

Glorious Cotswold Grasslands

Land management advice pack

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Image: Martin Jones

Introduction

Do you own or manage grassland? We would love to hear from you.

Species-rich wildflower grassland can provide a wide range of benefits to you, your livestock, wildlife and the wider environment.

We can carry out botanical surveys to assess the condition of existing sites. We can advise on management of existing species-rich grassland sites to maximise their botanical interest. For other sites we can advise on enhancement and restoration methods. It may even be possible to create new wildflower grassland on sites not currently managed as grassland.

Once a management plan has been decided we can advise on preparation of sites and help with seed harvesting and distribution. Following any habitat management work we can provide ongoing support by follow-up botanical surveys and advising on subsequent management.

This pack provides a summary of current best practices, but as every site is different, the most appropriate course of action can only be determined following site visits and assessments. Please contact us to arrange a free site visit to discuss your grassland's future. Please note that we may make a small charge for some of the services provided to cover our costs and ensure the sustainability of the Glorious Cotswold Grasslands project in the long term.

Benefits

Species-rich wildflower grassland can provide a wide range of benefits to you, your livestock, wildlife and the wider environment.

Benefits to you and your livestock

- It is likely that less profitable areas will be the most suitable for restoration work and provide the greatest environmental benefits
- Various Higher Level Stewardship options (HK6, HK7, HK8) are available for grassland management, restoration and creation
- New Environmental Land Management Scheme is likely to focus on protecting and enhancing the environment
- Capital grants may be available for associated fencing or water supply costs
- No chemical input costs
- Provision of additional grazing can help reduce grazing pressure elsewhere
- Livestock can benefit from increased mineral intake and lower parasitic burdens and can command a higher price

Benefits to wildlife

- Increased botanical diversity and richness and protection of rare plants
- Increase in biodiversity throughout food chain: plants, invertebrates, mammals, farmland birds and raptors such as barn owls and kestrels
- Provision of nectar sources for pollinators – this can improve nearby arable yields
- Can enlarge or link other existing areas of good habitat

Benefits for the wider environment

- Protection of archaeological sites from cultivation
- Buffering of other areas from fertiliser run-off
- Reduction of soil erosion and flooding
- Carbon will accumulate in undisturbed grassland
- Improves landscape character/view – great from a public relations perspective

It should be noted that grassland with a high wildflower species diversity will likely have lower productivity/yield than 'improved' grassland, and so may require changes in livestock practices (e.g. hardier/traditional breeds, lower grazing intensity or timing of lambing) to accommodate this.



Image: Ian Boyd

Assessment of existing grassland sites

An initial site visit and botanical surveys are generally required to assess:

- the existing species diversity of the site and presence of indicator species
- the soil type/fertility and suitability of the site for restoration to species-rich grassland

Unimproved grassland has naturally low soil fertility, has never been reseeded nor had any chemical input. Consequently it has a high plant species diversity as there is low competition from vigorous grasses. In the Cotswolds, the underlying limestone geology results in base-rich soils and calcareous grassland – and we typically see indicator species such as:

- | | |
|------------------------------|------------------------|
| • common bird's-foot trefoil | • common rockrose |
| • kidney vetch | • devil's bit scabious |
| • oxeye daisy | • great burnet |
| • rough hawkbit | • greater knapweed |
| • cowslip | • horseshoe vetch |
| • lady's bedstraw | • small scabious |
| • salad burnet | • and wild thyme |
| • betony | |

Along our river valleys we also see lowland floodplain meadows. These have a different range of indicator species including ragged robin, meadowsweet and cuckoo flower. We recommend that a botanical survey is carried out prior to any change in management to assess the suitability of the site for restoration work, to measure a baseline, and to enable the success of any such change to be measured.

True unimproved grassland sites are rare and have largely been identified by older projects and surveyors. There is, however, a broad continuum from unimproved to improved grassland and many grasslands which have only received low or historical chemical inputs will still have reasonable species diversity and, provided that they do not have too many 'undesirable' species (such as creeping thistle *Cirsium arvense*, highly competitive species such as Yorkshire fog *Holcus lanatus*, or white clover *Trifolium repens*), they will be suitable for restoration work.

Sites with shallow soils or on steep slopes will increase stress on plants, reducing the vigour of competitive species and so are particularly suitable for restoration – even if they have a higher soil fertility. In some cases it is possible to weaken competitive grasses on fertile sites to make them suitable for restoration by the introduction of yellow rattle *Rhinanthus minor* seed in late summer/early autumn – a plant that is hemi-parasitic on grasses and legumes.

On sites with low species diversity and where the chemical history and soil fertility is unknown, we can arrange for soil testing to be carried out to assess the suitability of the site. Sites with a Phosphate index of 0 or 1 are most suitable and sites with a Phosphate index of 2 are generally unsuitable for restoration.

Restoration and creation of grasslands are more likely to be successful if ongoing cattle grazing is possible.

The Glorious Cotswold Grasslands team can carry out an assessment of your grassland site – please contact us for more information.



Images (l – r): Ian Boyd, Rich Tyler, Martin Jones

Management of existing species-rich grassland sites

Correct management of an old or newly established species-rich grassland is critical to its ongoing success. An improvement in management can even revive grassland in poor condition.

Grazing

Grazing is usually preferential to cutting alone wherever possible for a variety of reasons. An exception would be where a site has been managed as a hay meadow for many years, and then continuity of this traditional management should be a priority.

Cattle-grazing is best as cows can graze longer swards than sheep and break up tussocky 'thatched' grassland. The action of the cows' mouths tends to pull vegetation out creating a mosaic of sward height (sheep tend to nibble vegetation evenly to a short sward height). A heterogeneous sward height is good for many species of plants and insects because different species have different habitat requirements. Cows also disturb the ground, creating bare patches and bedding in the seeds, which helps many wildflower seeds to germinate. Cow dung is also used by a range of invertebrates. If only sheep are available this is still preferential to cutting, provided they are stocked at a low density. If the sward is particularly long, it may be necessary to reduce its height by cutting before introducing sheep to aftermath graze. Domestic horses can also be used but can be very selective and so can damage the flora unless they are at low densities. At high densities horses tend to create very short turf around patches of nettles, thistles and ragwort. Their dung can also increase nutrient levels unless removed regularly.

Intensity of grazing is important. Too little, and grasses and other competitive species will take over. Too much, and poaching can become an issue, with the remaining turf short and homogeneous – which will only suit a limited range of species. Ideal livestock density will depend on species and breed as well as the size and topography of the site, but generally low intensity 'extensive' grazing over a long period is used. Intensive 'mob' grazing can be particularly good for many plants, and minimises selective grazing but is generally bad for invertebrates.

Timing of grazing is also important. For example, grazing should be stopped from April onwards for several months as livestock (particularly sheep) tend to graze flower heads, weakening those species, removing seeds and encouraging more vigorous 'undesirable' species such as creeping thistle and ragwort. Ideally grazing should commence after the main flowering period and continue throughout the autumn and winter (until it becomes too damp) to remove dead vegetation, weaken grasses and prevent scrub encroachment. However, to minimise its impact on dormant invertebrates it is a good idea to graze rotationally.

Cutting

Where grazing is not possible on a site, grasslands should be cut once a year (no earlier than mid-July) to allow plants to flower and set seed. Cuttings should be wilted and turned in situ to allow seeds to drop before removal. The initial cut should be followed by a second 'aftermath' cut or some aftermath grazing in autumn. Ideally all cuttings should be removed to reduce soil fertility and to stop new seedlings from being smothered.

Cutting is difficult on steep ground and creates a homogenous sward which will only suit a limited range of species. It may damage structures such as anthills and does not create bare patches of ground or bed in the seed. If possible cutting should be done rotationally and at different heights, with wide margins left uncut to help address these issues and if aftermath grazing is available this will also help. A mechanical roller can be used to bed in new seeds.

If a site has been managed as a hay meadow for many years then continuity of this traditional management should be a priority.

Scrub

Some scrub is beneficial as it provides habitat for invertebrates and reptiles, as well as nesting birds. The early spring flowers of shrubs such as hawthorn and blackthorn can be an important early nectar source for insects. Some plants such as primrose and violets also thrive in partly shaded areas.

However, some management of scrub may be required to prevent it taking over large areas of grassland.

'Undesirable' species

Undesirable species such as creeping thistles, ragwort, stinging nettle or broad-leaved dock can be controlled by hand pulling or herbicide spot treatment. Care must always be taken not to damage non-target species.

The Glorious Cotswold Grasslands team can provide advice on the most appropriate management for your grassland and can assist with habitat management – please contact [us](#) for more information.

Enhancement and restoration methods

Natural regeneration from soil seed banks and nearby species-rich grasslands

This should always be considered as it is inexpensive and allows plants that would naturally be there to establish. However it is unlikely to be suitable in most cases as soil seed banks usually contain far more 'undesirable' species such as creeping thistle and ragwort than specialist grassland species, and the seed from these specialist species does not disperse far. It can also take a long time. This method is really only suitable for land which was previously species-rich and has only been cultivated for a short period, or infertile land with few 'undesirable' species present with adjacent species-rich grassland from which seed is likely to spread naturally, for example by livestock movement. Natural regeneration can be speeded up by harvesting seed from the adjacent areas and distributing on the new areas.

Brush harvested seed

This is, in many cases, the best method. It allows seed to be harvested from a wide variety of plants originating from a local site with similar characteristics and genetics. The composition will depend on which species are setting seed at the time of harvest and so it may be desirable to collect seed more than once to increase the range of species harvested. It requires specialist machinery and operators, however Glorious Cotswold Grasslands has its own purpose built seed harvester, which can be used to harvest seed from donor sites across the Cotswolds AONB – please contact us for more information.

Donor sites: A ratio of 1:3 donor: recipient is generally advised. Using a towed brush seed harvester may not be suitable on some sites due to topography, invertebrates or ground nesting birds. An alternative is a hand-held suction seed collector.

Removing seeds from a site can damage a donor site therefore it should only be done on a section of a site in any one year and not every year. It does not affect the hay crop for the farmer.

(c) Green hay

This is a similar method to brush harvested seed. Hay is collected from a donor site directly after cutting without wilting or turning (as this ensures more flower heads are retained). Dried hay is generally unsuitable as most seeds are lost during the drying process. Green hay must be spread on the receptor site within a few hours of being cut otherwise it can heat up reducing the viability of some seeds and so it can be logistically difficult on large sites. Green hay spreading can be collected and spread using standard farm machinery rather than specialist equipment but it can be difficult to handle due to its weight, and the composition is limited to whatever species have set seed by the time of cutting (and so a late cut is generally best). On smaller sites green hay can be collected by strimming.

Donor sites: A ratio of 1:3 donor: recipient is generally advised. Cutting may not be suitable on sites which are not normally cut due to topography, invertebrates or ground nesting birds. Removing green hay from a site can damage a donor site therefore it should only be done on a section of a site in any one year and not every year. The farmer will lose the value of a year's hay crop.

(d) Wildflower seed mix

This is the usually the least favoured option due to the difficulty of sourcing local, native seeds from a similar soil type but can be used where no local donor site is available or if plants which tolerate higher fertility soil are required. Commercially available seed mixes may contain alien or hybrid agricultural species, seeds sourced outside the UK or seed collected from different areas of the UK. Most UK collected seed will have then been multiplied by growing as a field crop. The primary advantage of seed mixes is that the composition is known and can contain a wide range of species for a particular habitat – though they will not contain some difficult-to-grow species.

Preparation of sites

The recipient site must be prepared to ensure it has a short sward (removing any cuttings) and up to 50% bare ground to encourage seed germination, in patches at least 10cm diameter. This can be achieved by cattle or by using machinery such as disc or tined harrows to scarify the ground.

Undesirable species such as creeping thistle, ragwort, stinging nettle or broad-leaved dock should be controlled by hand pulling or herbicide spot treatment. Care must always be taken not to damage non-target species.

Ground disturbance may not always be appropriate if the site is of archaeological interest, if there is a risk of erosion or if there are ground nesting birds.

The above advice is applicable to ground being prepared for harvested seed, green hay or wildflower seed mixes.

The Glorious Cotswold Grasslands team can provide advice on preparation of your site – please contact us for more information.

Seed harvesting and distribution

Using locally harvested seed is, in many cases, the best method for restoration of grassland sites.

Seed harvesting

Glorious Cotswold Grasslands owns a purpose built brush seed harvester which can be used to harvest seed from donor sites. It may also be possible to collect seeds by using a hand-held suction seed collector. Donor sites should be local to the recipient site to ensure similar characteristics and genetics.

Seed distribution

Seed should ideally be sown immediately after harvesting onto a pre-prepared site as this removes the need to dry and store them. If that is not possible, we can dry and clean seed to be spread in late summer/early autumn. Seed can be bulked up using silver sand or sawdust to enable it to be spread evenly. Seed is usually spread by hand, particularly if uncleaned. After spreading, seed should be bedded in with a roller or by livestock.

The Glorious Cotswold Grasslands team can provide advice on and practical assistance with seed harvesting and distribution and has links with many donor sites across the Cotswolds AONB – please contact us for more information.



Image: Nick Turner

Glorious Cotswold Grasslands – ongoing support

Correct management in the first year or two of a newly restored grassland site is critical to its success. The advice below is applicable to sites restored using harvested seed, green hay or wildflower seed mixes. Once a site is established as species-rich grassland, it should be managed as described in our page on management of existing of existing species-rich sites.

First autumn/winter

A short sward should be maintained throughout the late summer and autumn/winter period following seed distribution so light can aid germination and to reduce the vigour of competitive grasses and ‘undesirable’ species. This can be achieved by low intensity ‘extensive’ grazing over a long period or intensive ‘mob’ grazing – the latter can be particularly useful in the first year to prevent the seedlings being selectively grazed. If grazing is not available the sward can be kept short by cutting (removing any cuttings). As a rule of thumb, when sward height reaches 10-15cm it should be grazed or cut to 5cm. If green hay is used rather than seed, the site should be grazed 2 - 3 weeks after spreading to stop the hay smothering the site whilst first allowing seed to drop.

- Livestock should be removed when the ground gets too wet to prevent poaching.
- Undesirable species should be controlled by hand pulling or herbicide spot treatment.
- Slugs should be monitored and treated if necessary as they can decimate wildflower seedlings.

First spring

The cutting or grazing regime described above can be continued into early spring until the plants start flowering and birds start nesting. In spring/early summer, cutting or grazing should be reduced or stopped for several months to allow plants to flower and set seed.

Undesirable species should be controlled by hand pulling or herbicide spot treatment.

Summer

We recommend that a botanical survey is carried out to measure the success of the management work. Species diversity and indicator species should increase, although many species may only develop as basal rosettes rather than flowering heads in the first year. Depending on the results, the site can then managed as described in our page on management of existing of existing species-rich sites, re-

surveyed in the following year or considered for further enhancement or restoration work.

The Glorious Cotswold Grassland team can provide advice on and assistance with ongoing management and monitoring of your site as part of a land manager support package for a small annual charge – please contact us for more information.



Images: Ian Boyd