Technical Note TN629

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Management of species rich grasslands

SUMMARY

- **Species-rich or wildflower-rich grasslands support a wide range of wildflowers, many of which are becoming uncommon in the Scottish countryside.**
- **Species-rich grasslands are very important for many invertebrates providing both nectar and larval foodplants.**
- **Between 1983-2005 it is estimated that approximately 40% of species-rich grassland has been lost in Scotland.**
- **The remaining areas of species-rich grassland are under threat from a range of factors, including the spread of bracken and scrub, over-grazing, the loss of livestock grazing in some areas, application of lime and fertiliser and tree planting/woodland regeneration.**
- **Species-rich grasslands are often under-valued, as it is not immediately obvious that they are an extremely important wildlife habitat.**

Introduction

The species-rich grasslands referred to in this Technical Note are the naturally occurring, unimproved grasslands that support a diverse range of wildflowers. These may be grasslands on neutral soils, calcareous grasslands found on base-rich soils or wet grasslands found on damp soils. Some acid grasslands can also be species-rich.

The Technical Note provides guidance on good practice to protect, manage and if necessary restore these grasslands.

Harebells on Barra

Status of Species-rich Grasslands in Scotland

It is estimated that around 40% of the species-rich grasslands have been lost in the past 23 years. A push to increase productivity on farms has led to loss of the more accessible grasslands, where they have either been ploughed and replaced with arable crops or improved grassland. In some less accessible areas applications of lime and fertiliser has seen the disappearance of most of the wildflowers, as the lime and fertiliser encourages the grasses to grow rapidly and out-compete the wildflowers.

Areas of valuable species-rich grassland have been lost as bracken has increased its range, as the grasslands are gradually replaced by dense bracken litter. Where grazing levels are not high enough to control the

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regeneration of scrub (birch, willow, hawthorn, gorse, broom etc), the scrub eventually shades out the grassland.

Excessive grazing, particularly in the summer months prevents the plants from flowering and setting seed, and therefore the diversity of the plants in the sward diminishes.

A recent threat to grasslands in some parts of Scotland has been the loss of livestock. Grasslands depend on a cutting or grazing regime to remain in good condition. Where grasslands are under-grazed and not managed by cutting they become rank and scrub and bracken become established and shade out the wildflowers.

Wildlife value of species-rich grasslands

A wide range of wildlife depends on species-rich grassland, such as bumblebees and butterflies. Species-rich grasslands are essential for many invertebrates, and these in turn provide the basis for a complex food chain – so if the species-rich grasslands are lost, then so will many other species be lost. Species such as the northern brown argus, common blue and small copper butterflies can be seen feeding on the wildflowers during the summer months. Anthills, an increasingly rare sight, can be found in unimproved and species-rich grasslands.

Birds such as skylark, lapwing and curlew breed on these grasslands and benefit from the rich insect-life, as this provides essential feeding for chicks.

Northern Brown Argus

Management of Species-rich Grasslands

Grazing

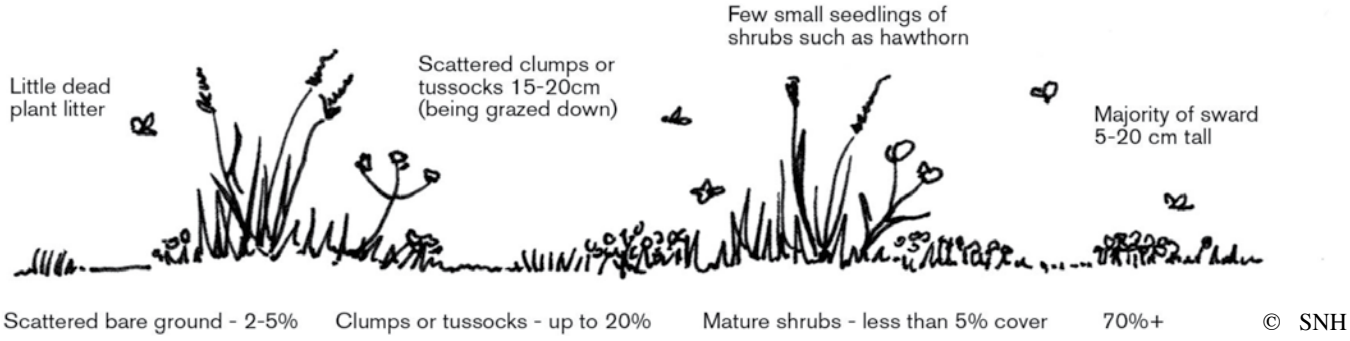
Stock grazing is an important management tool for grasslands. Ideally light grazing throughout the year should be undertaken, as this can provide a mosaic of sward structures and prevents the grassland from becoming rank. Summer exclusion of grazing has been popular in recent years, in order to encourage flowering and seed set, but this has often led to the formation of rank vegetation which is difficult to graze. If the summer grazing is quite light, then flowering and seed set can still occur, without the development of dense, rank vegetation. Advice should be sought on the optimum stocking rate for the site (and whether a short exclusion period of 4-8 weeks may be beneficial), but as a general rule summer grazing should be at 0.5 lu/ha or less to allow flowering to take place.

The aim with grazing is to create a varied sward structure throughout the year, with a mosaic of taller grassland, medium height grassland, shorter areas and even occasional bare patches.

Cattle are better suited to taller grasslands, and they are also less selective than sheep. With shorter stature grasslands, particularly on fragile sites, it may be that sheep are better suited. Generally horses should not be grazed on species-rich grasslands as they can have quite damaging impacts due to their tendency to form latrines. However, on certain grasslands native ponies, such as Highland and Shetland ponies, have been used successfully to graze the sites. They seem to be particularly suited to sites with damp/wet grassland.

Supplementary feeding should not be undertaken on species-rich grasslands, as this tends to lead to problems of localised poaching and enrichment, which encourages weeds at the expense of the wildflowers.

Ideal grassland structure for the summer months



Cutting

Cutting is a useful method of management, particularly on farms where there is no livestock. However, the impacts of cutting are significant for invertebrates and small mammals, as all of the grassland cover is removed at the same time. With grazing management the changes to the grassland structure are quite gradual.

Where cutting is undertaken, it should be carried out as late in the summer as possible. This will have two main benefits. Firstly it will avoid destroying the egg/chicks of breeding birds and killing leverets. Secondly it will provide a good flowering period before cutting, and therefore provide a source of nectar and pollen for many insects. Later cutting will also provide some plants with enough time to set seed and regenerate.

The pattern of cutting is important. Cutting in a wildlife-friendly pattern, from the inside towards the outside, will help to push wildlife out of the field, rather than trap them in the centre. This significantly reduces wildlife casualties. A 2m uncut strip should be retained to provide a refuge for the species displaced by the cutting. This strip will also be valuable habitat for invertebrates.

Grass cuttings should always be baled and removed from the site. Cuttings which are left *in situ* will smother out areas of grassland, add to the fertility of the site and result in the loss of much of the species richness.

Grazing after cutting (aftermath grazing) has been shown to maintain the species-richness. and in some cases has increased the species-richness.

Weed control

Species-rich grasslands can become seriously infested with perennial weeds such as creeping thistle, nettles, ragwort and docks. If left untreated, these weeds can result in significant deterioration of the grasslands.

In order to protect the wildflowers within the grassland, it is essential to avoid boom spraying the grassland with a broadleaved herbicide. Ideally, spot treatment of the weeds should be undertaken before the weed problem becomes too widespread.

If used carefully an ATV mounted weed-wipe can be an option, but extreme care is required to protect the species-rich grassland. Before any weed wiping is contemplated the grassland should be grazed down to a height of < 10cm, leaving the perennial weeds standing well clear of the grassland. Using a 'non-drip' weed wipe, and a selective herbicide, the weeds can then be wiped. However, if this is not undertaken using extreme care, it can be very damaging, and many of the wildflowers will be lost.

Where ragwort is present, sheep grazing in the spring and early summer can prevent it flowering and spreading.

Invasive non-natives

Valuable grasslands in close proximity to watercourses are increasingly being invaded by introduced species such as Himalayan balsalm, Japanese knotweed and Giant hogweed. These plants can spread extremely quickly, and should always be controlled when they first start to invade.

Advice should be sought in order to carry out the most effective control.

Restoration

Bracken

The spread of bracken gradually smothers the ground vegetation, resulting in the loss of areas of species-rich grassland. Where possible bracken control should be undertaken whilst a reasonable range of wildflowers and grasses remain beneath the bracken, so as to provide a source of plants to regenerate across the site once the bracken is controlled. If the ground vegetation has been completely replaced with dense bracken litter, it may be necessary to take advice about how to encourage the ground vegetation to regenerate. As a last resort it may be necessary to purchase a suitable seed mix to re-seed the area, once the bracken litter has been dispersed by livestock trampling.

Bracken control can be undertaken by:-

- Asulox – a relatively specific herbicide, which can be applied manually, by quad bike/tractor or aerially during July/August. Other ferns and a variety of other plants are susceptible to damage by Asulox, so the area should be surveyed for "sensitive" species prior to spraying.
- Glyphosate – this herbicide will kill almost all plants it comes into contact with, so extreme care is required if using Glyphosate.
- Mechanical control – various crushers and rollers are used to control bracken fronds. It is recommended that this type of control is undertaken 3 times per year for it to have an impact on the density and distribution of the bracken. This method can be very damaging to ground nesting birds.
- Cattle can be useful in controlling the spread of bracken across small areas.

It is important to remember that where there are pearl bordered fritillary butterflies present, bracken on south-facing sunny slopes is an important element of their habitat. Seek advice before undertaking control.

Scrub

Trees and shrubs, such as birch, hawthorn and blackthorn find it relatively easy to regenerate on species-rich grasslands, when the grazing levels are reasonably low. A mix of species-rich grassland and scrub can provide excellent habitat, but once the regeneration of scrub gathers pace, the species-rich grasslands can become shaded out.

Ideally the existing scrub should be cut back and removed and the stumps treated with a suitable herbicide such as Timbrel, alternatively, the re-growth can be sprayed. Where the scrub is relatively small stature, it may be adequate to use a foliar spray, rather than cutting it back first.

The grazing regime should be reviewed to try to get the timing and numbers of stock to a level where the grassland is maintained in good condition, but the scrub prevented from regenerating. Grazing exclusion periods have been linked to the spread of scrub on many sites, so should be avoided if scrub regeneration is occuring.

Damaged grasslands

Where the species-rich grassland has been damaged by practices such as the application of lime, fertiliser or FYM, or the use of herbicides, there are various methods that can be implemented to restore the "species richness".

Yellow rattle – where past management has encouraged the grasses to dominate at the expense of the wildflowers, adding yellow rattle to the sward can reduce the proportion of the grasses in the sward, and provide space for the wildflowers to regenerate and spread. This occurs because yellow rattle is a parasitic plant which 'feeds' on grasses.

Seeding patches – areas within the damaged grasslands could be cultivated or scarified and a suitable seed mix 'sown in'. As these seeded patches develop, they can then provide seed to spread into the rest of the grassland.

Grazing regime – damaged grasslands can revert to more species-rich grasslands if the management is changed to encourage flowering and seed set of the remaining wildflowers. This process can take many years, so the results will not be dramatic. If practical, managing the area as a late-cut hay field can encourage the spread of wildflowers.

Sward enhancement using green hay – this technique aims to increase the wildflower component of the grassland by spreading species-rich green hay across a degraded grassland to provide a source of wildflower seeds. The receptor site must be prepared in order to create a 'seed bed' prior to the green hay being spread. This involves either heavy stock grazing and/or cutting and mechanical disturbance to create a short sward with 30-40% bare ground. This will allow the seed to come into contact with the soil, and also reduce competition between the seedlings and the surrounding vegetation.

The donor site, where the green hay is to be produced, should be similar in characteristics to the receptor site and needs to be species-rich and free from weeds. One hectare of green hay can be spread across 3 ha of donor site. The green hay site needs to be shut up for 8-12 weeks to encourage flowering and seed set. Cut material should be collected within 24 hours and spread the same day. The green hay should be spread thinly and left for several weeks for the seed to fall. The site should then be grazed or rolled to dislodge and bed in seed. The sward should be kept short for the rest of the year so that light can aid germination.

This method requires a high level of planning and organization and advice should be sought to maximise the chances of success.

All of the above restoration techniques need to be tailored to the site, and the species present, so advice should be sought to maximise the changes of the restoration being successful.

Protection of species-rich grasslands

- GAEC – under the Good Agricultural and Environmental Conditions (GAEC) Regulations there is some protection afforded to species-rich grasslands (and other semi-natural habitats). These measures are mandatory and must be followed in order to comply with Cross Compliance.
    - Undergrazing and overgrazing must be avoided.
    - Ploughing pasture of high environmental value is prohibited.
    - Semi-natural areas should not be ploughed, levelled, re-seeded, drained, etc.
    - Lime and/or fertiliser should not be applied to semi-natural areas.
- Tree planting – because of the scarcity of species-rich grasslands, they should not be selected as areas for new woodland planting. The process of tree planting, and then the eventual shade from the trees will result in the loss of most of the species-richness.

Species-rich Grassland with Greater Butterfly Orchids

Grants for Managing or Restoring Species-rich Grasslands

The SRDP (Scottish Rural Development Programme) Rural Priorities Scheme provides payments for managing or restoring species-rich grasslands, and for establishing new wildflower grasslands.

At the time of writing the options available are as follows:-

Management of Species-rich Grassland.

Management of Habitat Mosaics.

Restoring or Creating New Species-rich Grasslands.

There are also capital payments for bracken control, scrub control and fencing, and for wildflower seed if required.

Further Information

Further information on species-rich grasslands can be obtained from:

Scottish Agricultural College (SAC) Conservation Services.

Scottish Natural Heritage (SNH).

Butterfly Conservation.

The Bumblebee Conservation Trust (BCT)

There is also information on the UK Biodiversity Action Plan website (www.ukbap.org.uk) and many of the Local Biodiversity Action Plan (LBAP) websites.

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