Seeds are easily dispersed by water, especially during a flood and as seed production is high they can rapidly infest bare areas of bank.

The effects of losing the native riparian vegetation and the resulting bank erosion are many and far reaching, including physical impacts on the geomorphology of the river, increased sedimentation, changes in temperature and decreases in invertebrate and fish populations. In addition to this, it is thought that furanocoumarins (toxic chemicals produced by the plant as a defence against insect herbivory) may be a cause of loss of insect biodiversity in dense stands of this species. These chemicals (as well as being a public health hazard) are also known to be antifungal, possibly explaining their presence in the roots. This may lead to suppression of soil fungi, which is essential for soil fertility



# MANAGEMENT SUMMARY

## Ecology and impact of Giant Hogweed (cont)

**Ecology in the context of management:** Giant Hogweed is a pioneer species that greatly benefits from human disturbance of habitats. The climate in Britain is ideal, as it prefers temperate, moist conditions, with a cold winter to initiate germination. The seeds have been known to germinate in Britain up to 600m in altitude. This species prefers high nutrient (particularly nitrogen) and moisture levels, but can tolerate a range of pH values and soil conditions. It will grow in semi-shade but does not tolerate heavy shading. As a perennial species, Giant Hogweed has a vegetative phase of 3 to 4 years before flowering (and reproduction) and subsequent death of the plant.

Seedlings appear as early as late January, producing immature plants, reaching 0.4 m in their first year. Foliage dies back in September/October and subsequent growth from tap roots is very rapid in the second and third years. The roots of Giant Hogweed are up to 60cm deep. Giant Hogweed does not flower until the second or third year, or longer if conditions are unfavourable. Flowering stalks start to elongate in May, with peak flowering in June/July. Seed production is prolific and they are generally dispersed by water, though wind dispersal can occur when seeds are blown over hard surfaces and they also can attach to animal fur. Seeds can be very prevalent in the soil, particularly after years with large amounts of flooding. The length of time that seeds can remain viable in the seedbank is contested, but several sources agree that a fraction of the seeds have been shown to remain viable at least as long as two years. Given the high fecundity of Giant Hogweed, a single plant germinating from a seed bank could start a new invasion.

When carrying out management of Giant Hogweed, the aim should be to kill the plant or prevent flowering, as well as in the long-term deplete the seed bank in the soil. Repeated treatment may be necessary during the growing season to prevent flowering. The importance of preventing Giant Hogweed from flowering (and subsequently setting seed) cannot be stressed highly enough as each flowering plant can produce approximately 10,000 – 100, 000 seeds (actual numbers are somewhat debated). This is essential, as Giant Hogweed can only reproduce via seed. Even umbels cut at late flowering or early fruiting can regenerate and are able to produce viable seeds (though a reduced amount). Giant Hogweed in the United Kingdom cannot self-pollinate.



# MANAGEMENT SUMMARY



## Effective Management: Summary

When managing Giant Hogweed, it is best to use a multifaceted and adaptive approach. Select control methods that realistically reflect the available time, funding, and labour of the participants, the land use goals, as well as the values of the community and landowners. Management will require dedication over a number of years and should allow for flexibility in method as appropriate. A Giant Hogweed control strategy should aim to kill existing plants and deplete the remaining seedbank to ensure further problems do not develop. A control strategy should last as long as the seedbank remains viable (at least 2 years).

It is best to tackle Giant Hogweed at a catchment scale approach, working from the top of the catchment to the bottom. The main vector for spreading Giant Hogweed (outwith human interference) is the physical movement of seeds down watercourses. This can become difficult if a catchment encompasses multiple administrative and/or national boundaries. An understanding of distribution in the wider area is necessary to determine if eradication or control efforts are likely to be successful. Working in partnership with neighbouring landowners is critical when tackling Giant Hogweed, to prevent re-colonisation.

The site specific timing of control work is critical as Giant Hogweed can start to grow at any time from the end of January through to the beginning of July and will not necessarily all start to grow at the same time on the same site. The optimum time for Giant Hogweed control is from early/mid-April to early/mid-May before flowering begins. It is critical to wait until at least mid-April to start control work to allow the later sprouting plants time to emerge otherwise control work will need be repeated because sprouting times of over wintering Giant Hogweed plants is staggered. This theory is backed up by trials carried out by the Tweed Forum, where seeds from the same parent plant, kept in identical conditions, started to germinate as early as February and continued to germinate right the way through into July.

After flowering begins, the work becomes even more laborious requiring cutting of the plants and destroying the flowerheads before spraying. This work also requires calm, dry weather. Additionally, if control is carried out at this optimum time of year, then natural regeneration of the site could occur before the floods of the following winter. This possibility can allay the fears of those worried that they will accelerate erosion by removing the little vegetation left.



# MANAGEMENT SUMMARY

## Effective Management: Summary (cont)

As with any INNS management work, it is important to monitor in the weeks following treatment to assess success and apply spot treatments on late germinators or plants that have been missed. Further repeated treatment may be necessary during the growing season to prevent flowering. There is some disagreement on how long it will take to eradicate a stand of Giant Hogweed from a site and a large part of this will depend on the efficacy of the methods used and the status of the hogweed population in the surrounding area. In a small, isolated population, using chemical treatment, it is thought that local eradication can be achieved in four years.

Combinations of control methods can be more efficient than a single method. For example, if an early glyphosate spraying of a large colony has resulted in minor regrowth, an additional treatment of mowing or cutting by scythe of the surviving plants can replace a second glyphosate application. In contrast, a colony that has grown too tall and dense is unsuitable to treat efficiently with glyphosate due to the protection of smaller plants provided by larger mature plants and the health hazard which the plants represent to operators. If the plants are cut to ground level, a follow-up spot treatment of regrowth with hand held equipment is preferable.

When deciding on management for Giant Hogweed, it is important to consider whether to prioritise large dense stands that produce enormous numbers of seeds, or small outlier plants or patches likely to expand into dense infestations. If tackling both is not feasible due to resource limitation, then priorities need to be set. In general, it is advisable to clear out the small colonizer patches first before tackling the large dense patches. The rate of expansion of the former will be more rapid than the latter, if the conditions are suitable for invasion.

**Health and Safety:** Given health and safety concerns with controlling Giant Hogweed and additional training required for chemical spraying treatment, this species may be less suitable for volunteers. If the budget is available, volunteers can be trained. ***For more information on the health risks associated with working with Giant Hogweed, training requirements and recommended PPE, please see Health and Safety section.***



# MANAGEMENT METHODS

## Mechanical

### *General information*

Non-chemical methods are generally suited to smaller, more isolated populations. Great caution must be taken when working in close vicinity of Giant Hogweed, which is often the case when carrying out physical control (see Health and Safety section). Care needs to be taken with the movement and disposal of cut or hand pulled material and any contaminated soil to avoid further spread (see Disposal section).

Except for root cutting, mechanical control does not cause the immediate death of the plants. Death occurs after two to three treatments per year during several growing seasons through depletion of nutrient reserves. Ploughing can control an infestation of tall invasive hogweeds on agricultural land.

Removal of umbels can be as effective as cutting the whole plant, but this control method often fails to prevent seed production due to the high regeneration potential. Plants subjected to removal of flower heads can readily regenerate and produce new flowers and viable seeds of normal size that germinate well. Timing of removal is crucial because if the treatment is applied too early in the season (before full inflorescence), regeneration is very vigorous and an even larger number of seeds is produced. If treatment is too late (at the beginning of seed-setting), there is a risk that seeds will ripen even on cut umbels that are left lying on the ground. The cut umbels must be collected and destroyed. The removal of umbels is most effective if done when terminal umbels just start to flower. Even then, there is some regeneration and treated stands must be checked at the time of seed ripening to prevent release of seeds produced by regeneration. This method should only be considered as an improvised solution for control of stands where no other attempts of control have taken place earlier in the season.

**It is important to clean any equipment used cutting/mowing/digging/ploughing before leaving the site to avoid spreading Giant Hogweed seeds.**



# MANAGEMENT METHODS

## Mechanical (cont)

### *Ploughing*

Where a site is suitable for repeated deep ploughing (up to 24cm), with no species of interest that may be damaged by the process, this can be a highly effective control measure against Giant Hogweed. A plough will both cut the taproot and bury the majority of seed at a depth that will inhibit emergence. The best results are obtained if the established vegetation of invasive hogweed plants is controlled mechanically or chemically prior to the ploughing. The normal time to carry out this method is in the autumn, as frost and freezing temperatures after ploughing at this time of year should help to degrade root stock. Remove large roots from plough zone so that they are not able to regrow.

As ploughing creates a high level of disturbance on sites, it is only suitable for large, non-sensitive sites where other valuable vegetation does not exist. Also, this will most likely be impractical on river banks, where most large stands of Giant Hogweed occur. Ploughing is best carried out before seeding, to reduce the likelihood of spreading the plant, biosecurity of equipment must also be taken into consideration.

### When to manage giant hogweed with ploughing

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec





# MANAGEMENT METHODS

## Manual



### *Digging*

Method: Spade cut 15 – 20 cm below ground, severing tap-root, or digging out top 15cm of tap-root.

This method is best used on young plants, when the soil is moist (for easier digging). Using loppers, cut back the upper portions of larger plants to allow easier access to cut the stem and taproot. Digging about 20cm below ground to remove the growing crown may prevent regrowth and provide good control. Alternatively, make a spade cut at 45 degrees to sever the tap root at approximately 15cm below soil level. Plant taproots may need to be cut up to 25 cm below the soil surface in areas with erosion or on steep inclines, where additional soil may cover the plant base.

Cutting should be done with a sharp blade in the early spring (April-May) before the leaves are too large. Herbicide may also be applied to the cut root that is left in the soil, to prevent any part of the root from growing back.

The aim of this method is to separate the stem base from the root. Cut parts should be removed and left to dry or disposed of in the correct manner (see Disposal section). Check for regrowth during June - July and treat any plants that were missed or have re-sprouted. Whilst root cutting can be effective for a small stand of plants (<200 individuals), the method is labour intensive and needs to be coupled with long term management of the seedbank.

Potential equipment requirements (excluding PPE): Spade or similar tool

Most suitable situation for method: Smaller infestations, or sites that are unsuitable for herbicide application due to organic, water quality, sensitive area constraints. Areas in which there is a grass sward in close proximity, such as areas of dispersed colonisation.

Efficacy: Good, but requires good PPE and working practices. If the sward is fragmented, the site should be reseeded with a grass mix, preferably from local provenance sources.



## Manual (cont)

Constraints: Time-consuming and labour intensive. Requires staff to work in close proximity to Giant Hogweed.

Timescale: March – July

### When to manage Giant Hogweed with digging

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Note on soil excavation: Soil excavation can be an effective immediate control strategy to completely remove plants, and if carried out correctly, also remove the seedbank. Removing the seedbank will require the likely dispersal distance of the seeds from plants to be predicted accurately. Excavation will cause a high level of disturbance, and should only be carried out in non-sensitive areas. Excess soil must be disposed of correctly (see Disposal section). This method has not been widely studied and so the precautionary principle, as well as practicing strict biosecurity, is recommended.

## Manual (cont)

### **Cutting**

Method: Regular strimming, brush-cutting or flailing of stems, prior to seeding.

There are a few different ways of cutting Giant Hogweed. Due to the nature of this plant, please make sure to take appropriate safety precautions when working closely with it, such as wearing full protective clothing (see Health and Safety section). **Cutting must only be done before the plant has started seeding, to prevent further spread.** There are a few different ways of cutting Giant Hogweed, including hand-cutting, mowing and strimming. Flail mowing and strimming may be carried out, but extreme caution is required to avoid the risk of being sprayed with sap, **full protective clothing must be worn.** Cutting plants at or above ground level encourages vigorous regrowth. Plants should be cut every 2 weeks in spring. It is not advisable to attempt cutting plants that are taller than 1.5 m.

One of the most common techniques is flower head removal (only be done before the plant has produced seed, to prevent further spread of the plant). Cutting the head of the plant should be done early in the year when plants are small and have not already set seed. Trials carried out in the Czech Republic found removing all Giant Hogweed flower heads at peak flowering time reduced seed production. Cutting the plants at mid flowering will prevent the production of new seeds, although if cut too early it will stimulate production of secondary stems that can also flower. The removal of flowering heads in early to late summer is a short-term, stopgap method for preventing further seed dispersal (i.e. when it is too late in the season to employ other techniques). It does not kill the plant.

Cutting down the stems regularly with a sharp scythe or sickle before flowering can also help to control this plant. When using a long-handled scythe, pull the blade towards yourself to cut the stem in an upward direction at ground level (note that cutting straight across the stem does not work well). Workers should spread out for safety reasons. Cutting plants at the vegetation



## Manual (cont)

stage will not kill them, rapid regrowth will occur from the base and cutting should be repeated frequently (2 or 3 times or more depending on site conditions) during the growing season.

Giant Hogweed stores its energy in the taproot, which allows the plant to develop. A consistent mowing regime is thought to eventually kill the plant by preventing the leaves from fully developing, and exhausting the energy in the taproot. In some cases, consistent mowing will be needed over a number of years and therefore should only be used where control over a long period is acceptable. Once cut the plant will vigorously regrow, so monitoring of regrowth is needed to provide follow up treatment in a timely manner. Cutting should be repeated regularly for between 5 and 10 years to eradicate the plant. If flower heads are present, remove them prior to mowing. **Never mow if there is seed head, as this will help the plant to disperse.** Do not mow if plants are larger than mower.

Potential equipment requirements (excluding PPE): Strimmer, brushcutter, hook, flail, fork. Vehicle & trailer if not disposing at site

Most suitable situation for method: Sites that are unsuitable for herbicide application due to organic, water quality, sensitive area constraints. Areas in which there is a grass sward in close proximity, such as areas of dispersed Giant Hogweed colonisation

Efficacy: Moderate, but requires good PPE and working practices. After treatment, the site should be reseeded with a grass mix, preferably from local provenance sources.

Constraints: Requires good access and appropriate methods for waste management.

### When to manage Giant Hogweed with digging

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	



## Chemical



**NOTE: Chemical control of Giant Hogweed requires herbicides . Personnel must be trained and certified. Contractors must have the appropriate National Proficiency Tests Council (NPTC) certification and must follow instructions and wear appropriate protective equipment. Only certain herbicides may be used near water, and approval is required from The Environment Agency before using these. Other permissions and health and safety requirements may need to be considered. For more information, please see the “Health and Safety” and “Legislation” sections.**

Chemical control can be controversial (for example when used on public land) and expensive. Working in partnership with neighbouring landowners and local groups, as well as raising awareness about what you’re doing and why is critical when using chemical control on such a site.

The Tweed Forum carried out an extensive Giant Hogweed control project at a catchment scale and advised that readiness for spraying could be defined as having large (>50cm length) leaves and/or signs of flower stem development. They also reported that there is a misconception that Roundup (in which glyphosate is an active substance) doesn’t work, as people had treated every plant they could find in early March and seen them apparently die only to have more (different) plants grow in the same area a month or two later. It is crucial to wait until at least mid-April to start control work to allow later sprouting plants (Giant Hogweed has staggered sprouting times) time to emerge, otherwise control work will need to be repeated. As a rough guide, the majority of Giant Hogweed plants will be visible between the last two weeks in April and the first two weeks in May, with site specific conditions such as aspect, soils and/or altitude capable of moving this treatment window.

The optimum application timing is before flowering, ensuring that all foliage is well covered. In mixed stands, use a weed wipe when plants are about 1m tall between March and May. If necessary, spraying can continue throughout the summer. Follow up treatments are often needed.



## Chemical (cont)

While timing is very important to the efficient operation of the control programme, it is also important to realise that for effective control many heavily infested sites had to be treated at least twice a year for the first two control seasons. This is due to the staggered germination of Giant Hogweed seedlings and also to cover the possibility of missing a few plants during the first treatment. When plants are more than 1.5m tall, proceed with extreme caution. Repeat chemical treatment may be required for up to 10 years. It is recommended to monitor sites annually and re-treat as necessary to take account of newly emerged seedlings.

The only herbicide recommended to use for the control of Giant Hogweed in England is glyphosate. This is also the only active herbicidal ingredient allowed to be used near any water body in the England, including rivers, streams lakes and ponds. Glyphosate is the active ingredient in products such as 'Roundup biactive' and 'Glyphos biactive'. Glyphosate is a translocated herbicide, which means the plant carries the herbicide down to its roots. Many formulations are suitable for use in or near water; the product is deactivated by micro-organisms in soil, doesn't leach and possesses low toxicity to animals. The biactive formulations of glyphosate are generally regarded as the most suitable. Efficacy of glyphosate is greatly increased with use of the adjuvant Codacide Oil (@ 1 l/ha per glyphosate @ 6 l/ha in 400 litres of water).

### ***Spraying***

Method: Glyphosate @ 6 l/ha treatment of young (preferably < 1m) growth, either by weedwipe or knapsack sprayer.

Glyphosate is sprayed onto the foliage of Giant Hogweed. Beware of drift on to non-target plants and lawns. Select the appropriate nozzle (deflector or even flat fan) and pressure (1 bar). If the risk to other plants is high, use a weed wiper to apply the herbicide instead of a spray. Note that weed wipers are labour intensive. Do not apply herbicide if rain is imminent or if it is windy. The treatment also needs time to get into the plants; therefore, select a day when the weather is likely to be dry for at least 6 hours after treatment.



## Chemical (cont)

Spraying both top and underside of leaves improves control. Long-lance sprayers may assist in accurate application of glyphosate to plants growing in inaccessible sites along river banks.

Potential equipment requirements (excluding PPE): Knapsack sprayer or weed wiper

Most suitable situation for method: Large dense infestations, during the initial stages of long-term treatment. Encouraging good sward growth is an important part of GH seedling suppression and reducing erosion, so this method is usually replaced by control methods with less non-target damage

Efficacy: Good, but non-target damage to grass sward encourages further germination. After treatment, the site should be reseeded with a grass mix, preferably from local provenance sources

Constraints: requires AqHerb01 approval and NPTC PA1 & PA6 qualifications. Potential non-target damage, which will reduce the ability of the sward to resist reseeding

Timescale: April – June. Initial treatment should be carried out in the spring and followed up with spot treatments where necessary later in the season (which can carry on through to mid-October). It is best to treat with herbicide spray in dry and calm weather. Note that control symptoms may take one to two weeks to appear.

### When to manage Giant Hogweed with spraying

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



## Chemical (cont)

### **Stem injection**

Method: 10 to 1 solution of glyphosate and water, injected below the first node after cutting stem or into them stem using stem-injection applicators.

Potential equipment requirements (excluding PPE): Adapted backpack sprayer or stem injection equipment

Most suitable situation for method: Areas where non-target damage to the surrounding sward, sensitive areas or water quality needs to be avoided

Efficacy: Good, but non-target damage to grass sward encourages further germination. After treatment, the site should be reseeded with a grass mix, preferably from local provenance sources

Constraints: requires WQM1 approval and NPTC PA1 & PA6 qualifications. Potential non-target damage, which will reduce the ability of the sward to resist reseeding

Timescale: June - September

### When to manage Giant Hogweed with stem injection

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec





## Biocontrol

### *Natural enemies*

Some research has been carried out in the past, searching for suitable biocontrol species. CABI states that further study of potential biocontrol agents is required to clarify whether or not there is some chance of their successful use in control. This view is supported by other studies as well (see reference list). So far, no insect, fungus or disease has been found that is specific enough to target hogweed alone.

For more information please see: <https://www.cabi.org/isc/datasheet/26911>

### *Grazing*

Intensive grazing by cattle, sheep, pigs or goats throughout the growing season will suppress the growth of Giant Hogweed, but is generally not thought to completely eradicate it. However, it can be very useful in conjunction with other methods. Note that horses are not thought to be effective grazers of Giant Hogweed. Grazing has similar effects to mowing, with repeated new growth from damaged plants. Akin to mowing, this control strategy often will take a number of years to ensure complete eradication, but is effective at depleting energy stores in the roots of Giant Hogweed.

There is some debate as to whether animals are susceptible to the toxic effects of Giant Hogweed. It has been reported that particularly those with bare and un-pigmented skin seem to be affected. Always err on the side of caution and consider animal welfare with this method, selecting animals with skin pigmentation (such as black faced sheep) and fur can reduce inflammation of mucous secreting membranes. Symptoms of poisoning are skin inflammation, and blistering around the mouth, nostril, eyes and ears and genitals. Remove affected animals from the area temporarily. The effects are transitory and the animals show no long-term side effects. Anecdotally it has been suggested that meat or milk used from animals grazing Giant Hogweed cannot be used because of changes in taste. The livestock will require daily inspection and access to water and additional supplements of nutrients (e.g. minerals) may be



## Biocontrol (cont)

necessary. Inspections of fences should be conducted periodically in order to maintain them. Public safety must also be taken into account when considering this method.

Method: The grazing pressure is adjusted according to the density of the stand and the growing season. It is recommended to use a dense regime of animals in spring (20-30 sheep/ha), and reduce grazing pressure at the end of June (5-10 sheep/ha) when the plant is weakened and most of the plant biomass has been removed. Grazing is a cheap method when large fenced areas can be established but should also be considered for smaller stands if neighbouring areas are grazed and livestock can be relatively easily transferred for shorter periods. If possible, the fenced area should not only include the colony of tall invasive species of hogweed but also the surrounding area where seed dispersal may have taken place. Over time, grazing promotes a dense sward of grazing-tolerant species and limits the amount of suitable ground in which hogweed seeds can germinate and become established (Nielsen et al., 2007).

Timing: Grazing should begin in mid-March and continue through the growing season. Growth is suppressed but rotational grazing does not kill the plants. It is thought that pigs may eradicate the plant through root damage.

### When to manage Giant Hogweed with grazing

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

## Disposal

The three most common methods of disposing of Giant Hogweed and associated contaminated materials/soil are: burial on the site of control, incineration or disposal to a licensed landfill site.

Ideally material is left on site, as this reduces the chance of the plant spreading. Ideally cut/pulled/sprayed plants should be left on site, but is crucial to prevent them from re-growing or producing seed.

When carrying out mechanical control, root sections should be left to dry out in a secure location exposed to direct sunlight for two weeks to ensure the root sections are dead.

If you have a large amount of waste plants, they can be left in piles to compost if they are securely covered with a tarpaulin to prevent re-growth. Subject to approval by The Environment Agency an option is to bury soil and plant material; contact the agency for advice on this. **Cut flower heads must not be left on the ground, as it thought that they can still produce seed in this state.**

If they have set seed, or you do not have access to a membrane for composting or the depth for required for burial, Giant Hogweed can be burnt on site, to do this you are likely to require a waste exemption from The Environment Agency.

Under current legislation (see Legislation section), any plant material of Giant Hogweed and any soil contaminated with it, is classed as controlled waste. If you cannot dispose of the plants on site and they need to be transported off site, the material is to be treated as hazardous waste and can only go to licensed waste disposal stations (which are limited and will likely charge).



## Disposal (cont)

### ***After Disposal***

Check treated plants for regrowth and continue to monitor the area for regeneration of seedlings in the vicinity of the original infestation, especially along watercourses. Re-evaluation should be carried out in the context of informing a control programme for the next year. The effectiveness of the control programme is measured by mapping the abundance of flowering (and therefore seeding) of Giant Hogweed before treatment begins and the subsequent years of control work. Monitor for the presence of plants during the late spring and summer.

There is some debate on how long Giant Hogweed seeds remain viable in the soil, initially it was thought to be as long as 10 years, but newer research suggests a far shorter lifespan, either way it is best to use caution when deciding the length of monitoring. Due to Giant Hogweed's potential to reappear after control attempts, sites known to have contained Giant Hogweed populations should be monitored for several years following treatment. If regrowth does occur, treatment will have to be repeated.

Additionally, consider the topography of your site for monitoring, seeds will spread more readily downslope. Infestations along watercourses present a potential for widespread distribution of Giant Hogweed seeds. Moving water easily picks up seeds and can transport them large distances. As such, stream banks downstream from Giant Hogweed infestations are especially at risk. Streamside vegetation should be monitored as far as possible for areas downstream from a known infestation. It is recommended to monitor areas within a 60 metre radius of identified infestations. On flat land, Giant Hogweed seeds tend not to spread far, so a smaller area (8 metre radius) should be adequate, as seeds will spread more readily downslope. Infestations along watercourses present a potential for widespread distribution of Giant Hogweed seeds.



## Disposal (cont)

Successful removal of Giant Hogweed plants may leave behind bare ground prone to erosion and non-native species invasion. A good strategy for preventing re-establishment is to create and/or maintain vegetation cover. Bare soil should be sown or planted with native vegetation, preferably sourced on site. Dense grass sward tends to discourage Giant Hogweed seed germination. If Giant Hogweed plants do establish, prevent seed spread by controlling the plants before the flowering stage. Planting trees and shrubs is good as afforestation of the area serves to prevent invasion, as their shading effects should help to inhibit establishment of Giant Hogweed. Both trees and shrubs appear to be suitable for this kind of management. The saplings planted should be of a size to ensure the rapid establishment and development of a closed canopy.

Note that chemicals that are persistent in the soil from chemical control may delay the planting of replacement species.



# Ineffective or unavailable control

## ***Chemical***

No other herbicides are recommended due to the effects they have on the surrounding environment and new legislation reflects this, making it very difficult to use other chemicals.

## ***Mechanical/Manual***

### **Saline treatments**

It is thought that Giant Hogweed has too much tolerance for saline conditions for this to be an effective method, as this species has been found growing in estuaries.

### **Hand-pulling**

Hand-pulling of young plants is a method that has been employed in the past, but is not recommended as it is labour and time intensive, risky in terms of health and safety and it is easy to accidentally leave part of the plant in the ground, which could result in regeneration.

### **Cutting seed heads**

In the past, this method has been utilised (cutting seed heads into bags and disposing of them) but as this must only be done with extreme care, due to the high likelihood of spreading the plant, so it is not recommended.

### **Other**

The following methods have not either not been tested in depth, or under study conditions, have been shown to be ineffective at controlling Giant Hogweed:

- \* Covering with membranes such as black plastic after cutting
- \* Heat treatment and heating oil
- \* Household ammonia
- \* Cryotechnology, such as liquid nitrogen
- \* Cutting immediately before or after spraying
- \* Manually crushing plants



## Preventing spread

Once escaped in the wild, dispersal of Giant Hogweed can result from a variety of management and recreational activities. For example, their prolific seeds that can easily become attached to clothing, fur of pets and muddy boots. As this species is difficult to eradicate, raising awareness and practising good biosecurity is key to effective management and preventing further spread. For guidance on this, please follow the Check, Clean, Dry guidance in the link below:

<http://www.nonnativespecies.org/checkcleandry/index.cfm>

In order to manage Giant Hogweed successfully at a landscape level, conducting outreach to private landowners and the broader community, as well as recruiting volunteers, is important. Educating people in your community about what Giant Hogweed looks like, the health implications and the devastating effects that it can have on our environment will help to increase reports of new infestations, which are easier to manage when they first occur.

If possible, (particularly if it is a publically used site), it is best to cordon off the infested area and put up a restricted access sign explaining about Giant Hogweed, to avoid dispersing the plant and to stop people being exposed to it. Ideally, a management plan can be developed and tailored for the site and key person made responsible for the plan. If possible restrict vehicular access to the site.



## Legislation

Under the EU Invasive Alien Species Regulation, as well as Section 14 (2) of the Wildlife and Countryside Act 1981 (as amended) and Article 15 (2) of the Wildlife (Northern Ireland) Order 1985, it is an offence to plant Giant Hogweed, or otherwise cause it to grow, in the wild. Giant Hogweed is a Species of Union Concern and in accordance with the EU Invasive Alien Species Regulation ie Regulation EU No 1143/2014, it is also an offence to import into the EU, keep, grow or cultivate, transport (to, from or within the EU; except to facilitate eradication), place on the market, use or exchange this species - unless there are specific exemptions or permits.

There is no obligation to eradicate this species from land or to report its presence to anyone. However, if this species spreads to the wild or to a neighbour's property then landowners/managers could be liable. A species such as Giant Hogweed *Heracleum mantegazzianum* would be considered a statutory nuisance where the plant is growing along pathways or on land which is easily accessible to users or passers-by. Also it can be the subject of Community Protection Notices where occupiers of Giant Hogweed infested ground can be required to remove the weed or face penalties. Local Authorities and/or the Police have powers under certain circumstances to require Giant Hogweed to be removed.

Furthermore, Giant Hogweed is also covered by the Environmental Protection Act 1990. Under this legislation, any plant material of this species, and any soil contaminated with them, is classed as controlled waste.

Some advice on river-edge (riparian) species and waste issues associated with Giant Hogweed and Japanese knotweed can also be obtained from the Government website that provides advice on environmental legislation ([www.netregs.gov.uk](http://www.netregs.gov.uk)).

Links to other resources on legislation of INNS:

<https://www.property-care.org/wp-content/uploads/2015/04/Guidance-Note-on-Legislation-for-Invasive-Non-native-Plant-Species-v5.pdf>

<http://www.nonnativespecies.org/index.cfm?sectionid=23>





## Health and Safety

**Giant Hogweed can be a very dangerous plant and appropriate PPE (personal protective equipment) must be used at all times.** The chemicals in Giant Hogweed have evolved as a defense against predators; these are called “furanocoumarins” and are found mainly in the sap. **All parts of Giant Hogweed, including the hairs on stems and leaves which can penetrate light fabric, contain this toxic sap, which can cause severe skin blistering.** Furanocoumarins are at their highest concentration in the seeds. In addition, several furanocoumarins have been reported to be carcinogenic (i.e. they cause cancer) and teratogenic (i.e. they cause malformations in the growing embryo). The habitats Giant Hogweed tends to grow in often have high nutrient levels, which increases the toxicity of the plant. Types of habitat include unshaded habitats with high soil nitrate levels (for example, riverbanks, roadsides and waste ground).

The sap reacts with the skin and makes the skin sensitive to ultra-violet light, though no pain or irritation is felt at the time of contact. Any subsequent exposure to sunlight can cause the skin to burn and will result in large, watery blisters that may not become evident until 15 to 48 hours following contact, by which time the damage has been done. Although some accounts suggest that effects can be felt as quickly as 15 minutes after exposure. Due to the fact that contact with the plant itself is completely painless, workers and children in contact with the plant can continue with their action often for hours, which results in greater exposure and often more severe side effects.

Blisters may develop into purplish or blackened scars and could persist as recurrent photo-dermatitis long after exposure. Heat and moisture (sweat or dew) can enhance the skin reaction. **Contact with the eyes can lead to temporary, or in some cases permanent, blindness.**

Contact with sap can occur by brushing against any broken plant parts, handling plant material, or even by touching tools or mowing equipment that was used for Giant Hogweed control. To protect oneself, protective water-resistant clothing and protective glasses or goggles must be worn when



## Health and Safety (cont)

working with Giant Hogweed. Long sleeves, long waterproof gloves, boot etc. are highly recommended. Synthetic water-resistant materials are best (e.g. dishwashing gloves, rain suit or tyvek suit, and rubber boots), since cotton and linen fibres can soak up the plant sap and be penetrated by plant hairs. Machine operators should take similar precautions as the sap can be spread onto machinery and subsequently come into contact with skin. Cut material can remain active for many hours.

### Safety Precautions:

- ◆ Do not touch the plant with bare skin- toxicity can result from any action that involves bruising, cutting or touching the foliage, stem, flower or fruit.
  - \* Apply sun block before working near Giant Hogweed plants to prevent ultra-violet light from reaching the skin if sap does get on you.
  - \* Keep water, soap and eye-wash near work area in case of exposure to sap.
  - \* Do not touch your exposed skin with the sap covered gloves!
  - \* Wearing a face shield will help to keep you from touching your face with sap covered gloves and also from inhalation
  - \* If controlling plants with multiple people, keep a good distance from one another as the sap can splash more than a metre while doing control.
  - \* Wash equipment thoroughly with water immediately after use.
  - \* Wash skin with soap and water after control work.
  - \* Limit exposure to sunlight after control.
  - \* Change out of work clothes and launder clothing (separately) that may have contacted plants.
  - \* At small sites, some people have chosen to work around Giant Hogweed plants after sunset to limit their exposure to sunlight.
  - \* Do not use a "weed-whacker" or brush cutter – sap may splatter on you as stems are cut



## Health and Safety (cont)

**If you are exposed to Giant Hogweed sap:** If an individual does come into contact with the sap of a Giant Hogweed plant, the area should be immediately washed with cool, soapy water. In order to minimize phytophotodermatitis, the affected area should be covered and exposure to ultraviolet light should be avoided for 48 hours following contact. Treatment with topical steroids early in the reaction can reduce the severity and ease discomfort. In the following months, a sun-cream should be used for the sensitive areas. If sap goes into the eyes, rinse them with water or eye wash for at least one minute and use sunglasses. **Do not hesitate to seek medical advice, particularly after intensive contact or if darkening of the skin occurs.**

### Health and Safety Guidance for Use of Glyphosate

Use of glyphosate requires AqHerb01 approval and NPTC PA1 & PA6 qualifications.

[Application to use herbicides in or near water](#)

[City & Guilds Level 2 Principles of Safe Handling and Application of Pesticides \(PA1\)](#)

[City & Guilds Level 2 Award in the Safe Application of Pesticides using Pedestrian Hand Held Equipment](#)

[Health and Safety Executive Code of Practice for Plant Protection Products](#)

Useful resources and guidance on health and safety when planning a project working with invasive species is available on the GBNNSS website:

<http://www.nonnativespecies.org/index.cfm?pageid=266>



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Reducing and Preventing  
Invasive Alien Species Dispersal

## Where To Go For More Information

[www.cabi.org](http://www.cabi.org)

<https://www.fisheriesireland.ie/Projects/caise.html>

<https://invasivespeciesireland.com/species-accounts/established/terrestrial/giant-hogweed>

<https://beta.gov.wales/giant-hogweed-controlling-it-your-land>

<https://www.pitchcare.com/shop/iguide/giant-hogweed>

<https://www.property-care.org/wp-content/uploads/2014/12/Guidance-Note-Giant-Hogweed.pdf>

## RAPID

RAPID is a three year EU funded LIFE project led by the Animal and Plant Health Agency (APHA), with Natural England and Bristol Zoological Society as key partners that piloting innovative approaches to Invasive Alien Species (IAS) management in freshwater aquatic, riparian and coastal environments across England. The project is supported by a number of further Technical Partners.

<http://www.nonnativespecies.org/rapid>



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