9. Rock Faces and Screes

9.1 Description

The development of vegetation on rock faces and screes is influenced by several factors including type and stability of rock, slope, aspect and shelter. Steep, unstable and exposed cliff faces and scree slopes support a range of specialized plants that are poorly competitive or sensitive to grazing. These rocky habitats are widespread throughout upland areas. Calcareous rock faces and scree, especially consisting of limestone, are particularly well represented in northern England.

Rock Faces

The plant communities that develop in these habitats are described as *chasmophytic* vegetation. Calcareous chasmophytic vegetation on limestone or other base-rich rocks is characterised by brittle bladder fern *(Cystopteris fragilis)*, green spleenwort *(Asplenium viride)* and maidenhair spleenwort *(A. trichomanes)*. The equivalent provisional NVC communities are the OV39 *Asplenium trichomanes-A. ruta-muraria* and OV40 *A. viride-C. fragilis* communities. In montane areas there is often also a range of characteristic and rarer Arctic-alpine species (see U15 *Saxifraga aizoides-Alchemilla glabra* banks in the montane section). The plants associated with acidic rock faces include black spleenwort *(Asplenium adiantum-nigrum)*, common scurvy-grass *(Cochlearia alpina)*, stiff sedge and fir club-moss *(Huperzia selago)*.

There are also distinctive grazing-intolerant communities that occur on ledges. In the U16 *Luzula sylvatica-V. myrtillus* community both woodrush (*Luzula sylvatica*) and bilberry occur in a tall, vigorous form with grasses and ferns. This community is confined to inaccessible ground where there has been protection from grazing and burning. It occurs in a variety of base-poor rocky habitats and on more isolated open slopes which are often shaded or have some modest flushing. It is found in the Border Uplands and Cumbrian Fells and Dales.

Another ledge community, the U17 *Luzula sylvatica-Geum rivale* tall herb community, is often associated with higher elevations. This is described in the montane section.

Scree

These habitats consist of rock fragments that cover the frost-shattered summits of high mountains or accumulate on steep slopes below cliffs. The scree is colonised by a range of pioneer species and provides shelter from grazing. Both calcareous (*eutric*) and acidic (*siliceous*) screes can support important plant communities. Calcareous screes are widely distributed in upland areas and characteristic species are herb robert *(Gymnocarpium robertianum)*, wall lettuce *(Mycelis muralis)* and limestone fern *(Geranium robertianum)*, with a range of rarer and more localised species at higher altitudes. The provisional NVC community for this vegetation is OV38 *Gymnocarpium robertianum-Arrhenatherum elatius* community.

The vegetation of acidic scree of sandstone, shales and granite is often dominated by ferns including parsley fern *(Cryptogramma crispa)*. Refer to the section 8 on grassland and fern communities.

9.2 Status

The international importance of rock faces and scree is recognised by the EC Directive on the Conservation of Natural and Semi-natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC) which lists chasmophytic vegetation (calcareous and silicolous sub-types), eutric scree and siliceous scree.

10. Limestone Pavement

10.1 Description

In some Natural Areas, flat expanses of limestone characterise the upland landscape. These *pavements*, formed during three geological periods (Carboniferous in England and Wales, Dalradean in Perthshire and Cambrian in the north-west of Scotland), stand proud of the surrounding moor vegetation. Glacial movement during the Pleistocene period has caused considerable erosion and localised weakening of these pavements which have since been subjected to weathering. Water has dissolved the rock leading to the formation of fissures resulting in an irregular surface typified by *clints* (surface rock), *grikes* (deep fissures) and *runnels* (shallower less eroded channels which drain into the grikes). In England pavements are found in the Cumbrian Fells and Dales, Yorkshire Dales and Morecambe Bay.

The conservation importance of this habitat is two-fold in that it has both geological and biological interest. The geological importance of each Natural Area is described in King et.al. (1996). This report describes their biological importance.

The surface characteristics of the rock, principally the depth and shape of the fissures, vary enormously both between and within pavements. These features influence moisture and light availability, humidity and wind speed as well as offering protection from grazing. Grike flora can be similar to the vegetation surrounding the pavement or, in the case of the deeper grikes, can be very different and of greater floristic interest.

A scheme to characterise the biological conservation interest of pavements was devised by Ward and Evans. The value of limestone pavement species was based on two considerations: firstly, whether the species is dependent on the pavement for its survival or can be found in open habitats surrounding the rock such as grassland, heathland and bracken and, secondly, its national distribution. Four groupings of species were identified: nationally rare species; nationally uncommon species, or with marked regional distribution; nationally common species; and species where the pavement is incidental to their occurrence (regardless of national status).

10.2 Status

Limestone pavement is a non-renewable resource. The area of British limestone pavement is small; the cartographic area being some 2150 hectares, whilst the area of pavement unaffected by stone removal and displacement has been estimated as 813 hectares (Ward and Evans, 1976). 88 percent of the British pavement is found in England. Limestone pavement is a scarce resource globally. It has been estimated that Britain holds more than 40 percent of the NW European area.

The international significance of the pavements in Britain are 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 limestone pavement as a priority habitat.

b) Under section 34 of the Wildlife and Countryside Act 1981 pavements can be protected, in addition to the normal SSSI provisions, by Limestone Pavement Orders which are conferred by Local Authorities whereby it is criminal offence to remove rock thus damaging the special interest of the site.

c) The United Nations Conference on Environment and Development Convention on Biological Diversity was ratified by the UK Government on 1 September 1994. The UK Steering Group Report provides a costed action plan for limestone pavement.

11. Scrub

11.1 Description

'Scrub' is used widely by conservationists generally to refer to tree and shrub growth (excluding ericoid and prostrate dwarf shrubs) less than five metres in height. Barkman (1990) identified some 27 types of scrub based on structural elements. This report is concerned with upland scrub communities including alpine and sub-alpine scrub at and above the altitudinal limit of tree growth. It also includes sub-montane scrub where soil conditions or exposure limit tree growth and natural succession. Scrub is thought to have been more widespread in the uplands in the past than it is today. Alpine scrub has probably suffered the severest reduction (Hester 1994).

Scrub can be found throughout the uplands and lowlands of England as scattered bushes and isolated, continuous or, sometimes, dense stands. There is a dearth of information about scrub community types and their status. However, there are certain species which are known to form scrub:

Dwarf Birch *(Betula nana)* is widespread in the north of Britain, generally in an altitude range of between 250 to 850 metres, but only occurs as localised and small populations. In England, outlying populations are located in the North Pennines and Border Uplands.

Silver birch (*Betula pendula)* and downy birch (*B. pubescens*) are pioneer species. Silver birch is prevalent throughout the south and east of England (Kinnaird 1968) on drier soils whilst downy birch can be found in the north and west and is able to tolerate more exposed conditions with impeded drainage. Birch scrub and woodland is found throughout the uplands (Kirby 1984)

Rowan *(Sorbus aucuparia)* is native throughout Britain and can grow at higher altitudes (over 1000 metres in Scotland) than any other tree.

Juniper *(Juniperus communis* ssp. *communis)* has the most extensive worldwide range of any tree and is the only tree that can be found growing in the wild on both sides of the Atlantic (Hester, 1994). It grows on chalk and limestone in England, in open and sunny locations and is tolerant of poor soils. In the UK its main area of distribution is in the Eastern and Central Highlands of Scotland. In England, it is found in scattered locations in the south and the north. Indications are that stands are being fragmented to the point where only isolated individuals remain. The recruitment and establishment of seedlings is low thus inhibiting the ability of existing colonies to regenerate naturally. These factors have been attributed to grazing pressure especially in the north of England where the juniper population consists almost entirely of old bushes of similar age. These are under threat from being grazed out completely and are vulnerable to disease. The NVC describes W19 *Juniperus communis* ssp. *communis-Oxalis acetosella* woodland where Juniper is always the most abundant woody species, sometimes with an over-canopy of birch. Other common species within this community are ericaceous shrubs (usually bilberry, cowberry and heather), ferns, herbs and bryophytes. This undershrub cover is affected by variation in soil and grazing. W19 is found at high altitudes, commonly at 300 - 650 metres in the colder but relatively dry parts of north-west Britain (Rodwell 1991).

Arctic-alpine Willows (*Salix spp*) occur occasionally within other montane communities. W20 *Salix lapponum-Luzula sylvatica* scrub is largely dominated by the willow *Salix lapponum* and forms small patches on ungrazed montane rocky slopes and ledges. This community is widespread but local in the Scottish Highlands with a relict outlier in the Cumbrian Fells and Dales.

11.2 Status

Scrub is part of the natural altitudinal sequence of vegetation types found within Great Britain which are of importance partly due to the British climate. It is also of significance because its presence increases the diversity of structure of upland vegetation especially when found in close proximity to grassland, heath and woodland.

The international importance of upland scrub is recognized by the EC Directive on the Conservation of Natural and Semi-natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC) which lists sub-Arctic willow scrub and juniper on heaths and calcareous grassland.

Part 2

Mountain and moorland profiles for the vegetation of England's upland Natural Areas

Natural Area: Black Mountains and Golden Valley	Mountain and Moorland Significance: Notable

Description: The Black Mountains form a striking plateau bounded to the northwest by the River Wye, to the south by the River Usk and to the east by the Herefordshire Plain. They are largely composed of sandstones which form the highest scarps at over 800 metres. The Black Mountain plateau is deeply dissected by southward flowing streams with the ridges supporting open heath, commons and woodland.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK -well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush & valley mires)	M6c	1	I
	M10	1/2	UK
	M15a	1/2	UK
	M19	1	UK
	M20	1	UK
Dry heath	H8	1/2	I
	H12	2	UK
	H18	2	L
Grassland and tall herb communities	CG10	2	UK
	U4	2	L
	U5	2	L
	U6	2	I
	U20	2	I
Scrub			

Nationally Rare and Scarce Plant Species:
None recorded

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Inappropriate grazing, accidental fires.
Dry heath	Inappropriate grazing, lack of controlled burning, accidental fires, bracken invasion, habitat fragmentation.
Grassland and tall herb communities	Agricultural improvement.
Scrub	

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Restore dwarf shrub condition. Reduce management intensity (burning and grazing).
Dry heath	Improve dwarf shrub condition. Encourage development of scrub on heather moorland.
Grassland and tall herb communities	Maintain patchwork of unimproved grassland. Enhance species-rich acid grassland.
Scrub	Restore scrub cover in gills

Significance: This area is moderately important for upland habitats. Small areas of dry heath (especially H8), wet heath (M15) and species-rich acidic and calcareous grasslands are the most significant features.

Natural Area: Bodmin Moor	Mountain and Moorland Significance: Notable

Description: Bodmin Moor is the largest area of semi-natural habitat in Cornwall and the most south-westerly upland area in Britain. The geology is dominated by the Bodmin granite with slates and shales around the fringe. The granite tors and surrounding clitter which cap many of the moorland summits are a distinctive feature of this Natural Area. The high moor has extensive tracts of open grassland seperated by shallow valleys, fragmented heathland and rocky outcrops. The moorland fringe supports scrub, bracken, enclosed grassland and steep river valleys.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK - well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush & valley mires)	M4	2	L
	M6c	2	I
	M15a, M15b	2	UK
	M16a, M16b	2	I
	M21a, M21b	3	L
	M25	3	I
Dry heath	H4a, H4b, H4c	1	I
	H8	1	I
	H12	1	UK
	H18	1	L
Grassland and tall herb communities	U3	3	I
	U4	3	L
	U5	2	L
	U6	1	I
	U20, U20a	2	I
Scrub			

Nationally Rare and Scarce Plant Species:
None recorded

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Inappropriate burning, overgrazing, off road vehicles.
Dry heath	Inappropriate burning, overgrazing, off road vehicles, habitat fragmentation.
Grassland and tall herb communities	Inappropriate grazing?
Scrub	Inappropriate management.

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Restore condition of dwarf shrub.
Dry heath	Improve condition of dry heath communities by reducing grazing pressure. Encourage development of scrub adjacent to heather moorland.
Grassland and tall herb communities	Ensure grassland communities are appropriately managed. Encourage development of a mosaic of dry heath and grasslands types.
Scrub	Ensure scrub is appropriately managed.

Significance: The most significant upland vegetation of Bodmin Moor is the extensive areas of the internationally scarce M25 and U3. Some additional interest is provided by frequent wet heath (M15 and M16), extensive valley mires (M21) and fragmented heathland (H4).

Natural Area: Border Uplands	Mountain and Moorland Significance: Considerable

Description: This Natural Area comprises the rolling moors of Northumberland and northeast Cumbria. The underlying geology, dominated by Carboniferous sandstones, limestones and dolomites, is covered by layers of glacial sediments and peat. The north of the Natural Area is dominated by the Cheviot in the west and the escarpements of the Fell Sandstone ridge to the east. The Cheviot Hills and outlying moors support extensive moorland and blanket bog, while acidic grasslands and grass moors dominate the more intensively managed areas.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK - well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Montane	U10	1	UK
	U17a	1	L
	H18a, H18c	1/2	L
	H19	2	L
	H22	1	UK
Blanket mire and wet heath (including Bog pool and flush & valley mires)	M2	1	L
	M3	1	L
	M4	2	L
	M6, M6a, M6b, M6c, M6d	3	I
	M9	1	L
	M10	2	UK
	M15,M15a, M15b, M15d	1	UK
	M16	1	I
	M17	1	I
	M18a	2	UK
	M19a, M19b, M19c	3	UK
	M20, M20a, M20b	3	UK
	M23	1	I
	M25, M25b	2	I
	M32	1	L
Dry heath	H9, H9b	2	UK
	H10a	1	UK
	H12b	1/2	UK
	H21a	1	I
Grassland and tall herb communities	U2	2	L
	U4a, U4e	3	L
	U5a, U5b, U5c, U5d	3	L
	U6, U6a	2	I
	U16, U16b, U16c	1	UK
	U20, U20a, U20c	2	I
	U21	1	L
	CG 9	1	I
	CG10a	2	UK
	MG10	1	?
Scrub	W19b	2	L

Nationally Rare and Scarce Plant Species:
Alchemilla glomerulans, Alchemilla gracilis, Alopecurus borealis, Betula nana, Carex magellanica, Euphrasia frigida, E. rostkoviana montana, Myosotis stolonifera, Sedum villosum.
(Allium schoenoprasum, Crepis mollis, Equisetum variegatum, Hammarbya paludosa, Minuartia verna, Sesleria caerulea, Thlaspi caerulescens).*

Key Issues	
Habitat	Issue
Montane	Overgrazing, pollution, acidification, recreation, access, fires.
Blanket mire and wet heath	Inappropriate grazing (including overgrazing), inappropriate burning, moor gripping/drainage, afforestation in the past.
Dry heath	Burning, overgrazing, agricultural reclamation, military use.
Grassland and tall herb communities	Overgrazing.
Scrub	Overgrazing, poor regeneration

Objective	
Habitat	Objective
Montane	Restore dwarf shrub and bryophytes on summit heaths
Blanket mire and wet heath	Retain, enhance and reinstate soil hydrology and hydrological features. Restore species composition and condition of dwarf shrub. Minimise intervention management. Restore open mire under conifer plantations.
Dry heath	Extend dwarf shrub vegetation to limit of unenclosed land. Improve condition of dry heath communities by reducing grazing pressure. Lengthen burning rotation. Encourage development of scrub adjacent to heather moorland.
Grassland and tall herb communities	Enhance species-rich grasslands and tall herb communities through appropriate management.
Scrub	Restore and enhance areas of Juniper scrub. Encourage regeneration of scrub adjacent to dwarf shrub and woodland. Increase scrub cover in gills.

Significance: The Border Uplands are of considerable interest for extensive areas of blanket bog (M19, M20) and flush mire (M6) communities.There is a good representation of vegetation characteristic of Northern England (H9, H12) together with more southern communities (U2, M16) and southern outliers of juniper scrub (W19). Additionally there are southern outliers for montane communities and high-altitude rock communities.

Natural Area: Central Marches	Mountain and Moorland Significance: Some

Description: The Central Marches Natural Area consists of the rolling hills of southwest Shropshire and northwest Herefordshire, and is contiguous with similar countryside in Central Wales. Small areas of heather moorland and unenclosed rough pasture exist in the uplands of Clun Forest.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK - well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush and valley mires).	**M4**		L
	M6		I
	M19	1	UK
	M21	2	L
	M23	1	I
Dry heath	H8	2	I
	H9	3	UK
	H12	2	UK
	H18	1	L
Grassland and tall herb communities	U4	3	L
	U5	1	L
	U6		I
	U20, U20a, U20c	1	I
Scrub			

Nationally Rare and Scarce Plant Species: None recorded.

Key Issues	
Habitat	**Issue**
Blanket mire and wet heath	Inappropriate grazing.
Dry heath	Inappropriate grazing, bracken encroachment, scrub encroachment, recreation, motor vehicles.
Grassland and tall herb communities	Agricultural improvement, overgrazing, bracken encroachment, afforestation.
Scrub	

Objective	
Habitat	**Objective**
Blanket mire and wet heath	Restore soil hydrology and hydrological features. Restore dwarf shrub cover.
Dry heath	Improve condition of dry heath communities. Reduce heathland fragmentation through habitat restoration.
Grassland and tall herb communities	Restore appropriate management to species-rich grasslands.
Scrub	Encourage development of scrub adjacent to heather moorland but remove from open moorland.

Significance: The Central Marches are of limited importance for upland communities. The most significant feature is the frequent to extensive cover of dry heath, especially the internationally rare H8.

Natural Area: Cumbrian Fells & Dales	Mountain and Moorland Significance: Outstanding

Description: This Natural Area comprises the Lake District mountains, the surrounding fells of the South Lakes, the Howgills and the Orton Fells. The geology is very diverse, and includes volcanic rocks, igneous intrusions, slates and shales and Carboniferous limestone The mountains rise into the montane zone and support high level heaths, grasslands and rock and scree. Lower down there are heaths and grasslands along with mires, lakes, tarns and rivers. Some of the most important areas of limestone pavement in Britain occur here.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I -internationally scarce with U.K. representation, UK - well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Montane	U7, U7c	1	L
	U10a, U10b	1	UK
	U15	2	L
	U17a, U17c	1	L
	H13	1	I
	H18a, H18c	2	L
	H19a, H19c	2	L
	CG11a	1	UK
	M31	1	L
	M32	2	L
Blanket mire and wet heath (including Bog pool and flush & valley mires)	M1	1	L
	M2	1	L
	M3	1	L
	M4	1	L
	M5	1	L
	M6, M6a, M6b, M6c,M6d	3	I
	M9	1	L
	M10, M10a	3	UK
	M11, M11b	2	UK
	M15, M15a, M15b	2	UK
	M16	1	I
	M17a, M17b, M17c	1	I
	M18a	2	UK
	M19a, M19b	3	UK
	M20, M20a, M20b	2	UK
	M21, M21a	1	L
	M23	3	I
	M25a, M25b, M25c	2	I
	M26	1	I
	M27	1	?
	M29	1	I
	M32	2	L
	M35	1	L
	M37	1	L
Dry Heath	H8	1	I
	H9	1	UK
	H10a, H10b	1	UK
	H12a, H12b, H12c	2	UK
	H13	1	I
	H16	1	L
	H21a	2	I
Grassland and tall herb communities	U1	1	L
	U2	1	L
	U4a, U4b, U4d, U4c	3	L
	U5a, U5b, U5d, U5c	3	L
	U6, U6a	3	I
	U13	1	I
	U16	2	UK
	U19	1	L
	U20, U20a, U20b, U20c	3	I
	U21	3	L
	CG9a, CG9b, CG9c	2	I
	CG10a, CG10b	2	UK
	OV38	2	?
	OV39	2	?
	OV40	2	?
Scrub	W19a	1	L

Nationally Rare and Scarce Plant Species:
Ajuga pyramidalis, Alchemilla wichurae, Bartsia alpina, Carex atrata, C. capillaris, C. magellanica, Cerastium alpinum, Circaea alpina, Dryas octopetala, Euphrasia frigida, E. ostenfeldii, E. rivularis, E. rostkoviana, Lychnis alpina*, Lycopodium annotinum, Myosotis stolonifera, Phleum alpinum, Poa alpina, P. glauca, Polygala amarella, Potentilla crantzii, P. fruticosa*, Salix lapponum, Saxifraga nivalis, Sedum villosum, Woodsia ilvensis*.*
(Actaea spicata, Asplenium septentrionale, Cardamine impatiens, Carex ericetorum, C. ornithopoda, Crepis mollis, Dryopteris submontana, Epipactis atrorubens, Equisetum variegatum, Gymnocarpium robertianum, Hammarbya paludosa, Helianthemum canum,, Hornungia petraea, Lycopodiella innundata*, Minuartia verna, Polygonatum odoratum, Primula farinosa, Ribes spicatum, Sesleria caerulea, Sorbus rupicola, Trichomanes speciosum).*

Key Issues

Habitat	Issue
Montane	Overgrazing, recreation, pollution
Blanket mire and wet heath	Peat cutting, scrub encroachment, drainage, eutrophication, overgrazing.
Dry heath	Overgrazing, afforestation, burning, stockfeeding, recreation, bracken encroachment, wind farms.
Grassland and tall herb communities and limestone pavement.	Removal of rock from pavements, scrub and bracken encroachment, overgrazing and undergrazing, agricultural intensification.
Scrub	Overgrazing

Objective

Habitat	Objective
Montane	Restore dwarf shrubs and bryophytes to summit heaths. Reduce/eliminate livestock grazing.
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Restore composition and condition of dwarf shrub. Reduce burning and grazing.
Dry heath	Improve condition of dry heath communities by reducing grazing pressure and extend dwarf shrub cover to limit of unenclosed land. Encourage development of scrub adjacent to heather moorland and woodland.
Grassland and tall herb communities and limestone pavement	Ensure areas of lightly grazed tussocky, uneven grassland are maintained. Ensure no further loss of pavement, introduce appropriate grazing management and enhance condition.
Scrub	Encourage regeneration of gill woodland and scrub.

Significance:The Cumbrian Fells and Dales are very important for a wide range of vegetation types, including many communities that are scarce or absent elsewhere in England. Communities for which this area is particularly important include those of the montane zone (H13, U10, U16, CG11). There is also a good representation of many internationally scarce and nationally important mire and heathland communities (M6, M10, M19, M23, H12) and grassland types (U6, CG9, CG10). Several communities with a wider distribution in Scotland appear to be restricted to this area in England (CG11, H16, M5, M31, U13, U15). As a consequence of this high frequency of restricted plant communities, Cumbria also has a large number of nationally rare and scarce plant species.

Natural Area: Dark Peak	Mountain and Moorland Significance: Some

Description: The Dark Peak is formed by coarse millstone grit and softer shales overlain by peat. The summits of the hills reach 610 metres at Kinder Scout and form relatively level plateaux which are dissected by deep narrow valleys called cloughs. The main vegetation is moorland with blanket mire on the deep peats, dry heath on the lower slopes and acid grassland on more intensively managed land. Springs, flushes, woods and wet rock faces are found in the cloughs.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK - well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush & valley mires)	**M2b**		L
	M3		L
	M4		L
	M6a, M6b, M6c	3	I
	M10		UK
	M16		I
	M19a, M19b	1	UK
	M20a, M20b	3	UK
	M21b		L
	M25a, M25b	2	L
	M32		L
	M35		L
	M37		L
Dry heath	H8b	1	I
	H9, H9a, H9b, H9c, H9e	3	UK
	H12	2	UK
	H18	2	L
Grassland and tall herb communities	U2	2	L
	U4, U4a, U4b, U4c, **U4e**	3	L
	U5d	2	L
	U6	1	I
	U20	3	I
Scrub			

Nationally Rare and Scarce Plant Species:
(*Trichomanes speciosum.*)

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Gripping, burning, fragmentation, overgrazing, accidental fires, erosion.
Dry heath	Recreation and accidental fires, erosion, local overgrazing, bracken invasion, burning, fragmentation.
Grassland and tall herb communities	Drainage, improvement, inappropriate grazing, bracken & scrub invasion, access and recreation.
Scrub	

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Maintain and restore species composition and condition of dwarf shrub. Reduce or eliminate burning.
Dry heath	Improve condition of dry heath communities by reducing grazing pressure. Extend dwarf shrub vegetation to limit of unenclosed land. Lengthen burning rotation.
Grassland and tall herb communities	Ensure grassland communities are appropriately managed. Encourage development of a mosaic of dry heath and grasslands types.
Scrub	Encourage natural regeneration of gill woodland/scrub and development of scrub adjacent to moorland and woodland edge.

Significance: The Dark Peak is of limited significance for its extensive areas of northern blanket bog (M20 with M6) and upland dry heath (H9, H18).

Natural Area: Dartmoor	Mountain and Moorland Significance: Outstanding

Description: Dartmoor is the largest area of moorland in southern England and the largest area of unglaciated moorland in Great Britain. The Natural Area is dominated by the massive igneous intrusion of the Dartmoor Granite. The dome-shaped granite intrusion has produced a distinctive landscape with a radial drainage pattern and granite tors. There are extensive blanket bogs on peats up to seven metres deep on the higher moors, with some active bogs in areas of impeded drainage. Other habitats include wet and dry heaths and valley mires.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK -well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath	M1	2	L
	M2	2	L
	M3	2	L
	M4	2	L
	M6a, M6c, M6d	3	I
	M15, M15a, M15b,M15d	2	UK
	M16a, M16b	2	I
	M17a, M17c	3	L
	M21	3	L
	M23a	2	I
	M25a, M25b	2	I
	M29	1	I
Dry heath	H4a, H4b, H4c, H4d	3	I
	H8b	2	I
	H10a	1	UK
	H12a, H12c	2	UK
	H18a, H18c	1	L
Grassland and tall herb communities	U2	2	L
	U3	3	I
	U4a, U4e	2	L
	U5, U5a, U5c	2	L
	U6, U6a, U6c	1	I
	U20, U20a, U20b	2	I
Scrub			

Nationally Rare and Scarce Plant Species:
Spiranthes romanzoffiana.
(Asplenium septentrionale, Euphrasia vigursii, Hammarbya paludosa, Lycopodiella innundata* Trichomanes speciosum*)*

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Inappropriate burning especially in summer. Inappropriate grazing (especially overgrazing). Peat erosion. Water abstraction.
Dry heath	Overgrazing/burning. High reclamation.
Grassland and tall herb communities	Bracken encroachment, overgrazing and drainage.
Scrub	

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Maintain and restore species composition and condition of dwarf shrub. Reduce or eliminate burning.
Dry heath	Improve condition of dry heath communities. Extend dwarf shrub vegetation to limit of unenclosed land and restore areas of grass moor to heathland. Lengthen burning rotation and encourage development of mature heather
Grassland and tall herb communities	Maintain and enhance rhos pasture and other grassland communities
Scrub	Encourage natural regeneration of gill woodland/scrub and development of scrub adjacent to moorland and woodland edge.

Significance: The vegetation of Dartmoor is of particular interest in that it combines western oceanic communities with a more northern, upland component. This includes extensive areas of internationally important blanket mire (M17) and some of the best areas of wet heath (mainly M15) in England. These wet and predominantly western communities occur with dry heath including the upland H12 and the lowland H4. The extensive valley mires (M21) are also of significant interest.

Natural Area: Exmoor and the Quantocks	Mountain and Moorland Significance: Considerable

Description: Exmoor is an elongated core of high land lying above the Culm Measures of Devon and Somerset. The Quantocks are separated from Exmoor to the east by the Vale of Taunton. These upland areas are mostly underlain with slates, shales, sandstones and grits of the Devonian system. Erosion by numerous streams radiating from the upland core has given rise to several deep valleys and has created the characteristic hog's back ridges of this area.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I -internationally scarce with U.K. representation, UK -well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush & valley mires)	M1	1	L
	M2	1	L
	M3	1	L
	M4	1	L
	M6a, **M6b,** M6c, M6d	2	I
	M9	1	L
	M10	1	UK
	M15a,M15b,**M15c,**M15d	1	UK
	M16d	1	I
	M17, **M17c**	2	I
	M23	2	I
	M25, M25b	3	I
	M29	1	I
	M32	1	L
	M35	1	L
Dry heath	H4a, H4b, H4c, **H4d**	3	I
	H8a, H8b	1	I
	H10a	1	UK
	H12a, H12b, H12c	3	UK
	H18, **H18a**	1	L
	H21a	1	I
Grassland and tall herb communities	U3	1	I
	U4a, U4b, **U4c**	3	L
	U5d	1	L
	U19	1	L
	U20, **U20b**	3	L
Scrub			

Nationally Rare and Scarce Plant Species:
(Sorbus rupicola.)

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Burning and historical drainage.
Dry heath	Undergrazing (particularly the Quantocks) and conversion to grass moor through burning and reclamation. Control of invasive species (bracken, rhododendron). Damage due to excessive use of winter feed. Use of motorised vehicles by hunt followers.
Grassland and tall herb communities	Inappropriate grazing, agricultural reclamation.
Scrub	Inappropriate grazing. Education/change attitude/raise awareness of importance of scrub communities.

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Maintain existing dwarf shrub cover. Introduce non-intervention areas.
Dry heath	Encourage appropriate grazing management and lengthen burning rotation. Reduce cover of invasive species (Rhododendron).
Grassland and tall herb communities	Ensure grassland communities are appropriately managed. Maintain a mosaic of dry heath and grasslands.
Scrub	Maintain and enhance natural regeneration of coombe woodland/scrub and maintain existing balance of scrub and open moorland.

Significance: The most important upland vegetation of this Natural Area is the extensive area of internationally important dry heath. Exmoor supports the largest area of this vegetation in southwest England. The heathland is of particular interest in that it consists of both a lowland and southwestern component (H4) alongside more upland communities (H8 and H12) and there is extensive tall, mature heather. The mesotrophic valley mires (M6) are of additional importance.

Natural Area: Forest of Bowland	Mountain and Moorland Significance: Considerable

Description: The Forest of Bowland Natural Area is dominated by Carboniferous Limestone, Bowland Shale and Millstone Grit forming an open and rugged upland area. Pendle Hill forms a distinctive landform to the east of the Natural Area, with a steep escarpment capped by millstone grit. The Bowland Fells form an almost circular upland dome of heather moorland and blanket mire, rising to 560 metres at Wards Stone. The landscape is further characterised by gritstone outcrops and steep, wooded valleys.

Habitat	NVC present	Extent in Natural Area (1-fragmented, 2-frequent, 3-extensive)	Significance (I - internationally scarce with U.K. representation, UK -well developed in U.K. but represented elsewhere, L - Widely developed in Europe)
Blanket mire and wet heath (including Bog pool and flush and valley mires).	M2	2	L
	M4	2	L
	M6a, M6b, M6c	3	I
	M10	1	UK
	M15	2?	UK
	M18	2	UK
	M19	3	UK
	M20a, M20b	3	UK
	M23	1	I
	M25a, M25b	2	I
	M32	1	L
Dry heath	H9	3	UK
	H10	1	UK
	H12	2	UK
	H18	1	L
	H21a	1	I
Grassland and tall herb communities	**U2**	2?	L
	U4	3	L
	U5	3	L
	U6	2	I
	U20a, U20c	2	I
Scrub			

Nationally Rare and Scarce Plant Species:
Myosotis stolonifera
(Dryopteris submontana, Primula farinosa.)

Key Issues	
Habitat	Issue
Blanket mire and wet heath	Overgrazing, recreation and access, inappropriate burning, reclamation and improvement, drainage and pollution.
Dry heath	Overgrazing, recreation and access, inappropriate burning, reclamation and improvement.
Grassland and tall herb communities	Agricultural improvement.
Scrub	

Objective	
Habitat	Objective
Blanket mire and wet heath	Retain and enhance soil hydrology and hydrological features. Restore condition of dwarf shrub. Reduce burning and grazing.
Dry heath	Improve condition of dry heath communities by reducing grazing pressure and lengthening burning rotation. Encourage development of scrub adjacent to heather moorland and woodland.
Grassland and tall herb communities	Maintain a mosaic of dry heath, grassland and bracken, particularly through control of bracken.
Scrub	Increase scrub cover in gills and adopt minimal intervention where appropriate.

Significance: The upland vegetation of the Bowland Fells is notable for extensive areas of northern blanket bog (M19, M20) and dry heath (H9, H12) and associated mires (M6).