

## Sheep Grazing as a Management Tool to Control Giant Hogweed

Giant hogweed (*Heracleum mantegazzianum*) is a non-native invasive plant that has become widely distributed in the UK. It is especially abundant along watercourses but is also commonly found in rough pastures and wasteland.

**WARNING – Giant hogweed sap is phytotoxic. It causes human skin to become sensitive to UV light, leading to severe burns and blisters on exposure to sunlight. Affected skin can be sensitive for years.**

### Overview of Giant Hogweed

**Description:** Giant hogweed is an umbellifer (member of the cow-parsley family) with long flowering stems, typically 2-3m in height. The umbrella-shaped flowers are large (up to 80cm across) with white or pinkish flowers. It has jagged leaves with serrated edges and the stems have sharp bristles and purple blotches.

**Life cycle:** Giant hogweed typically matures after 2-3 years, when it then flowers and sets seed – the plant normally dies after flowering. It has long branching taproots which store energy and enable re-growth following grazing or cutting until the energy is depleted. Flowering may be delayed or prevented by repeated grazing.



Seedlings with varied leaf morphology



Sharp bristles and purple blotches on immature plant stem



Jagged, lobed leaves up to 3m long



Flowering plants can be up to 5m tall with white / pinkish flowers

**Impacts:** Giant hogweed grows in dense, impenetrable stands, outcompeting native plants and reducing species diversity. It can cause riverbank erosion. Human health risks complicate eradication efforts – care must be taken when carrying out control work. Typical control methods include herbicide application and cutting of flowering heads.

*Giant hogweed is listed under Schedule 9 (established non-native species) of the [Wildlife and Countryside Act](#) as amended by the [Wildlife and Natural Environment \(Scotland\) Act 2011](#). It is an offence to plant or otherwise cause to grow it in the wild outwith its native range.*

## Sheep Grazing Trials

Between 2013 and 2022, sheep grazing as a method to control giant hogweed has been trialled at two sites in North-East Scotland. The Scottish Invasive Species Initiative has run a trial at Macduff from 2019 to 2022. This work has been informed by earlier trials at Auldtown which began in 2013.

### Macduff Grazing Trials (2019 - 2022):

- The trial site is a 1km (7 hectare) stretch of woodland along the River Deveron.
- Scottish Greyface and Blackface sheep have mostly been used. Wethers (non-breeding males) were used as this was the land managers' preference for ease of management of the flock.
- In 2019, 25 sheep were put on the site from April to November. This led to overgrazing and numbers were reduced in later years. In 2022, only 11 sheep were put on the site from May to September. Full details on grazing pressure adjustments are detailed in the table below.

Grazing Pressure Adjustments in the Macduff Sheep Grazing Trials						
Year	No. of sheep	Sheep per Hectare	Grazing Days	Livestock Units (LU)	Stocking Density (LU/Ha)	Grazing Pressure (LU/ha/year)
2019	25	3.6	5075	3.75	0.54	0.3
2020	23 -> 12	3.3 – 1.7	2476	3.6	0.51	0.19
2021	12	1.7	1326	1.8	0.26	0.08
2022	11	1.6	1276	1.65	0.24	0.07

### Key findings:

- Sheep have been highly effective controlling giant hogweed, tackling the majority of seedlings, immature plants and large mature plants.
- Initial overgrazing increased the presence of unpalatable species (nettles, bracken and thistles), poaching of the ground, loss of herb species and grazing of shrubs and tree seedlings.
- Low grazing intensity by sheep should be used initially. Grazing pressure can be adjusted - informed by observations of giant hogweed abundance and changes in vegetation and bare ground.
- The sheep may require a familiarization period before grazing giant hogweed. However, they soon develop a preference for it which is retained across grazing years.

Results from these and previous trials can be found [here](#) and inform this management guidance.



**June 2019 (Year 1):** Dense stands of hogweed visible at monitoring point



**October 2019 (Year 1):** Hogweed growth reduced but site overgrazed



**June 2020 (Year 2):** Seedlings have grown but no large plants are present

## Management Considerations

### What sheep to use?

Blackface and Greyface sheep have mostly been used in these trials. The dark skin pigmentation of Blackface sheep may help resist the photosensitivity impacts of giant hogweed sap. During the trials there was no evidence of adverse effects on the sheep from their giant hogweed diet. The sheep were inspected regularly by the land manager and in early trials they were examined by a vet at least twice a year. Wethers were used as these could be moved wherever and whenever needed to combat giant hogweed.

### How many sheep?

Aim to use the lowest grazing pressure needed to control giant hogweed as this reduces the risk of overgrazing. In our Macduff trial, an initial annual grazing pressure in 2019 of 0.3 LU/ha/year led to overgrazing and was progressively reduced to 0.19 LU/ha/year in 2020, 0.08 LU/ha/year in 2021 and 0.07 LU/ha/year in 2022. The reduced grazing pressure in 2021 and 2022 maintained giant hogweed control and removed overgrazing. Whilst we cannot advise a single grazing pressure for all sites (sites will vary depending on terrain, alternative forage and many other factors) we recommend applying a low grazing pressure initially, observing impact on giant hogweed present and adjusting numbers accordingly.



Once familiar with the plant, sheep selectively graze giant hogweed



Hogweed leaves eaten by sheep



Sheep reaching up to graze hogweed

### When to Graze?

Avoid grazing over winter and early in the year - this is more likely to lead to poaching and grazing of non-target vegetation. Introducing sheep in early May and removing them in mid-August worked well in trials. Giant hogweed seedlings present in May were grazed by the sheep when introduced and new and larger plants were tackled over the grazing period as they emerged or grew. Removal of sheep for brief periods (e.g. for inspection or medication) is fine as they return to grazing when back on site.

### Rotational Grazing

Permanent or temporary fencing can be used to move sheep between different areas within and between sites with giant hogweed. This can help to target grazing efforts to priority locations and prevent overgrazing of others.

## Site Considerations

Water provision, shelter, access and stock management should be considered prior to implementing sheep grazing. Sheep may behave differently in different sites depending on factors such as flock size, available forage, site aspect and levels of disturbance. There will be different considerations in a wooded versus an open areas and if grazing along a riverbank you should ensure that significant erosion or poaching does not occur to comply with [The Water Environment \(Controlled Activities\) \(Scotland\) Regulations 2011](#).

## Impacts of Overgrazing

High sheep numbers will control giant hogweed but are more likely to result in overgrazing, causing:

- increased dominance of undesirable, highly defended and less palatable plant species (nettles, thistles, etc.)
- changes in vegetation composition including loss of herb species, grasses, shrubs, tree seedlings and saplings
- poaching of the ground - which could in turn promote giant hogweed seedling emergence

Increased dominance of highly defended species could also make giant hogweed more difficult to control if the plants become less accessible – sheep will be reluctant to enter thickets of bracken, nettles and thistles to graze the hogweed. Impacts of overgrazing and changes to vegetation composition could remain for a number of years, even after the overgrazing has stopped.



Poaching of the ground in a giant hogweed monitoring plot



A carpet of hogweed seedlings and no mature plants – a sign of progress



Extensive area covered by hogweed seedlings at the grazing trial site

## Monitoring Progress

It is important to monitor for overgrazing and progress of giant hogweed control. Visit the site regularly to look for signs of overgrazing and adjust sheep numbers if needs be. To assess progress with giant hogweed control, consider the site on an annual and long-term basis - Is giant hogweed abundance decreasing overall? Are there fewer mature (flowering) plants present? These are promising signs.

## Giant Hogweed Management

In well-established infestation sites giant hogweed control is a long-term strategy as the seedbank can survive for up to ten years. The sheep may not remove all plants (particularly those in difficult terrain or boggy ground) and it is essential to annually cut and remove flowering heads. This must be done before

the plants set seed (in August) to prevent replenishment of the seed bank. We suggest flower head removal is best undertaken in July – when heads are visible and before seeds have set. Flowering heads should be cut safely using protective equipment and long-handled saws, taking care to avoid contact with the sap. Flowering heads can be removed or composted on site.



Flower heads must be cut before seeding in July/August



Stems can be cut carefully with a long-handled saw



A single plant produces 20 - 50,000 seeds which can be viable for up to 10 years

If the flowering head is starting to develop seeds, extra care must be taken to ensure seeds are not spread. A cotton bag or sack should be tied over the flowering head prior to cutting the stem. These bags containing the flower/seed head can then be burnt. However, it is best to avoid this and ensure flowering stems are cut before seeds develop.

### Benefits and Considerations of Sheep Grazing as a Control Method

Benefits	Considerations
Reduced time commitment to manage giant hogweed compared to that required to undertake annual chemical control	Time investment to manage the sheep - monitoring for overgrazing, monitoring progress with giant hogweed control, general oversight, possibly grazing rotation
Expand area of productive grazing land available for land manager	Physical management of the site – fencing, water provision etc.
Avoids the need for annual contractor costs* to deliver chemical control	Risk of overgrazing – resulting in poaching and changes in vegetation composition.

\*Contractor costs ~£200 per day. We estimate that control by contractors at the Macduff trial site would initially have cost ~£2000 – £2500 per year. After initial control costs would have reduced to ~£1200 – £1600 annually.

## Key Tips for Success

- Low grazing intensity over several years is likely to be most effective to control giant hogweed.
- Start with a low grazing intensity and assess the impact of grazing annually.
- Avoid winter and early year grazing to reduce the risk of overgrazing.
- Some giant hogweed plants may escape grazing and survive to flower - it is essential that flowering plants are cut before they seed each year. Do this in July.
- Control of giant hogweed by sheep grazing is a long-term strategy. Seeds can last for many years - persistence is key!



Sheep will graze on both seedlings and mature giant hogweed plants. When grazing larger plants, they can knock over tall stems to graze the leaves. They will graze at night and during the day.

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Further information on the project is available at – [www.invasivespecies.scot](http://www.invasivespecies.scot)  
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