

Restoring species-rich grassland by natural regeneration and colonisation

Natural regeneration of wildflower and grass seed is one of the cheapest and easiest methods of enhancing the plants present in grassland. It does require that the donor species-rich grassland is adjacent to the recipient grasslands to be restored and there is livestock access between the sites. The key to success is allowing livestock to move between

the donor and recipient sites, and re-establishing traditional management grazing or hay-cutting practices. This process is entirely about grassland management and, although slower than transferring seeds using green hay, brush harvesting or a seed mixture, it does have the advantage that wildflowers appear once the right conditions are reached.





Site preparation

- All wildflowers have a range of environmental limits. If soil nutrients, pH or water levels differ between the donor and recipient, this may affect the germination and spread of the plants. Undertaking [soil nutrient tests](#) is a good method to find out whether the land falls within the expected range of tolerance of most plants. If the environmental limits are exceeded, then seeds may not germinate, so it is important to research the current conditions of your sites.
- The recipient site needs to be suitable for livestock with appropriate fencing and water troughs. If the site lacks specific minerals essential for livestock, these could be made available using supplements (such as mineral licks).
- Control problem weeds such as docks, thistles and nettles, either by hand-pulling, or spot-spraying (seek advice on suitable products and do not use alongside waterways). It may take more than one year to control these plants and should to be done with enough time for to be effective. Using herbicides after restoration will also kill wildflowers and grasses. The recipient site is not suitable if it has a high weed problem and an alternative site should be chosen.
- If possible, there should be direct access between the donor and recipient grasslands to provide the shortest transfer route for seeds caught on livestock. Seeds carried in this way may fall off on-route between the donor and recipient sites, if the fields are too far apart.
- Create a short vegetation sward in the recipient field during the preceding autumn and spring, before restoration. The objective is to create bare ground - at least 50% - as all wildflower and grass seed need to touch bare soil. They also require a low level of competition with any vegetation already present to be able to germinate and survive.
- If your recipient site is a grassland, create 50% bare ground in June to Mid-July by:
 - allowing livestock (ponies, cattle and sheep) to graze the recipient field, reducing vegetation growth. The recipient site should not be poached by livestock hooves. Poaching (or pugging) is where cattle, ponies and sheep leave pock-marks with their hooves in grassland, particularly after wet weather, on clay soils with poor drainage. This denudes large areas of any vegetation and can cause damage, particularly compaction. It can also increase weeds such as docks.

Livestock should be removed from the field if there is very wet weather or if poaching in gateways or along fence lines starts to become apparent

- livestock grazing can be by pulse grazing (increasing, and then decreasing, the number of livestock for a short period of time) or by extensive grazing (a lower number of livestock are allowed to graze for a longer period) to reduce the vegetation cover and create bare ground. This is not an exact science, and livestock should be removed if they start to cause damage or there is not enough fodder. Alternatively, animals could be added to increase the amount of grazing and creation of bare ground.
- do not supplementary feed livestock (giving them additional hay or silage on top of the vegetation growing in the field).
- additionally or alternatively, scarify the field using a disc and/or chain harrow. Tine harrows can also be used to remove grass thatch.
- a combination of livestock grazing and mechanical management is useful in the first instance to create bare ground.
- If your recipient site is an arable field, create bare ground in early July by:
 - cultivating the field but not sowing a crop - leave the ground bare.
 - do not fertilise the land, as wildflowers and grasses want low nutrient levels compared with arable crops.
 - there is no need to graze the recipient site as the bare ground is created through cultivation.
- If there are historical features on your land, consult with the relevant

authority on your proposed works, as soil disturbance to create bare ground can be damaging to buried archaeological features.

- Creating bare ground may stimulate problem weeds to grow such as thistles, docks and ragwort which may need controlling.

Active restoration / recreation

- In mid-June to August, as the flowers and grasses begin to set seed in the donor site, open the access between the fields and allow the livestock to move between them. The animals will pick up the seed and transfer it between the fields. This is treating the land as pasture rather than hay meadow. The livestock should be allowed to roam extensively at low numbers across the whole of donor and recipient fields.
- Seeds need to be in contact with bare ground to germinate. Trampling by livestock will complete this process for you. Let the livestock continue to graze the fields into the autumn, but remove them if the ground becomes too wet, they have eaten the vegetation down to a suitable height, and over winter as they may cause damage to the donor and recipient sites.
- If the recipient site is arable, extra care must be taken to ensure that there is enough fodder for the livestock. Once the donor field has been grazed, the animals should be removed from the fields.



Post-restoration /-recreation management

- Most grassland wildflowers are perennial. Seeds germinating in the first year of restoration may only form a rosette of leaves and not flower. These plants will bloom from the second year onwards. The exception to this is yellow rattle, which is an annual flower and a hemi-parasite of grasses. It helps reduce the number and vigorousness of grasses and is a beneficial plant in grassland restoration and recreation.
- If there is a good amount of vegetation growth over the winter, put a low number of livestock back onto the recipient site in the first year following restoration. The objective is just to reduce the vegetation and not to create bare ground. Be careful that the livestock do not nibble young shoots of yellow rattle; they should be removed if this starts to happen.
- During the flowering season of April to July in the first year, do not graze the donor and recipient fields - this will allow flowers to bloom, particularly yellow rattle. This is called 'shutting-up' the fields.
- In mid-June to August, just as the donor site is setting seed, allow livestock to extensively graze throughout the donor and recipient fields. This will remove the vegetation growth but still transfer seeds between the sites, providing further enhancement over years.
- Continue with grazing in the autumn, until the weather gets too wet and the vegetation has been eaten. Remove the animals in the winter, as livestock can damage grassland by poaching. Bring back the livestock in spring, if there has been vegetation growth over the winter period, to remove this before shutting-up the fields. This should all be considered as part of the [future management](#) of the grassland.
- If a hay-making regime is desired, from the second year after restoration the recipient and donor fields should be 'shut-up' as normal in April. But, mid-July to August, the fields should be cut for hay rather than letting livestock out for grazing. Aftermath grazing should follow the hay cut once the grass has grown a little. Leaving wide margins uncut around the edge of the fields will provide nectar and pollen for pollinators (bees, hoverflies, beetles, wasps etc.) over the summer and early autumn. Also, cutting hay across the field, or from the centre outwards, allows insects and animals to escape; cutting around the outside of the field first can trap wildlife in the uncut field centre.
- To increase wildflowers and fine grasses, hay taken from the donor site could be used as supplementary livestock feed in the autumn. There are fewer viable seeds that fall out of hay compared to those that are transferred directly under a pastoral regime, but a variety of pastoral and hay-making management can be accommodated, depending on weather patterns and numbers of livestock. If hay is supplementary fed to livestock, it should be strewn around the field rather than being placed at the same location or using ring feeders.
- Alternatively, if the fields are to be used as pasture, continue with the extensive livestock grazing in the same pattern as described.

Natural regeneration takes much more time than the other methods of grassland restoration or recreation, but helps preserve the local distinctiveness of wildflower grasslands and is relatively cheap compared with the other restoration methods.

Restoring wildlife-rich grasslands using natural regeneration timeline

