

Conservation Grazing of Semi-natural Habitats

SUMMARY

- **Appropriate grazing is essential to maintain many important habitats in Scotland**
- **A grazing management plan must have clear objectives**
- **Guideline stocking rates for many semi-natural habitats provide a starting point for grazing management**
- **The choice of livestock will depend on the type of habitat being managed, as well as practical considerations. The effects of wild herbivores must also be taken into account**
- **Seasonal grazing may be preferred for practical reasons or to protect specific features (e.g. ground-nesting birds; tree regeneration), but in many situations, moderate year-round grazing is ideal**
- **Particular livestock welfare issues may need to be addressed when grazing semi-natural habitats**
- **It is important to monitor the effects of the grazing plan and to use this information to make adjustments if the objectives are not being met**

Introduction

The long history of human settlement and use of the Scottish landscape means that most of the habitats that we value for their biodiversity have been maintained or created by human management practices, and in particular, grazing by domestic livestock. At least 16 of the 29 UK BAP priority habitats occurring in Scotland are dependent to some degree on grazing. In the recent past the demand for ever-higher agricultural

production meant that semi-natural habitats were often under threat from over-grazing. This is still a danger in some areas, but increasingly it is the loss of livestock, particularly cattle, from some areas and the resultant under-grazing which is causing concern. In some cases, wild herbivores may help to maintain habitats, but are less easy to control than domestic livestock. There is now a strong interest in ensuring that domestic livestock continue to graze semi-natural habitats, with biodiversity conservation as the main objective.

Determining the aims of grazing

The starting point for any grazing plan should always be a site survey, which will also provide a baseline for future site monitoring. The survey should record the extent of different habitats within the site (using a standard methodology such as Phase 1 or NVC), the dominant plant species and the presence of any priority species that need to be taken into account. The existing management regime should be recorded, as should the condition of the vegetation (e.g. indicators of browsing and grazing). The Joint Nature Conservation Committee (JNCC) has developed detailed Common Standards Monitoring guidance on determining good site condition for a wide variety of semi-natural habitats, using attributes such as positive and negative indicator species, sward height and amount of litter (dead plant material).

The survey should help determine what the overall aims of grazing are. In many cases it will simply be to maintain or achieve good site condition to benefit a wide range of species, while in other cases it may be species-specific and may require a more detailed plan (e.g. to benefit Scottish Primrose or Marsh fritillary butterfly). In open habitats, the aim of grazing might be to provide maximum structural diversity for the benefit of invertebrates. In woodlands, it might be to create favourable conditions for tree regeneration, or it may be to maintain open habitats within the woodland.

If the existing grazing management is close to that recommended after reading this note, and the habitat is in good condition, then there is probably little need to alter the management.

Setting an overall stocking rate

The appropriate overall stocking rate for a site is dependent on the aims of management. To maintain good site condition, a balance must be achieved between the annual production of dry matter in the vegetation and the utilisation of this production by grazing herbivores. If the utilisation is too low there will be a build-up of dead plant material, while if it is too high there will be a loss of structural diversity in the vegetation, both situations usually resulting in a loss of biodiversity.

It is possible to provide guideline overall stocking rates (LU/ha/year) for many habitats (table 1). However, these can vary by 20-40%, depending on soil fertility and rainfall. As a result the guideline figures should only be used as a starting point and adjusted if necessary, depending on more detailed knowledge of the site or following a period of monitoring. Species-specific management or restoration of sites that are in very poor condition (e.g. under-grazed or over-grazed) may require a level of utilisation that is higher or lower than these guidelines.

The numbers of wild herbivores (e.g. deer and rabbits) on a site should be taken into account as they may contribute a significant number of livestock units.

Table 1: Guideline annual average stocking rates for a range of semi-natural habitats

	Guideline annual average stocking rate LU/ha/year
Grassland	
Improved grassland (e.g. Lolium)	1.00
Unimproved lowland grassland	0.30 – 0.40
Unimproved upland grassland (e.g. Nardus)	0.15 - 0.25
Moorland	
Young heather (<20cm)	0.20
Intermediate heather (20-40 cm)	0.05
Old heather (>40 cm)	0.02
Blanket Bog	0.06
Woodland	
High fertility (e.g. Lowland broadleaves)	0.15
Moderate fertility (e.g. Birchwood)	0.07
Low fertility (e.g. Native pinewood)	0.03
Mob-stocking to enhance regeneration*	0.25 - 0.50
Wetland	
Rush pasture	0.40
Lowland raised bog	0.05
Swamp and fen	0.03
Coastal	
Coastal sand dunes	0.10 - 0.30
Coastal heath	0.15 - 0.30
Saltmarsh	0.25 - 0.50

* For short periods only



Table 2: Calculating an appropriate annual stocking rate to maintain a 120 ha habitat mosaic

Component Habitat	Overall annual stocking rate	Area of each habitat	Livestock Units per annum
Birchwood	0.07 LU/ha	60 ha	4.2 LU
Rush pasture	0.40 LU/ha	40 ha	16.0 LU
Acid grassland	0.25 LU/ha	20 ha	5.0 LU
Total		120 ha	25.2 LU
Overall stocking rate		0.21 LU/ha/annum	

Habitat Mosaics

On larger sites, there may be a mosaic of different habitats present (e.g. woodlands, wetlands and grasslands). If the aim of management is to maintain that mosaic then the initial stocking rate should be determined by the proportion of the site occupied by each habitat (see table 2). If management is aimed at one component of the mosaic then an appropriate stocking rate for that component should be used. Monitoring is particularly important in habitat mosaics, as grazing animals may not graze each component habitat at the appropriate rate, leading to localised over- and under-grazing. As a result more careful stock management may be required.

Choosing the livestock

In most situations the choice will be between cattle and sheep for grazing. Apart from practical considerations such as the availability of stock, there are differences in the way that cattle and sheep graze vegetation. Cattle are more dependent on quantity rather than quality of vegetation when compared with sheep and are usually less able to select the most nutritious vegetation at a fine scale. As a result they are less likely than sheep to remove flowering heads if grazed at a low stocking rate in spring and summer. However, cattle also tend to cause more trampling damage than sheep and are more likely to cause localised nutrient enrichment through dunging. Due to this difference, cattle are often preferred in more fertile habitats with large quantities of rank vegetation such as rush pastures and coarse grasslands (e.g. Molinia). Sheep are generally preferred in more nutrient-sensitive habitats and areas that are vulnerable to trampling damage, such as blanket bogs and lowland raised bogs. Sheep are also more suitable for grazing small areas, steep slopes and areas where the conservation interest is highly localised. In many habitats, a mixture of cattle and sheep will probably provide the maximum structural diversity to the vegetation.

There is often a preference for using hardy native breeds for conservation grazing as they tend to be better able to utilise poor-quality semi-natural vegetation than continental breeds, and cause less trampling damage due to their smaller size. Native breeds also have a high aesthetic value, although continental breeds can also effectively graze many semi-natural habitats if they have previous experience of that type of vegetation.

**Table 3: Livestock Unit values for a range of livestock**

Livestock type	Livestock Units (LU)
Ewe	0.12
Ewe and lamb	0.15
Beef cattle 6-12 months	0.4
Beef cattle 12-24 months	0.6
Beef cattle >24 months	0.8
Suckler Cow and calf	1.0
Horse >24 months	1.0
Ponies >24 months	0.8
Red deer	0.25

Setting the season and duration of grazing

An overall annual stocking rate of 0.25LU/ha/year can be achieved in a variety of ways. For example: 0.25 LU/ha year-round, 0.5LU/ha for six months, or 2LU/ha for six weeks. Seasonal grazing may be preferred for practical reasons, such as the availability of suitable livestock, the difficulties in maintaining livestock (particularly cattle) condition during the winter on upland or low-fertility sites, as well as the fact that a short period of grazing at a high stocking rate may be the only way of achieving the overall average stocking rate on small sites. There are also conservation reasons for seasonal grazing as certain habitats have sensitive periods of the year when grazing is more likely to have a negative impact e.g:

- Woodland regeneration and heather are vulnerable to grazing damage in the winter when more palatable foods are in short supply.
- Blanket bog and lowland raised bog are vulnerable to erosion due to trampling during the winter
- The nests of wading birds are vulnerable to trampling by livestock between April and early June (see table 4)
- Wild flowers such as orchids are vulnerable to heavy selective grazing in the summer, particularly by sheep.

Where seasonal grazing is being considered on sites which are important for any of these features, a useful rule of thumb is to ensure that the maximum stocking rate during the sensitive period does not exceed the overall average annual stocking rate given in table 1. In some cases it may be appropriate to exclude grazing altogether during the sensitive period. However, summer grazing exclusion will usually need to be followed by a period of higher than average grazing to remove the build-up of grassy and herbaceous vegetation. This may not be a problem on low-fertility sites, but on more fertile grassland and rush-pasture sites, livestock may have difficulty fully utilising the rank vegetation that

develops and long grazing exclusions are not recommended. In sites that are a mosaic of woodland and open habitats, livestock (and deer) may concentrate in the woodland areas for shelter during the winter, resulting in localised stocking rates far in excess of the overall site stocking rate. In this situation, winter grazing is probably best avoided altogether. By contrast, for open sites where management aims include prevention of woodland or scrub encroachment, a winter stocking rate higher than that tolerated by woodland regeneration may be desirable.

Table 4: Approximate percentage of bird's nests destroyed by trampling at different stocking rates in wet grassland (adapted from Green, 1986)

Stocking rate	2 cattle/ha or 6 sheep/ha	1 cattle/ha or 3 sheep/ha	0.35 cattle/ha or 1 sheep/ha
Lapwing	35%	20%	<10%
Snipe	55%	35%	20%
Redshank	65%	50%	25%

Note that sheep are twice as likely as cattle to cause nest destruction for the same number of livestock units

Where seasonal grazing is chosen for a site, the shorter the grazing period the higher the stocking rate required for that period. Higher stocking rates create an increased risk of physical damage to the habitat such as soil erosion and nutrient enrichment, so in most cases it is advisable to have as long a grazing period as possible. As a rough guide, grassland habitats should be grazed for a minimum of 2 months per year (1-4 LU/ha maximum), rush pastures for at least 3 months (2 LU/ha maximum) and heathland for at least 5-6 months (0.3 LU/ha maximum).

While it is normal practice to implement a similar grazing regime from one year to the next, there are circumstances where the grazing regime of a site could alter significantly from year to year. In many lowland areas, the only fragments of unimproved or species-rich grassland are on steep banks that cannot be cultivated. Historically, the botanical diversity of such sites may well have been maintained by the rotational management of adjacent areas of arable land. In years when a field was cropped, adjacent unimproved banks would have received very little grazing, while in years that the field was in grass the banks may have been heavily grazed all summer. As lowland farms have tended to become specialised towards arable or livestock, many unimproved banks have deteriorated through under-grazing or over-grazing.

Livestock welfare and management

It is essential that high standards of animal health and welfare are maintained under a grazing management plan. Physical dangers (deep ditches, quaking bogs), fencing, access for management and monitoring, food and drinking water are all factors that must be considered. Food availability is a particular concern for cattle during

the winter months, as many semi-natural habitats are unable to provide sufficient nutrition to maintain livestock condition year round. If this is the case, it will be necessary to either remove the livestock for a period and feed them elsewhere on higher quality forage, or provide them with supplementary feeding in situ. The latter option can create problems of nutrient enrichment and sward damage around feeding sites and is best suited to large areas, where any damage will have a limited overall effect. It may be appropriate to move feeding sites at regular intervals to reduce damage, but if there are existing feeding areas that have already been damaged, it may be better to use these 'sacrificial' areas to prevent further damage. In all cases the requirements of Good Agricultural and Environmental Condition (GAEC) should be considered.

Monitoring

Given the number of variables that can affect the outcomes of a grazing management plan, site monitoring is essential to ensure that the aims of management are being achieved. If the aims are not being achieved, then changes to the management regime will be required. It is not the aim of this technical note to provide a detailed description of monitoring methods, but there is a wide range to choose from, depending on the aims of management. For sites where tree and shrub regeneration is to be encouraged (or prevented) as an aim of management, measuring the number or density of regenerating trees is a relatively simple feature to monitor. In grassland or wetland habitats, monitoring may focus on vegetation structure (sward height, leaf litter) or species diversity (detailed quadrat counts). If the management is aimed at providing ideal conditions for another species (e.g. wading birds) it may be appropriate to monitor them directly.

Further Reading:

- Andrews, J & Rebane, M (1994)
Farming & Wildlife – A Practical Management Handbook
RSPB
- Crofts, A & Jefferson, R G (1999)
The Lowland Grassland Management Handbook
English Nature
<http://www.english-nature.org.uk/pubs/Handbooks/default.asp>
- Harris, R.A. & Jones, M (1998)
The Nature of Grazing – Farming with Flowers at Loft and the Hill of White Hamars
SNH/SWT
- Stewart, F E & Eno, S G (1998)
Grazing Management Planning for Upland Natura 2000 Sites: A Practical Manual
NTS

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