

Grassland restoration & creation... for bumblebees



Factsheet 3
Land management
series

The loss of over 97% of the UK's wildflower-rich grasslands has, unsurprisingly, had a huge impact on bumblebees, which have seen simultaneous dramatic declines. Even with good management, many grasslands have lost their wildflower seed bank so seed introduction is needed to bring the flowers back.

Key facts:

Funding available: England, Wales,
and Scotland

Sustainability: Long-term option

Restoration time: Late summer

Suitable for: Permanent grassland

Upkeep: Annual mowing and grazing

Habitat quality: Very high

Why restore a wildflower meadow?

Wildflower meadows are the most important habitat for bumblebees as they provide flowers throughout the summer and contain many nectar- and pollen-rich plant species favoured by bumblebees.

Plants such as red clover, yellow rattle, bird's-foot-trefoil and red bartsia are great pollen sources for queen and worker bumblebees, whilst knapweed and scabious are important nectar sources.

Why conserve bumblebees?

Almost all of the UK's 20+ species of bumblebee are thought to have declined in range or abundance. Bumblebees are hard-working and versatile pollinators and hence provide an important service to agriculture. They are also key in maintaining our biodiversity, as so many wild plants depend upon them for pollination.

How grassland restoration can work on your farm...

- supports pollination
- increases crop yields
- supported by agri-environment payments
- has diversification benefits eg. tourism
- reduces outlay eg. no fertiliser costs
- provides mineral- and nutrient-rich grazing and hay



Wildflower meadows contain up to 40 plants per square-metre, many of which provide pollen and nectar for foraging bumblebees and other wildlife

Grassland restoration and creation

Grassland restoration can sometimes simply be a case of getting the management right (please see Land Management Factsheets 1 and 2). Establishing a sustainable grazing regime to control scrub or prevent poaching can help restore a flower-rich sward. Likewise, if there is a nearby flower-rich site, or a flower-rich seed bank, implementing good management could provide the opportunity for more flowers to establish.

Unfortunately, in many cases the seed bank is impoverished and sites too fragmented for diversity to be restored through management alone. In these cases it is necessary to give nature a 'helping hand' by introducing seed of appropriate species.



For more information on bumblebees please visit

www.bumblebeeconservation.org

Grassland restoration - one step at a time...

Grassland restoration is not a quick process. Unfortunately, whilst it may take only an application of fertiliser to destroy one, the few most-valuable flower-rich grasslands that we have remaining in the UK will have taken decades to develop such a diverse sward. However, there is a lot that can be done to quickly increase the value of a grassland for bumblebees and other biodiversity, which in time could go some way to replacing the precious grasslands that have been lost.

Seed addition site selection

Not all sites are suitable for seed addition in the first instance. Soils must be relatively unimproved (soil phosphate < index 2) and sensitive management should already be in place (see Land Management factsheets 1 and 3). The species composition of the current sward is also very important. In some cases several years of careful management will be needed to bring weeds of fast-growing grasses under control to provide good conditions for meadow flowers to establish.

Adding value for bumblebees to existing grasslands

Meadow type	Improved	Semi-improved	Semi-improved	Unimproved
Habitat value	Species-poor	Moderately species-rich	Species-rich	High-value species-rich
Species per sq m	1-9	9-15	15-20	20+
Implement sensitive management regime	✓	✓	✓	✓
Consider taking additional hay cut in September to help deplete nutrients	✓			
Implement a break in application of farmyard manure to help deplete nutrients and aid establishment of yellow rattle	✓	✓		
Add seed of key species such as yellow rattle, red clover, sweet vernal grass, meadow buttercup		✓		
Add seed of less common species missing from the sward such as great burnet, bugle or knapweed			✓	

Restoring species-poor grassland to moderately flower-rich grassland

This may take a bit of time but is vital to start providing long-term habitats for bumblebees. Switching to a less intensive management regime, including cessation of use of chemical fertilisers, will allow a more flower-rich sward to develop over time. Where a field has been receiving high or regular applications of chemical fertiliser, it is likely that the soil fertility will be high, and this will take time to deplete. Fertile soils do not

support flower-rich swards as fast-growing grasses and weeds take advantage of the nutrients and grow quickly, at the expense of slower-growing grassland flowers.

Ceasing muck application and making hay once or twice a year in late summer will reduce fertility over time, providing better conditions for flowers to establish.

Restoring moderately species-rich grassland to species-rich grassland

Once a field has been in favourable management for some time and soil fertility has reduced (to soil phosphate index 0 or 1), it may be necessary to introduce seed of key species like yellow rattle, sweet vernal grass, red clover and meadow buttercup if there is no seed source nearby. These species have been identified as playing a key role in the development of a flower-rich sward, as they interact with soil fungi and provide better conditions for other flower species to establish.

Enhancing species-rich grassland to high value species-rich grassland

Once plants like yellow rattle have established and sensitive management has been in place for a few years it may be necessary to introduce some of the other characteristic grassland species, if there is no seed source nearby.

← Yellow rattle *Rhinanthus minor*

This pollen-rich, hemi-parasitic plant suppresses fast-growing grasses, creating better conditions for other flowers to establish.



Please contact your local Bumblebee Conservation Officer for advice on the best options for your land : Phone: 01786 467818 Email: enquiries@bumblebeeconservation.org

If you are in an agri-environment scheme you must also discuss any changes in management with your Natural England adviser

Sourcing seed for grassland restoration or creation

It is vital when restoring or creating a grassland in the countryside that only seed of British native origin and local provenance is used, and that the species introduced are appropriate to the site. Otherwise you could risk introducing invasive species or variants as well as jeopardising genetic biodiversity and the local distinctiveness of habitats in your area.

There are a several ways to source seed for use in grassland restoration and creation...

Purchase seed mix

A few seed merchants may be able to supply you with locally-provenanced seed mixes, harvested from flower-rich grasslands. Firms to try: Scotia seeds, Emorsgate, Herbiseed, or Charles Flowers. Steer clear of seed merchants selling 'meadow mixes' that contain agricultural variants and non-meadow species such as poppies.

Harvest seed from flower-rich sites

The best way to be sure of where seed has come from is to harvest it from a local site. When seed is harvested from a flower-rich site it is vital that seed is harvested rotationally and from a small proportion of the field and to protect the valuable seed bank. We can provide more advice on this.

Seed harvesting methods:

Brush-harvester This machine is generally side-mounted and uses a PTO driven spindle with brushes to remove and collect seeds from a standing grass sward. ATV-trailed versions are also available. This method requires dry weather and can produce a relatively grassy seed mix, as lower-growing flower seed-heads are not harvested.

Vacuum harvester A hand-held 'leaf vacuum' is used to harvest seed from a standing sward. This is a simple and effective method for collecting seed on a small scale. Most suited to dry conditions.

Green hay Traditional hay-making machinery or a flail mower-collector is used to cut and immediately harvest an area of flower-rich grass. The 'green hay' is quickly transported to the restoration/creation site, where it is spread across the ground. Seeds then fall as the hay dries, introducing a wide variety of flowers and grasses. This is the most effective method for harvesting seed on a large scale. Can be used in damp conditions.



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Funding (England):



Higher Level stewardship

HK7 Restoration of species-rich, semi-natural grassland £200 per ha

This is the best option for restoring flower-rich grasslands through management and/or seed addition.

HK8 Creation of species-rich, semi-natural grassland £280 per ha

This is the best option for creating flower-rich meadows and can be used on improved grassland and ex-arable sites.

GS Native seed mix capital item 100% of costs

This capital item covers the costs of seed and/or contractor time to harvest and spread local seed or green hay.

If the restoration or creation is being undertaken with agri-environment funding then you will need to meet with Natural England's guidelines on seed provenance and provide evidence of seed sources.

Seed spreading

Purchased, brush-harvested or vacuumed seed can be broadcast mechanically or by hand. Green hay can be spread using a muckspreader. Seed should generally be sown/spread in late summer-early autumn.



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Ground preparation

On restoration sites, the ground should be prepared by cutting or grazing the site at the end of the summer as normal, and then creating small patches of bare ground either by heavy grazing or using chain harrows/spring tines.

On creation sites it is likely that sowing/spreading will need to take place on a fresh seed bed, so herbicide treatment and/or deep-ploughing may be necessary prior to seed introduction. This is hence only suitable on sites of no ecological value such as some former grass ley and arable sites. Be aware that soil disturbance through ploughing can lead to an increase in soil fertility which can restrict establishment of desirable grassland species. This may also bring seeds of weed species to the surface, so expect to undertake weed control for the first few years after creation.

Local grassland projects

There are now projects in many areas that provide expertise and machinery to help with seed harvesting and spreading. Please contact us to find out if one is operating in your area.



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