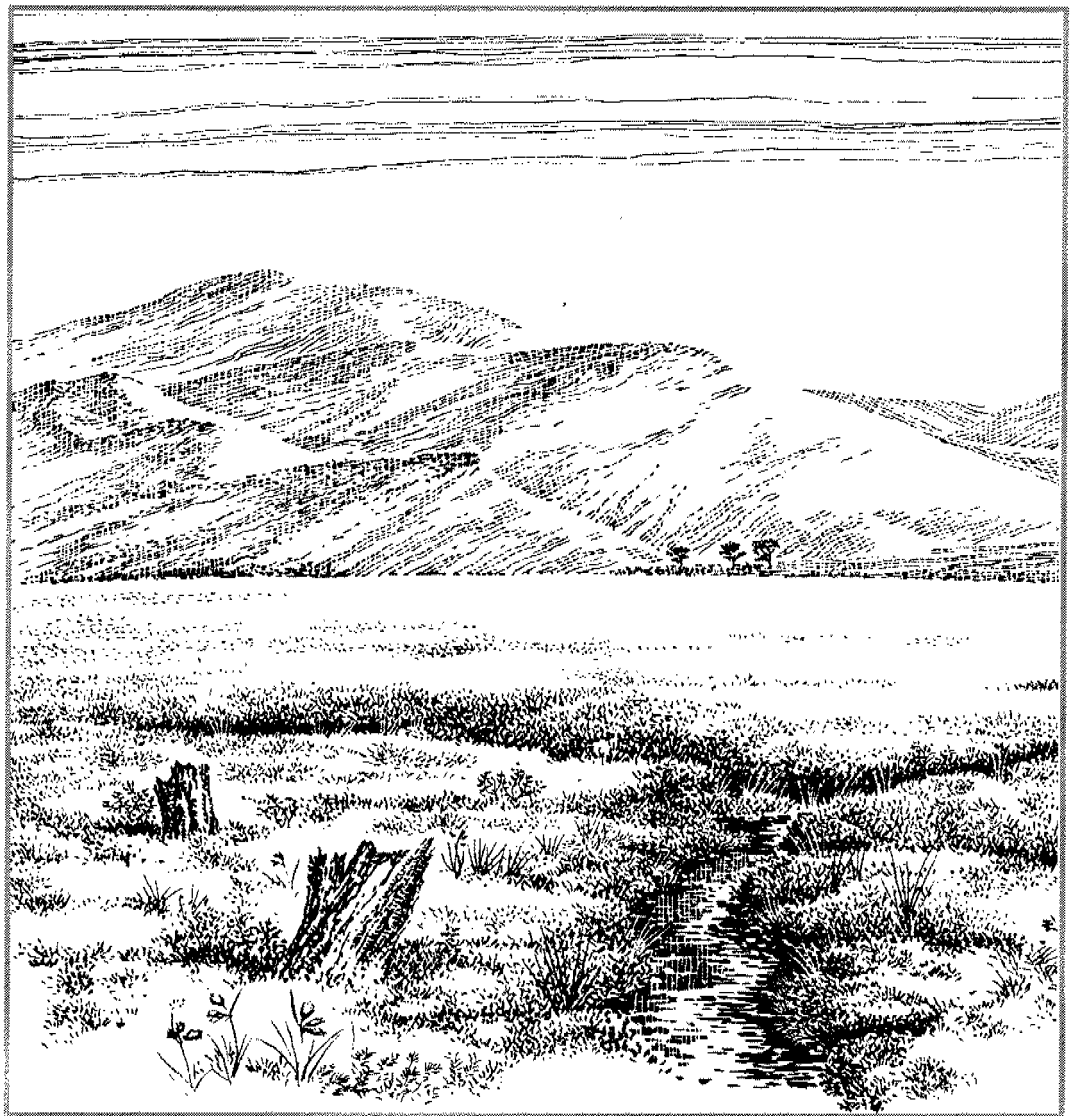


# The vegetation of the mountains and moorlands of England

National assessment of significance

**No. 218 - English Nature Research Reports**



working today  
for nature tomorrow

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Number 218

**The Vegetation of the mountains  
and moorlands of England**

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### Part 1

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### Appendices

- Appendix 1: Upland NVC communities in England
- Appendix 2: Rare and nationally scarce species in the English uplands
- Appendix 3: Revised map showing upland Natural Areas

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## 1. Introduction

The concept of dividing England into Natural Areas based on ecological and topographical features has been developed within English Nature. A Natural Areas map has been produced outlining the boundaries of 118 characteristic areas which inspire a sense of place and are recognisable to those who live and work within them. Eighteen Natural Areas with an upland character (whose boundaries lie predominantly within or are equivalent to the Less Favoured Area boundary) have been identified by English Nature and are shown in figure 1. These Natural Areas are the framework within which English Nature's upland work will be delivered. English Nature is producing a *core* profile for each Natural Area, describing key nature conservation features and issues, and *full* profiles which will include nature conservation objectives.

English Nature has also worked with the Countryside Commission and English Heritage to produce a Joint Character Map which describes conservation, landscape and cultural interests. The revised map has not had a significant effect on the location of the majority of the upland Natural Areas. The revised map showing the upland Natural Areas is shown in Appendix 3.

The purpose of this report is to provide a national overview of the vegetation found within the mountain and moorlands of England. It describes each habitat, provides a summary of national status and European significance for each vegetation community, identifies key issues and suggests broad objectives. This report forms part of a series of overview reports covering habitats ( eg grasslands (Jefferson, 1996)), species (eg birds (Grice et al., 1994)) and Earth Heritage features (King et al, 1996). These will integrate locally-generated core profiles with national priorities.

## 2. Methodology

### 2.1 Upland Natural Areas

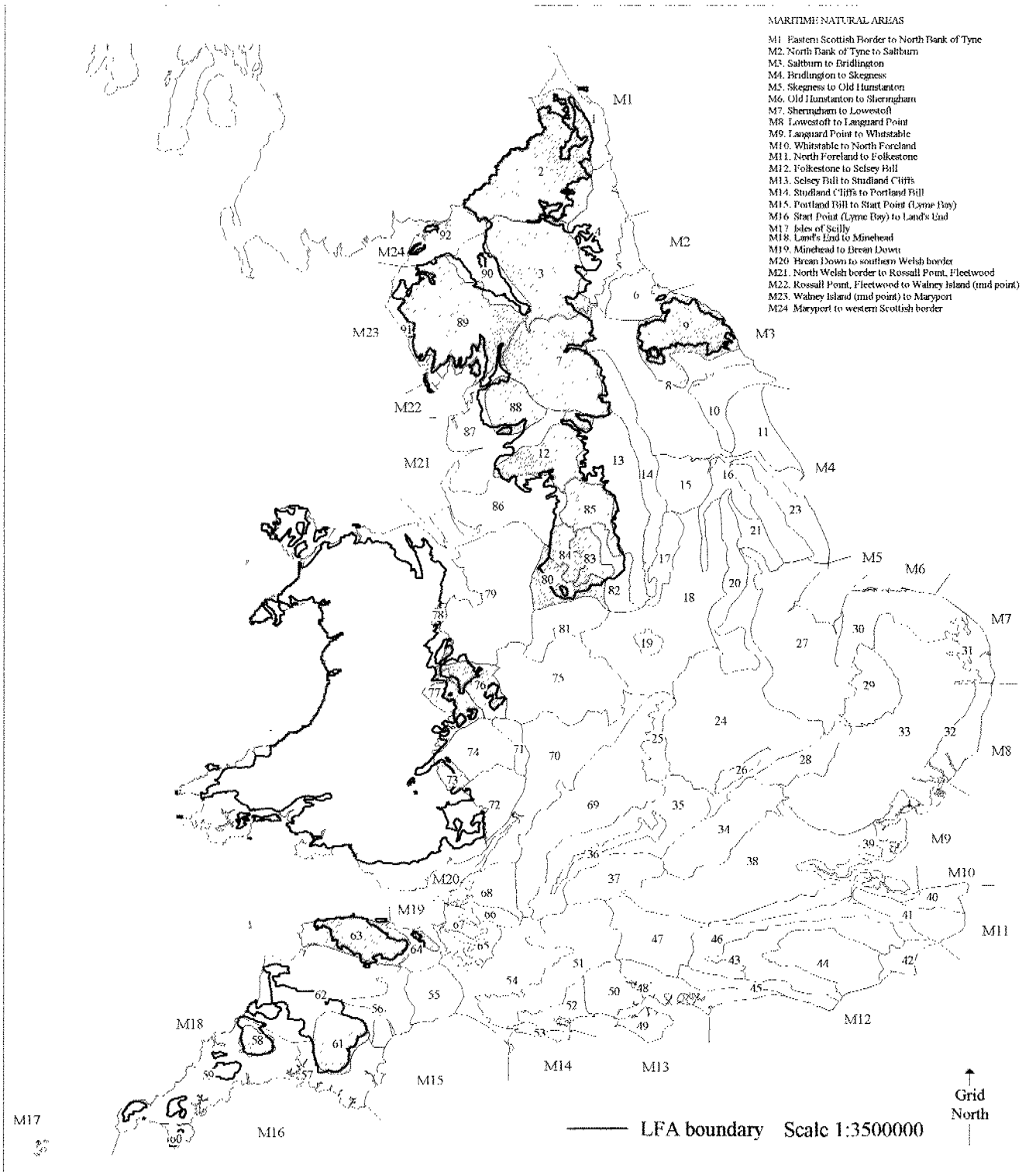
Eighteen upland Natural Areas have been identified (Figure 1):

Bodmin Moor	North York Moors
Border Uplands	North Pennines
Black Mountains and Golden Valley	Oswestry Uplands
Central Marches	Shropshire Hills
Cumbrian Fells and Dales	Southern Pennines
Dark Peak	SouthWest Peak
Dartmoor	Staffordshire Uplands
Exmoor and the Quantocks	White Peak
Forest of Bowland	Yorkshire Dales

This report outlines the interest of the following semi-natural vegetation found above the "moor" or "fell" wall: montane, upland heath, mires, grasslands, rock faces and scree, limestone pavement and scrub. Appendix 1 gives a list of all the NVC communities recorded in these habitats.

Figure 1

Upland Natural Areas



- |                                 |                                       |                                  |                                |                       |                                   |
|---------------------------------|---------------------------------------|----------------------------------|--------------------------------|-----------------------|-----------------------------------|
| 1. Northumberland Coastal Plain | 11. Plain of Holderness               | 21. Lincolnshire Clay Vales      | 31. Broadland                  | 41. North Downs       | 51. South Wessex Downs            |
| 2. Border Uplands               | 12. Southern Pennines                 | 22. Lincolnshire Wolds           | 32. Suffolk Coast and Heaths   | 42. Romney Marsh      | 52. Dorset Heaths                 |
| 3. North Pennines               | 13. Coal Measures                     | 23. Lincolnshire Marsh and Coast | 33. East Anglian Plains        | 43. Low Weald         | 53. Isles of Portland and Purbeck |
| 4. Northumbrian Coast Measures  | 14. Southern Magnesian Limestone      | 24. Middle Fingland              | 34. Chilterns                  | 44. High Weald        | 54. Wessex Vales                  |
| 5. Durham Magnesian Limestone   | 15. Humberhead Levels                 | 25. Northamptonshire Uplands     | 35. Oxford Clay Vales          | 45. South Downs       | 55. Blackdowns                    |
| 6. Lower Tees                   | 16. Coversands                        | 26. Bedfordshire Greensand       | 36. Oxford Heights             | 46. Greensand         | 56. Devon Redland                 |
| 7. Yorkshire Dales              | 17. Sherwood Forest                   | 27. Fenland                      | 37. Wessex Downs               | 47. Hampshire Chalk   | 57. South Devon                   |
| 8. The Vales of Yorkshire       | 18. Trent Valley and Levels           | 28. East Anglian Southern Chalk  | 38. London Basin               | 48. South Coast Plain | 58. Bodmin Moor                   |
| 9. North York Moors             | 19. Charnwood Forest                  | 29. Breckland                    | 39. Thames Marshes             | 49. Isle of Wight     | 59. Cornish Killas and Granite    |
| 10. Yorkshire Wolds             | 20. Lincolnshire Limestone            | 30. North Norfolk                | 40. North Kent Plain           | 50. New Forest        | 60. The Lizard                    |
| 61. Dartmoor                    | 71. Malvern Hills and Teise Valley    | 81. Upper Trent Valley           | 91. West Cumbria Coastal Plain |                       |                                   |
| 62. Cotswolds                   | 72. Deau Plateau and Wye Valley       | 82. The Derwent Valley           | 92. Solway Basin               |                       |                                   |
| 63. Exmoor and the Quantocks    | 73. Black Mountains and Golden Valley | 83. White Peak                   |                                |                       |                                   |
| 64. Vale of Taunton             | 74. Hereford Plain                    | 84. South West Peak              |                                |                       |                                   |
| 65. Mid Somerset Hills          | 75. Midlands Plateau                  | 85. Dark Peak                    |                                |                       |                                   |
| 66. Mendips                     | 76. Shropshire Hills                  | 86. Urban Mersey Basin           |                                |                       |                                   |
| 67. Somerset Levels and Moors   | 77. Central Marches                   | 87. Lancashire Plain and Valley  |                                |                       |                                   |
| 68. Avon Ridges and Valleys     | 78. Oswestry Uplands                  | 88. Forest of Bowland            |                                |                       |                                   |
| 69. Greater Cotswolds           | 79. Mosses and Meres                  | 89. Cumbrian Fells and Dales     |                                |                       |                                   |
| 70. Severn Valley               | 80. Staffordshire Uplands             | 90. Eden Valley                  |                                |                       |                                   |

Part 1 of the report provides a summary account of all the mountain and moorland NVC communities known to occur in the upland Natural Areas. Each section gives a brief description of the broad habitat category followed by descriptions for each NVC community. These are very abbreviated accounts and are intended as a quick guide to the characteristic features of NVC communities, including species composition, habitat requirements and known distribution. There is also a section on the conservation status of each broad habitat category in the European context. This includes, where relevant, references to habitats and communities under the EC Directive on the Conservation of Natural and Semi-natural Habitat and of Wild Fauna and Flora (Directive 92/43/EEC) and the UK Biodiversity Action Plan.

## 2.2 Natural Area Proforma

Part 2 of the report contains the proformas for the eighteen upland Natural Areas. Each proforma contains the following information:

**Name** of the Natural Area (boundaries are presented in Figure 1).

### **Mountain and Moorland Significance**

This depends on the occurrence and extent of internationally and nationally important NVC communities within each Natural Area. It is important to emphasise that the significance criteria do not include an assessment of habitat condition. The levels of significance and the criteria are shown in Table 1.

### **Description**

A brief description is given of the major physiographical and landscape features of each Natural Area along with a general account of the broad habitat types that are present.

### **Key Habitat Types**

National Vegetation Communities present in each Natural Area have been listed by habitat. Those communities for which there is no survey information and which require confirmation of their presence within a Natural Area are shown in bold. *Extent* is indicated by three categories, fragmented, frequent or extensive. *Significance* is based on national and international importance using the following guidelines:

- I - absent or scarce outside the UK
- UK - found elsewhere in Europe but especially well developed in the UK
- L - widely found in similar form in Europe

### **Nationally Rare and Scarce Plant Species**

Nationally rare and scarce plant species are listed using scientific names. This list is restricted to those species largely found in open mountain and moorland habitats. Thus it does not include, for example, species of enclosed grasslands or woodlands. Plant

species that are strictly restricted to mountain and moorland habitats are listed first. Those species largely found associated with mountain and moorlands but also found elsewhere are listed in brackets. Biodiversity Action Plan species are indicated with an asterisk. The full list of rare and scarce upland species along with common names and their known distribution throughout the Natural Areas is given in Appendix 2.

### **Key Issues**

These are the issues which are considered to have the greatest impact on land management and enhancement for each habitat type. They are derived from the Natural Area core profiles, author knowledge and Local Team experience.

### **Key Objectives**

Objectives are derived from national priorities for each habitat. These are derived from analysis of the significance, distribution, extent and, where known, the management of habitats within each Natural Area. Appropriate mechanisms to achieve objectives are not identified.

### **Overall Significance**

The final section summarises the overall significance of the Natural Area in terms of its representation of nationally and internationally important vegetation types and the presence of rare or nationally scarce vascular plants. It is important to note that this does not take habitat condition into consideration.

## 2.3 Sources of Information

The mountain and moorland overviews were compiled from a variety of information sources, published material and databases:

- *National Vegetation Classification* (Rodwell, 1991,1992)
- National Moorland NVC database
- *Scarce Plants Atlas and Red Data Book* (Stewart, Pearman and Preston 1994, Perring and Farrell, 1983)
- SSSI Schedules
- Author knowledge
- Local Team surveys
- Information used to score *International Significance* were prepared following discussions and information provided by David Horsfield and Des Thompson, Scottish Natural Heritage and Marcus Yeo, Countryside Council for Wales and John Birks, University of Bergen.
- Local Team *Core Profiles*



### 3. Results

Table 1 presents the significance ratings for the upland Natural Areas along with the criteria used to determine significance. The criteria require the frequent or extensive presence of vegetation communities that are either rare or absent outside the UK. Two communities (U6 and U20) have been excluded from this process as, although rare outside the UK, they are not considered to be of particular nature conservation interest. The Oswestry Uplands and the White Peak Natural Areas both have negligible significance in terms of the most important upland NVC communities although they do hold other, more widely distributed types.

Table 1: Significance ratings for upland Natural Areas and criteria

	<b>Number of communities found only in the UK or rare elsewhere</b>	<b>Natural Areas with at least frequent representation of communities</b>
<b>Outstanding</b>	at least 10	Cumbrian Fells and Dales North Pennines Yorkshire Dales Dartmoor
<b>Considerable</b>	at least 7	Exmoor and the Quantocks Border Uplands North York Moors Forest of Bowland Southern Pennines Staffordshire Uplands
<b>Notable</b>	at least 5	Bodmin Moor South West Peak Black Mountains and Golden Valley
<b>Some</b>	at least 1	Shropshire Hills Dark Peak Central Marches
<b>Negligible</b>	none	White Peak Oswestry Uplands

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## **Part 1**

### **Description and status of the vegetation of the mountains and moorlands of England**

## 5. Montane communities

### 5.1 Description

The montane zone is found above the altitude at which trees occur naturally (the tree-line). In England this is generally found at about 600 metres, depending on local variations in temperature, shelter and humidity. The altitudinal zonation of mountain vegetation is a result of a decrease in temperature and an increase in wind speed and snow cover with increasing height above sea level. Montane vegetation communities are generally climax types and, as such, require minimal management. The diverse vegetation found at high altitudes includes prostrate dwarf-shrub heath, moss and lichen heath, grassland, upland herb and fern communities and low growing juniper and willow scrub.

In England, montane habitats are found in the Cumbrian Fells and Dales, the Border Uplands, Yorkshire Dales and the North Pennines. These Natural Areas are significant because, along with examples in North Wales, they are southern outliers of vegetation communities whose representation in the UK is almost solely in Scotland. The following communities occur in the montane zone in England.

#### H13 *Calluna vulgaris*-*Cladonia arbuscula* heath

Stands of this community have a grey or yellowish hue from a distance due to the abundance of lichens found in a mosaic with climatically suppressed dwarf shrubs. The dwarf shrub mat, generally between 5 - 8 centimetres in depth, varies in cover depending on wind and frost exposure. This community occurs largely in northern Scotland and, in England, it is restricted to the Cumbrian Fells and Dales.

#### H18 *Vaccinium myrtillus* - *Deschampsia flexuosa* heath

See upland heath section.

#### H19 *V. myrtillus*-*Cladonia arbuscula* heath.

This consists essentially of a very low mat of dwarf shrubs with an abundance of lichens. It is typical of base-poor soils on what are usually moderately sheltered and snow-bound slopes at high altitudes. Overall, the vegetation is a climatic climax and it occurs mostly over 650 metres. At such levels the climate is generally harsh, and this is reflected in the strongly montane character of the vegetation with a number of Arctic-alpine plant species present. In Cumbria, this community was found to occur on more steeply sloping ground below the mountain summits (Jerram 1992). This community is confined to the highest peaks of the Cumbrian Fells and Dales, the Border Uplands, the North Pennines and the Yorkshire Dales.

#### H22 *Vaccinium myrtillus*-*Rubus chamaemorus* heath

This community has a mixed cover of dwarf shrubs overlying a moist, bryophyte carpet. Heather (*Calluna vulgaris*) varies in cover depending on sub-community and bilberry (*Vaccinium myrtillus*) usually has the greater cover of the two. Wavy hair grass (*Deschampsia flexuosa*) and cloudberry (*Rubus chamaemorus*) occur infrequently. Generally, this community is found at high altitudes in the central

and north-west highlands, although similar types have been recorded at high altitudes in the Border Uplands.

- M7 *Carex curta-Sphagnum russowii* mire  
Characterised by the presence of white sedge (*C. curta*), which is often abundant, this community is confined to high altitude acidic flushes. It is mostly restricted to the highlands of Scotland with outliers on Moor House in Cumbria and Widdybank Fell in Durham (Rodwell et al, 1992).
- M8 *Carex rostrata-Sphagnum warnstorffii* mire  
This mire has a dominant cover of sedges over an extensive carpet of base-tolerant *Sphagna* and a fairly numerous and diverse assemblage of herbs. It is generally confined to altitudes between 400 and 800 metres in Scotland with a southern outlier in the North Pennines.
- M31 *Anthelia julacea-Sphagnum auriculatum* spring.  
*Anthelia julacea* is a fine but conspicuous liverwort found in tufts, cushions and carpets. This community is species poor with small amounts of vascular plants, the commonest being tufted hair-grass (*Deschampsia cespitosa*). This community is found in the north-west of Britain, over permanently wet skeletal mineral or organic soils and in England occurs only in the Cumbrian Fells and Dales.
- M32 *Philonotis fontana-Saxifraga stellaris* spring.  
These are springs, flushes and rills of striking appearance due to the dominant bright green moss *Philonotis fontana*. This is one of the most common and widespread types of spring vegetation in the uplands of north-west Britain. It generally occurs above 450 metres in the Border Uplands, Bowland Fells, North Pennines, Yorkshire Dales and, most abundantly, in the Cumbrian Fells and Dales.
- U7 *Nardus stricta-Carex bigelowii* grass heath.  
This is generally dominated by mat-grass (*Nardus stricta*) and is characteristically a short, closed sward. It includes varying amounts of stiff-sedge (*Carex bigelowii*), woolly hair moss (*Racomitrium lanuginosum*) and other bryophytes, lichens, heath bedstraw (*Galium saxatile*) and bilberry. It is a community of snow-bound slopes at higher altitudes, occurring over gentler ground that is irrigated by rain and melt-water. It occurs mainly above 600 metres and Arctic-alpine plants, well adapted to such conditions, are characteristic of this community. In England it is restricted to the Cumbrian Fells and Dales, North Pennines and Yorkshire Dales.
- U10 *C. bigelowii-R. lanuginosum* moss heath.  
The stiff sedge (*C. bigelowii*) - woolly hair moss heath includes both continuous carpets of mossy heath and more open vegetation. Closed swards often form a thick mat, but there is a gradation through more patchy carpets on rocky ground to stony surfaces on which small clumps of woolly hair moss are virtually the only cover. Grasses, bilberry, lichens and mosses are common and the community is characteristic of windswept, cloud-ridden plateaux at moderate to very high

altitudes. This community is largely restricted to the Scottish Highlands with outliers in the Cumbrian Fells and Dales, the Border Uplands and North Pennines. In Cumbria this community was found to occur on the summit plateaus (Jerram 1992).

U13 *Deschampsia cespitosa-Galium saxatile* grassland

This community is largely dominated by grasses, especially tufted hair-grass (*Deschampsia cespitosa*) and mosses. It occurs at high altitude on wet slopes which have long periods of snow-lie. It is mostly confined to Scotland with outlying examples in the Cumbrian Fells and Dales.

U15 *Saxifraga aizoides-Alchemilla glabra* banks.

This vegetation occurs on steep, rocky or earth slopes and typically forms a dripping, wet carpet of plants in which yellow saxifrage (*Saxifraga aizoides*) is generally abundant. Grasses, sedges, mosses and a variety of small herbs add to the luxuriant growth of this community. It provides an important locality for some rare Arctic-alpine plants restricted to high ground in Britain. The community is confined to steep, continuously irrigated, calcareous cliff faces and banks at moderate to high altitudes; mostly between 300 - 800 metres. It is largely restricted to Northern Scotland with relict fragments in Cumbrian Fells and Dales.

U17 *Luzula sylvatica-Geum rivale* tall herb community

A species-rich assemblage of plants, this community is luxuriant in appearance where the taller and bulkier herbs predominate. When on rock ledges and crags it has been likened to "hanging gardens". Woodrush is constant in this very variable community and, in this situation, is large and usually flowers profusely. This community depends on protection from grazing and burning and base-enrichment from calcareous rocks or water flushing from them. Its main area of distribution is in Scotland but there are outliers of this community in the southern uplands and in the Cumbrian Fells and Dales.

CG11 *Festuca ovina-Agrostis capillaris-Alchemilla alpina* grass heath

This calcareous grass-heath community is dominated by Alpine lady's mantle (*Alchemilla alpina*) and grasses. Other common species include tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), thyme (*Thymus praecox*) and bilberry. It is most typical of free-draining, though often moist, brown earths of moderate base status developed over calcareous bedrocks in a generally montane climate.

CG14 *Dryas octopetala-Silene acaulis* ledge community

This community is confined to ungrazed calcareous crags and ledges and often has abundant mountain avens (*Dryas octopetala*), along with dwarf shrubs, tall herbs, sedges, grasses and bryophytes. Its centre of distribution is the Scottish Highlands and, in England, there are outlying fragmentary stands in the Cumbrian Fells and Dales.

## 5.2 Status

The British montane zone is of international significance by virtue of there being a good representation of Arctic-alpine species and communities at the southern most end of their range and due to the presence of local ecotypes. See table 2 for the international importance of montane NVC communities in England. The international importance of this habitat has been recognised by:

- a) The EC Directive on the Conservation of Natural and Semi-natural Habitat and of Wild Fauna and Flora (Directive 92/43/EEC). This lists alpine and sub-alpine heaths, siliceous alpine and boreal grassland, alpine calcareous grassland, eutrophic tall herbs and alpine pioneer formations of *Caricion bicoloris-atrofuscae*.
- b) The United Nations Conference on Environment and Development Convention on Biological Diversity was ratified by the UK Government which published the UK Biodiversity Action Plan in 1994. The production of a montane habitat statement will be followed by a costed action plan.

Table 2: International importance of montane NVC communities occurring in England (Birks, pers comm.)

NVC code	Community name	Only found in the UK or Ireland or rare elsewhere	Especially well developed in the UK but found elsewhere
H13	<i>Calluna vulgaris</i> - <i>Cladonia arbuscula</i> heath	✓	
H22	<i>Vaccinium myrtillus</i> - <i>Rubus chamaemorus</i> heath		✓
U10	<i>C. bigelowii</i> - <i>R. lamuginosum</i> moss heath.		✓
U13	<i>Deschampsia cespitosa</i> - <i>Galium saxatile</i> grassland	✓?	
CG11	<i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Alchemilla alpina</i> grass heath		✓