

### 3 LOWLAND GRASSLANDS

#### 1 Introduction

1.1 Lowland grasslands are almost everywhere the product of human activity, having been created by forest clearance and wetland drainage to provide fodder for domestic stock. Grazing, manuring, treading and cutting for hay have been important factors in both their creation and their maintenance. The sward usually contains a mixture of grasses and dicotyledonous herbs (forbs) mainly derived from the woodland field layer, from open habitats or from the drier edges of fens and marshes. The important factor is that these grasslands have the status of ancient semi-natural communities composed largely of native species. Some grassland species are ubiquitous, but many have more specific ecological requirements and geographical distributions, so that types of soil, both physical and chemical, together with soil hydrology and location within Britain, play a major role in influencing sward composition. Lowland grasslands are of three main kinds.

##### 1.1.1 Meadows or neutral grasslands

These are mostly within enclosed field systems on soils with pH 5.0-7.0. Individual areas are often of only a few hectares and seldom exceed 20 ha. Taken together they once covered a large total area of Britain as meadowlands. They were mainly used for grazing, but a proportion would be 'shut up' and cut for hay to provide winter feed. Where a hay crop was taken, early spring grazing prior to shutting up for hay was practised in the north, with aftermath grazing rather than the spring grazing which was more common in the south. When ungrazed, the swards usually develop into tall growths containing an abundance of conspicuous flowers.

##### 1.1.2 Calcicolous grasslands

These are mainly unenclosed grassland areas of the chalk and limestone formations, on shallower soils, often of rendzina type, and with pH 6.5-8.5, usually containing free lime. They were traditionally grazed by sheep and occasionally by cattle, which produced a close-cropped sward rich in forbs. Calcicolous grasslands belong especially to undulating hill country, with drier and shallower soils than the meadow grasslands and arable land of the valleys and plains. Formerly they often occurred as large expanses, little divided by hedges or fences, wherever the calcareous formations appeared at the ground surface. Calcicolous grasslands are floristically rich and form an important habitat for butterflies and other invertebrates.

##### 1.1.3 Calcifugous grasslands

These occur on non-calcareous substrata, tending to podsollic type, with pH below 5.0. They seldom occur in large areas in isolation and are usually associated with the dwarf shrub communities of the acidic lowland heaths (see C.4). Usually they have been derived from acidic lowland heath through periods of relatively heavy grazing.

1.2 In the uplands of the north and west, the meadow grasslands of the hill farms tend to be of a distinctive type, which has clear affinities with the herbaceous vegetation of ungrazed hill woods and cliff-ledges. Their occurrences are nevertheless nearly all circumscribed by field boundaries.

In the case of calcicolous and acidic grasslands, there are gradual transitions in the north and west to sub-montane and then montane types (see C.9), and these gradations are continuous on the ground wherever open hill pasture rises to a sufficient elevation.

- 1.3 The lowland grasslands were described in Chapter 6 of Volume 1 of the NCR, but the NVC (Rodwell 1982, 1985, 1989) has now provided a more definitive classification (Table 9).
- 1.4 The ancient semi-natural lowland grasslands have been a particular focus for the processes of agricultural intensification that have been so marked during the last 50 years. They have lost ground enormously during this period, though it is impossible to provide accurate figures. The meadow grasslands have largely been converted to more uniform, species-poor, high-production swards. Many have been ploughed, treated with herbicides, heavily fertilised and reseeded with monocultures of commercial rye-grass. These have no more wildlife interest than fields of cereals. Others, through one or more of these treatments or simply through heavy grazing and manuring, have more slowly been converted to pastures dominated by a few grass species, with few remaining forbs. The floristically rich pastures have survived largely by chance and usually as isolated fields or small groups of fields in the possession of elderly farmers. In most counties, meadow grassland with significant botanical interest now occupies no more than 3% of the total, and even these remnants continue to dwindle. Before long, the only surviving examples will be those under deliberate conservation management. It is thus imperative to notify as SSSIs as many as possible of the good examples which remain.
- 1.5 The calcicolous grasslands have been subjected to the same processes of agricultural improvement. Often this has been accompanied by enclosure, so that open downland has been extensively converted into field systems occupied either by high-production grassland or by arable. Even where unenclosed grassland remains, it has deteriorated in nature conservation value, often seriously. Where grazing has been maintained, soil fertility has usually been increased either by addition of fertiliser or through the effects of manuring by increased stocking, so that grasses have again tended to oust the forbs. In many places, however, it has become uneconomic to graze sheep or cattle on the remaining open downs and they have been withdrawn from grazing. There has thus been either reclamation or abandonment.
- 1.6 Since myxomatosis, there have been few rabbits to maintain alternative grazing, so these biotic communities have become subject to natural processes of plant succession. First, robust and vigorous grasses tend to assume dominance, suppressing or reducing the smaller herbs. Then, sooner or later, species of tall shrub, which are often present on the downs and always within close reach, begin to invade and develop dense growths of scrub. In limited amounts and at an intermediate stage, scrub characteristic of calcicolous grassland (chiefly W21d of Rodwell 1986) is an important habitat in its own right. But it is a dynamic seral community which changes rapidly to dense, closed thicket and is itself eventually replaced by taller woodland if it is not carefully controlled and managed. Many downlands have been largely scrubbed over, to the point of losing most of their original wildlife interest.
- 1.7 Loss and deterioration of calcicolous grasslands continue, and, although much larger areas remain than of meadow grasslands, they tend to be highly fragmented and often occur as relics on steep scarp slopes within intensively

farmed landscapes. It is estimated that, of the calcicolous grasslands existing on the Cretaceous chalk and Jurassic limestone 50 years ago, barely 20% now remain unmodified. The identification and selection of the best remaining areas not already notified as SSSIs is thus a matter of some urgency.

## 2 International importance

Many of the NVC lowland grassland communities have analogues in continental Europe and some have even closer affinities in Ireland. Most of them are, nevertheless, distinctively British in their detailed floristics, and a few of the sub-communities are not close to any other described types. This range of grasslands has also lost much ground on the continent and continues to do so, through the same processes of agricultural improvement that have caused its extensive modification in Britain. Semi-natural lowland grasslands thus represent internationally threatened habitats which are likely to become still rarer.

## 3 Selection requirements

- 3.1 Botanical evaluation of grasslands should be according to detailed floristics of the NVC communities (summarised in Table 9). Most grasslands have been altered to some extent over the past 50 years, and the degree of modification is reflected in the loss of certain species from the sward. The NVC communities MG1, 6, 7, 9 and 10 are considerably modified types with generally low botanical interest. These should not be used as the basis for SSSI selection unless they have rare plant species or special faunal interest. (MG9 and MG10 may do so, in particular.) They can, however, be included within an SSSI where they form a mosaic with more important communities or a peripheral zone between the higher-quality habitat and a clearly defined boundary.
- 3.2 The addition of fertilisers and/or herbicides to the unmodified communities leads eventually to MG6. The speed and degree of change depend largely on the rate of chemical input together with the frequency and length of time of the applications. Thus the cut-off point between MG6 and its precursors is often blurred. Similarly a continuation of chemical treatments, particularly nitrogen and phosphates, will push MG6 to MG7. Thus MG6 is an NVC type which at one extreme borders on SSSI quality and at the other extreme on MG7, which clearly has very little botanical interest.
- 3.3 Only those areas containing good examples of the NVC lowland grassland communities in Table 9 will qualify for SSSI selection on floristic merits. Quality of botanical composition is determined by reference to the NVC's floristic tables (Rodwell 1982, 1985, 1989). These divide species into three groups within each community. The first two groups are important for SSSI selection, the third group being those species which are infrequent or casual in that community. The first group comprises the community constants and is a diagnostic combination which identifies that community and provides a first sift in the assessment of quality. The second group comprises those species particularly used to differentiate between sub-communities. These 'character' species can help to determine whether a stand of an identified community is up to SSSI standard.
- 3.4 The NVC is a **national** classification and it 'lumps' rather than 'splits' vegetation types. Many of the communities occur over a wide geographical range. This means that those species with a restricted geographical distribution will naturally be absent in certain areas covered by that

community. Combinations and patterns of regional presence and absence are, indeed, one basis for the separation of distinctive sub-communities.

- 3.5 Examples of grassland with any of the communities listed in Table 9, either singly or in mixtures, should be at least 0.5 ha in area to qualify for selection. The selection should include the best examples of each grassland sub-community within an AOS and all combinations of different sub-communities in addition to pure stands. The best examples will usually be the largest stands, but floristic quality by comparison with the type will also contribute to the assessment. Any single community of MG grassland in Table 9 of 5 ha or more or any mixture of types of 10 ha or more should be selected. For CG grasslands in Table 9 the same applies to areas of 10 ha for single communities and 20 ha for mixtures. For U1-3, any unmixed stand of 5 ha or more or any area of mixed grassland and heathland of 10 ha or more should be selected.
- 3.6 The nature of lowland grasslands, and especially meadow grasslands, is such that adequate representation in the SSSI series tends to involve a large number of small sites. Many of the remaining good meadow grasslands are individual fields which have chanced to escape improvement. Some communities are now so rare that the inclusion of **all** remaining examples is still an unsatisfactory and inadequate representation. This is especially the case in regard to the minimal area for viability of populations of uncommon invertebrates and to the need for a network of locations to allow possibilities of interchange by migration of mobile species, for example the marsh fritillary and the Lycaenid butterflies.
- 3.7 Within the meadow grasslands, where extensive areas of any one type are rare, large single-type stands will tend to be more highly valued than equivalent areas of mixed types. On the whole, however, diversity of types is more highly valued than uniformity within the calcicolous grasslands, which tend to be more extensive than meadow grasslands. Total floristic diversity (species number) within a site cannot be used uncritically as a measure of value, because it may include casual and invasive species whose presence is an indication of recent disturbance and deterioration in botanical quality. Care is needed even over the use of 'character' or 'indicator' species, especially in the form of lists without abundance estimates. The presence of several uncommon species may appear impressive in a list, but there is a big difference between the occurrence of a few individuals and large populations. Historical data on a site may add to its value by giving relevant insight into the management requirements of the particular grassland type.
- 3.8 Lowland calcifugous grasslands often occur in association with acidic dwarf shrub heath (see C.4). Stands of particular importance occur in the Breckland and the Scottish Borders.
- 3.9 The remaining types of calcicolous grassland (CG11-14) and of calcifugous grassland (U4-7 and U13) are all sub-montane or montane types (see C.9, Table 22). Fen-meadows are treated in the chapter on Fens (C.7, 6).

#### 4 References and relevant literature

- DUFFEY, E., MORRIS, M.G., SHEAIL, J., WARD, L.K., WELLS, D.A., & WELLS, T.C.E. 1974. Grassland ecology and wildlife management. London, Chapman and Hall.

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Table 9 National Vegetation Classification - lowland grassland communities

a) Distribution of grassland communities of high botanical interest

- MG2 Filipendula ulmaria - Arrhenatherum elatius  
Confined to northern England. Of the characteristic species, Geum rivale is less frequent in southern Britain. Cruciata laevipes is less frequent in N & W Scotland, W Wales and SW England.
- MG3 Anthoxanthum odoratum - Geranium sylvaticum  
Valley grasslands and river banks of northern Britain; often used as hay meadows. Geranium sylvaticum occurs in northern Britain. Sanguisorba officinalis occurs in N and central S England and S Wales but is rare in Scotland. Favoured by hay management.
- MG4 Alopecurus pratensis - Sanguisorba officinalis  
Can be regarded as southern counterpart of MG3. Sanguisorba officinalis: see MG3.
- MG5 Cynosurus cristatus - Centaurea nigra  
Occurs throughout the British lowlands. The community covers a wide range of soil types and the sub-communities reflect this. The Galium verum sub-community shows affinities with some CG grasslands and the Danthonia sub-community with acid grasslands. In addition, certain local species, e.g. Oenanthe pimpinelloides (SW England), occur in this community and may warrant sub-community rank.  
  
The botanical interest lies not in the characteristic species but in the many species of high conservation value found in this community.
- MG8 Cynosurus cristatus - Caltha palustris  
Widespread but rather local distribution throughout lowland Britain. Its most frequent occurrence is as a zonation community. Carex panicea and/or C. disticha should be present.
- MG11 Festuca rubra - Agrostis stolonifera - Potentilla anserina  
Characteristic of lowland areas frequently inundated with fresh or brackish water. Often used as pasture in the upper saltmarshes (see C.1, Table 2a).
- MG12 Festuca arundinacea  
Exclusively a coastal community in estuaries and saltmarshes in the south and west of Britain and on clay cliffs in Dorset, Kent and North Yorkshire (see C.1, Table 2a).
- MG13 Agrostis stolonifera - Alopecurus geniculatus  
Widely distributed in lowland areas. In eastern England it forms extensive stands but elsewhere it is fragmentary alongside watercourses and on the edges of ponds. Also occurs in freshwater transitions of upper saltmarshes (see C.1, Table 2a).

This community has special value in providing feeding areas for wildfowl.

CG1 Festuca ovina - Carlina vulgaris

Distribution limited to scattered sites on harder limestones around southern and western coasts of England and Wales.

CG2 Festuca ovina - Avenula pratensis

Widely distributed over southern lowland calcareous formations, with regional differences showing up as sub-communities.

CG3 Bromus erectus

Distribution follows that of the species and so this community is especially frequent over the Chalk, Oolite and Magnesian Limestone.

CG4 Brachypodium pinnatum

Frequent on the Oolite; also Yorkshire Wolds and North and South Downs.

CG5 Bromus erectus - Brachypodium pinnatum

Distribution is centred on the Oolite.

CG6 Avenula pubescens

Occurs in scattered localities over a variety of lowland limestone areas but is nowhere extensive, being a product of little or no grazing of grasslands over moist, mesotrophic calcareous soils on flat or gently-sloping sites. Most of these areas have been converted to arable.

This community should normally be considered as a bonus to a site selected for another community.

CG7 Festuca ovina - Hieracium pilosella - Thymus praecox

Scattered localities in Wiltshire, the Yorkshire Wolds, the Carboniferous Limestone of Derbyshire and the Mendips, with its greatest concentration and extent in Breckland.

CG8 Sesleria albicans - Scabiosa columbaria

Distribution is confined to Magnesian Limestone in Durham.

CG9 Sesleria albicans - Galium sternerii

Distribution is confined to the Carboniferous Limestone of Northern England, with the sub-communities marking regional differences.

CG10 Festuca ovina - Agrostis capillaris - Thymus praecox

The community occurs in scattered localities throughout northern Britain, always reflecting the distribution of more calcareous rocks and soils.

U1 Festuca ovina - Agrostis capillaris - Rumex acetosella

These very diverse and open swards occur widely on light soils over the drier areas of lowland Britain.

U2 Deschampsia flexuosa

These swards are of local distribution on wetter but free-draining, base-poor soils in lowland Britain.

U3 Agrostis curtisii

A community based on the abundance of Agrostis curtisii and therefore confined to the south-west.

**b) Distribution of grassland communities of lower botanical interest**

MG1 Arrhenatherum elatius coarse grassland

An unmanaged grassland occurring throughout the British lowlands on road verges and railway embankments and in neglected agricultural and industrial habitats.

MG6 Lolium perenne - Cynosurus cristatus pasture

The major permanent pasture type in lowland Britain, often brought about by the action of fertilisers, herbicides and drainage on many other MG types or by agricultural rundown of MG7.

MG7 Lolium perenne leys

The major and ubiquitous sown grassland type in Britain.

MG9 Holcus lanatus - Deschampsia cespitosa

This is highly characteristic of permanently moist soils throughout the British lowlands.

MG10 Holcus lanatus - Juncus effusus

This is ubiquitous throughout the British lowlands, commonly developing by invasion of Juncus into MG6 and MG7 where drainage becomes impeded.