



## **UK Terrestrial & Freshwater Habitat Types: Uplands Habitat descriptions**

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<https://webarchive.nationalarchives.gov.uk/20190301141028/http://jncc.defra.gov.uk/page-4532>).

The descriptions include information on a habitat's characteristics, extent & distribution, pressures & threats, condition, protection, and management. Although much of the information remains of value and interest, it is historic and therefore does not necessarily reflect the most up-to-date state of knowledge of the habitat.

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# UK Upland Habitats

The uplands of the UK support a diverse range of open, semi-natural habitats. These include very large expanses of blanket bog and upland heathland, more moderate tracts of inland rock outcrop and scree habitats, mountain heaths and willow scrub, upland flushes, fens and swamps, and upland calcareous grassland, and smaller amounts of limestone pavement and calaminarian grassland. Such habitats occur above the upper limits of agricultural enclosure, usually over 250–400 m altitude, and reflect differences in climatic conditions, under-lying soils, hydrology and management history. Collectively they cover around one-third of the UK land surface. Note that this excludes upland woodlands, upland freshwaters and upland hay meadows.

Upland semi-natural habitats are a priority for nature conservation. They are home to an enormous variety of highly specialised plants and animals, and include some of the most natural, appealing and threatened habitat types in the UK. Accordingly, there are a number of upland priority habitats under the UK Biodiversity Action Plan and 21 upland habitat types listed under Annex I of the EU Habitats Directive.

Despite their outstanding scenic qualities and importance for biodiversity, the uplands have suffered huge losses of semi-natural habitat and associated species. Since the 1950s, species-poor acid grasslands, 'improved' hill pastures and conifer plantations have replaced many areas of semi-natural habitat due mainly to afforestation and improvements made for agriculture and game rearing. There have also been widespread reductions in the extent and quality of surviving areas of upland habitats due to over-grazing, inappropriate burning, peat extraction, and quarrying, combined with extensive atmospheric pollution.

## 1 UK Upland Habitat Types & Characteristics

### 1.1 Blanket Bog



Blanket bog is a wet peatland habitat that dominates much of upland Britain. Although this is a globally restricted habitat type, confined to oceanic climates, it is one of the most extensive remaining semi-natural habitats in the UK. Examples can be found from Devon in south-west England to the Shetland Isles in the north. These bogs are of international importance, forming 'type' examples for this globally restricted habitat.

Blanket bog is an open habitat almost entirely restricted to the uplands in England and Wales, but which descends to sea level in parts of Scotland. It is characteristically underlain by an expansive 'blanket' layer of peat. This develops because the climate is sufficiently cool and damp to allow peat-forming plants to grow – the litter of which decomposes very slowly under the permanently water-logged conditions and gradually accumulates into a layer of peat. The peat depth and time over which it has accumulated are very variable – usually it is between 0.5–3 m thick and dates back 5–6,000 years. The main causes of the spread of blanket bog are debated – although in some areas this initiated following clearance of the original forest cover by man, this co-incided with a general natural cooling in climate conditions.

Within upland 'blanket mire' landscapes, a wide variety of hydrological and geochemical conditions can be found. Blanket bogs are fed only by rainwater, i.e. they are ombrotrophic mires. Elsewhere, other habitats occur including transitional mires and quaking bogs; minerotrophic (groundwater-fed) poor-fen, flush or swamp; a range of oligotrophic water bodies (whose catchment is largely or entirely blanket bog); relatively small areas of heath and grassland on better drained slopes; and numerous streams and rivers which drain blanket mire landscapes.

The challenging blanket mire environment offers a competitive advantage to the relatively limited range of species which are adapted to such conditions. However, natural bogs characteristically possess a surface pattern or microtopography of hummocks, ridges, hollows or pools that provide a distinctive range of habitats for three broad groups of plants to exploit:

- The main bog species – which dominate the wetter ridges in various combinations and largely create the small-scale topography of the bog surface – and include various *Sphagnum* bog mosses, common/hare's tail cotton-grass *Eriophorum angustifolium* / *vaginatum*, cross-leaved heath *Erica tetralix*, and deer-grass *Trichophorum cespitosum*;
- Dry-humid heath species – such as bilberry/blueberry *Vaccinium myrtillus*, crowberry *Empetrum nigrum*, heather *Calluna vulgaris*, and round-leaved sundew *Drosera rotundifolia* that maintain a presence on hummocks and drier ridges – and outlier plants of small-sedge fen – such as bogbean *Menyanthes trifoliata*, bog sedge *Carex limosa*, and many-stalked spike-rush *Eleocharis multicaulis* that compete with some success in hollows and pools;
- Regional, blanket bog specialists – including cloudberry *Rubus chamaemorus* that is mostly confined to high altitude bogs; alpine bearberry *Arctostaphylos alpinus* on northern bogs; black bog-rush *Schoenus nigricans* as an ombrotrophic species on western bogs; and the woolly hair moss *Racomitrium lanuginosum* which largely replaces the role of *Sphagnum* bog mosses in the north and west and particularly on the Scottish Western Isles.

These combine in various forms to create a suite of specialised plant communities, including:

- bog pool communities characterised by the mosses *Sphagnum auriculatum* / *cuspidatum* / *recurvum* or common cottongrass;
- wet heath communities characterised by deergrass and cross-leaved heath;
- blanket, raised and valley mire communities, variously characterised by beaked sedge *Carex rostrata*, bog asphodel *Narthecium ossifragum*, cross-leaved heath, deergrass, hare's tail cottongrass, heather, purple moor grass *Molinia caerulea*, tormentil *Potentilla erecta*, or the mosses *Calliergon cuspidatum* / *giganteum* and *Sphagnum papillosum* / *recurvum* / *squarrosum* / *warnstorffii*;
- soakway communities characterised by marsh St John's wort *Hypericum elodes* and bog pondweed *Potamogeton polygonifolius*
- tall herb fen communities characterised by beaked sedge and marsh cinquefoil *Potentilla palustre*.

Blanket bogs support a distinctive and diverse array of terrestrial and aquatic animals. These include:

- important breeding wader assemblages of golden plover, dunlin, and greenshank;
- other unusual breeding birds, such as the red-necked phalarope and red-throated diver;
- charismatic bird predators, such as the short-eared owl, merlin and hen harrier;
- dragonflies and damselflies (e.g. the rare blue hawk *Aeshna caerulea*);
- various diving beetles (e.g. the rare relict *Oreodites alpinus* and rare caddis larva *Nemotaulius punctatolineatus*);
- butterflies (including the large and small heath *Coenonympha tullia*, *C. pamphillu*);

- many moth species (from the large emperor moth *Saturnia pavonia* to a numerous micro-moth species);
- an array of spiders (including the large, bog raft spider *Dolomedes fimbriatus*).

## 1.2 Calaminarian grassland

Calaminarian grassland can be found on soils that have levels of heavy metals, such as lead, zinc chromium and copper, which are toxic to most plant species. It mostly occurs in the north and west of the UK, in one of the following situations:

- as near-natural, open vegetation of serpentine rock and mineral vein outcrops with skeletal soils, such as at the Keen of Hamar in Shetland;
- on stable river gravels rich in lead and zinc, such as on the Tyne and Allen river gravels in Northumberland; or
- most commonly, on artificial mine workings and spoil heaps resulting from past mining activity, such as on the Halkyn Mountain in north Wales.

Because of the soil toxicity and paucity of nutrients, the vegetation is normally open, species-poor, slow-growing and has a very open grassy structure with limited vegetation cover.

Characteristic plants include two nationally scarce plants, spring sandwort *Minuartia verna* and alpine penny-cress *Thlaspi caerulescens*, along with bird's-foot trefoil *Lotus corniculatus*, common bent grass *Agrostis capillaris*, fairy flax *Linum catharticum*, harebell *Campanula rotundifolia*, sheep's fescue *Festuca ovina*, sheep sorrel *Rumex acetosella*, and wild thyme *Thymus polytrichus*.

Certain species, including sheep's fescue, sea campion *Silene uniflora* and thrift *Armeria maritima*, occur in genetically adapted forms to cope with the toxic soil conditions.

Rarer species, such as forked spleenwort *Asplenium septentrionale*, benefit from the lack of competition from vigorous plants. Some sites hold important populations of rare bryophytes and lichens.

## 1.3 Inland Rock Outcrop & Scree Habitats

These habitats occur throughout the uplands. They are found on stony ground on cliff ledges, crags, ridges, summits, scree slopes, and amongst cracks and fissures of rock faces. Although particularly characteristic of high altitudes, rock and scree habitats are also found at lower elevations, notably in northern Scotland. They grow on a wide range of substrates, from acidic to highly calcareous and base-poor to base-rich.

A wide range of vegetation communities can be found on inland rock outcrops and screes. Some are very sparse, some are very species-rich; some are well-vegetated, whilst others are species-poor; some are dominated by ferns or grasses and herbs, whilst others are dominated by low-growing cryptogams.

Summary details of major vegetation types (as described in the National Vegetation Classification) associated with inland rock outcrop and scree are given in the table below.

**Table 1.1.** Summary of major vegetation types associated with inland rock outcrop and scree.

NVC type	Main locations	Description
U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	Confined to exposed, base-poor rocks and screes in the Scottish uplands, with outliers in the Lake District and Cheviots	Typically dominated by mixtures of great wood-rush <i>Luzula sylvatica</i> and bilberry / blueberry <i>Vaccinium myrtillus</i> , which sometimes grow to considerable stature. It is confined to cold, wet, upland areas, on ledges, in crags, over screes, on top of boulders or on rocky lake islands where protected from grazing and burning. Some flushing with moderately base-rich waters can occur.
U17 <i>Luzula sylvatica</i> - <i>Geum rivale</i> tall herb community	Confined to exposed, base-rich rocks and screes, or acid rocks flushed with base-rich waters, in the Scottish Highlands and Isles, with outliers in northern England and north Wales	Confined to inaccessible situations, such as ledges on cliffs and crags in ravines, or ground among or on top of boulders, or on islands in lakes, where livestock and deer rarely, if ever, penetrate. It is associated with flushed locations and persistently wet conditions of the north-west. Major species include great wood-rush <i>Luzula sylvatica</i> , roseroot <i>Rhodiola rosea</i> , tufted hair-grass <i>Deschampsia cespitosa</i> , sheep's fescue/viviparous sheep's-fescue <i>Festuca ovina/vivipara</i> , water avens <i>Geum rivale</i> , wild angelica <i>Angelica sylvestris</i> , and the moss <i>Hylocomium splendens</i> . This is a varied community, with, for example, isolated stands on ledges of the same cliff face often having markedly different plants. It can be very species-rich and supports many extremely localised plant species.
U18 <i>Cryptogramma crispa</i> - <i>Athyrium distentifolium</i> snow-bed	Confined to high altitude, base-poor snow-beds in the Scottish uplands	Confined to high-altitude snow-beds, on rocky ground with base-poor, humic soils. It is usually dominated by Alpine lady-fern <i>Athyrium distentifolium</i> and, especially on lower slopes, parsley fern <i>Cryptogramma crispa</i> , together with Alpine lady's mantle <i>Alchemilla alpina</i> , Alpine marsh violet <i>Viola palustris</i> , common sorrel <i>Rumex acetosa</i> , heath bedstraw <i>Galium saxatile</i> , starry saxifrage <i>Saxifraga stellaris</i> , tufted hair-grass <i>Deschampsia cespitosa</i> , and wavy hair-grass <i>Deschampsia flexuosa</i> . Mosses are numerous and varied, such as <i>Barbilophozia floerkii</i> , <i>Hylocomium splendens</i> , <i>Hypnum callichroum</i> , <i>Kiaeria starkei</i> , <i>Polytrichum alpinum</i> , and <i>Rhytidiadelphus loreus</i> (which sometimes forms carpets among the rocks). Lichens, such as <i>Cladonia bellidiflora</i> , are characteristic.
U21 <i>Cryptogramma crispa</i> - <i>Deschampsia flexuosa</i> community	Mostly exposed, base-poor rock and screes at relatively low to moderate altitudes	Comprises pioneer vegetation of acidic screes and tumbled boulders, typically with parsley fern <i>Cryptogramma crispa</i> the dominant species. Young stands often only have patches of encrusting mosses such as <i>Andreaea rupestris</i> and <i>Racomitrium fasciculare</i> . Nevertheless, heath bedstraw <i>Galium saxatile</i> , sheep's-fescue <i>Festuca ovina</i> , wavy hair-grass <i>Deschampsia flexuosa</i> , and the mosses <i>Campylopus paradoxus</i> and <i>Polytrichum formosum</i> are all characteristically present.

NVC type	Main locations	Description
OV38 <i>Gymnocarpium robertianum</i> - <i>Arrhenatherum elatius</i> community	Mostly exposed, base-rich screes and rocky limestone slopes, in southern Britain	Typically comprises more or less open stands of limestone fern <i>Gymnocarpium robertianum</i> and false oat-grass <i>Arrhenatherum elatius</i> , together with herb Robert <i>Geranium robertianum</i> , red / sheep's fescue <i>Festuca rubra/ovina</i> , wood sage <i>Teucrium scorodonia</i> , and the moss <i>Ctenidium molluscum</i> . Other common plants include wall-lettuce <i>Mycelis muralis</i> , dog's mercury <i>Mercurialis perennis</i> and the feather moss <i>Homalothecium sericeum</i> . Whilst mosses are frequently numerous and can be locally plentiful, lichens are scarce.
OV39 <i>Asplenium trichomanes</i> - <i>Asplenium ruta-muraria</i> community	Mostly exposed, base-rich rocks and screes at relatively low to moderate altitudes in the west	Characteristic of crevices in lime-rich bedrocks and wall-mortar, especially toward the more humid west of Britain. It generally comprises very open, fragmentary stands of low-growing ferns and bryophytes, such as <i>Asplenium trichomanes</i> , <i>Asplenium ruta-muraria</i> , <i>Homalothecium sericeum</i> , and <i>Porella platyphylla</i> . However, biting stonecrop <i>Sedum acre</i> , thyme-leaved sandwort <i>Arenaria serpyllifolia</i> , sheep's fescue <i>Festuca ovina</i> , wild thyme <i>Thymus praecox</i> , and a range of lime-loving grassland species can also feature.
OV40 <i>Asplenium viride</i> - <i>Cystopteris fragilis</i> community	Confined to exposed, base-rich rock and scree habitats in upland Britain	Open, often fragmentary vegetation of rock crevices, narrow ledges, and amongst screes, where a variety of ferns characteristically assume prominence. Green spleenwort <i>Asplenium viride</i> is most characteristic, particularly in the mountains of Scotland and northern England. Maidenhair spleenwort <i>Asplenium trichomanes</i> and wall-rue <i>Asplenium ruta-muraria</i> are common, but decline rapidly at higher altitudes. Brittle bladder-fern <i>Cystopteris fragilis</i> is generally found throughout, whereas hart's-tongue fern <i>Phyllitis scolopendrium</i> is typical of lower altitudes, and northern holly fern <i>Polystichum lonchitis</i> of the mountains of Scotland. Few other vascular plants occur, although sheep's fescue <i>Festuca ovina</i> is usually present. Bryophytes can be abundant, notably <i>Ctenidium molluscum</i> , <i>Fissidens cristatus</i> and <i>Tortella tortuosa</i> . Lichens are generally scarce.

[Lichens and bryophytes](#) are one of the most notable features associated with inland rock outcrop and scree habitats. Many hundreds of individual species have been recorded growing on rock faces and scree, with different communities associated with acidic rock and limestone. Two groups of lichen species are of outstanding conservation interest: (1) species of western oceanic areas; and (2) species of calcareous rock at high altitudes. Inland rock outcrop and scree habitats are important for a range of animals. Inland crags in the Scottish uplands provide important nesting sites for golden eagle, sea eagle, raven and peregrine falcon. Snow buntings nest among boulders in high corries. Botanically-rich rock habitats support a number of notable invertebrate species. Key groups include beetles, such as the ground beetles *Leistus montanus* and *Nebria nivalis*, flies such as *Tipula* and *Thricops* species and *Helina vicina*, and spiders, such as the highly localised *Pardosa traillii*.

## 1.4 Limestone Pavement

This habitat is made of outcrops of limestone rock. Although a few examples are on steep slopes, most are more-or-less horizontal. Characteristically, the limestone rock surface has been weathered over millions of years into paving blocks (known as 'clints'), which have a complex pattern of crevices between them (known as 'grikes').

It is widely scattered across the uplands of Wales, northern England, Northern Ireland, and Scotland. The largest areas occur on Carboniferous limestone in North Yorkshire and Cumbria, with smaller areas in Lancashire and Wales. It also occurs in Scotland, on the more ancient Dalradian and Durness limestones.

Limestone pavement supports a very wide range of vegetation communities and characteristic species – see below. The vegetation is characteristically rich in vascular plants, bryophytes and lichens. It varies according to geographical location, altitude, rock type, drainage, and the presence of grazing animals. It often contains an unusual combination of plants. On the clint surfaces or upper walls of the grikes there are plants of rocky habitats, such as wall-rue *Asplenium ruta-muraria* and maidenhair spleenwort *Asplenium trichomanes*. In contrast, the grikes provide a shady, humid environment, which favours woodland or wood-edge plants, such as hart's-tongue fern *Phyllitis scolopendrium* and dog's mercury *Mercurialis perennis*. In the absence of grazing, shrubs and trees may develop within the grykes to create various forms of 'wooded pavement'. In oceanic areas, scrub over limestone pavement is an important habitat for epiphytes.

**Table 1.2.** Vegetation types and characteristic species associated with limestone pavement.

Vegetation types	Characteristic species
Calcareous grassland/heath	Blue moor-grass <i>Sesleria caerulea</i> [ <i>Sesleria albicans</i> ], common bent <i>Agrostis capillaris</i> , common knapweed <i>Centaurea nigra</i> , crested dog's tail <i>Cynosurus cristatus</i> , glaucous sedge <i>Carex flacca</i> , limestone bedstraw <i>Galium sternerii</i> , mountain avens <i>Dryas octopetala</i> , sheep's-fescue <i>Festuca ovina</i> , wild thyme <i>Thymus praecox</i>
Mire	Common butterwort <i>Pinguicula vulgaris</i> , dioecious sedge <i>Carex dioica</i> , marsh hawkbeard <i>Crepis paludosa</i> , meadowsweet <i>Filipendula ulmaria</i> , purple moor grass <i>Molinia caerulea</i> , wild angelica <i>Angelica sylvestris</i>
Open vegetation	Brittle bladder-fern <i>Cystopteris fragilis</i> , false oat-grass <i>Arrhenatherum elatius</i> , green spleenwort <i>Asplenium viride</i> , limestone fern <i>Gymnocarpium robertianum</i> , maidenhair spleenwort <i>Asplenium Trichomanes</i> , wall-rue <i>Asplenium ruta-muraria</i>
Scrub and woodland	Ash <i>Fraxinus excelsior</i> , dog's mercury <i>Mercurialis perennis</i> , field maple <i>Acer campestre</i> , hawthorn <i>Crataegus monogyna</i> , ivy <i>Hedera helix</i> , juniper <i>Juniperus communis</i> , rowan <i>Sorbus aucuparia</i> , wood sorrel <i>Oxalis acetosella</i> , yew <i>Taxus baccata</i>

## 1.5 Mountain Heaths & Willow Scrub

This habitat occurs in the montane zone above the natural tree-line. It encompasses a diverse range of near-natural vegetation. These are found mostly above 600 m in altitude, but in the north-west Highlands and Scottish Islands they occur to 300 m or, in places, even lower. Some of the types are characteristic of exposed ridges and summits – others are restricted to sheltered situations where snow lies late. They are typically maintained by cool,

windy conditions, low temperatures, extreme wind exposure, prolonged snow-cover, freeze-thaw and/or nutrient-poor, thin soils.

### Montane heaths

These include a range of vegetation types (see below) that occur either above the altitudinal tree-line (i.e. Alpine heaths) or below it in gaps among scrubby high-altitude woods or in place of woodland lost due to grazing and burning (i.e. Boreal heaths).

**Table 1.3.** Vegetation types associated with montane heaths.

<b>Prostrate dwarf shrub montane heaths</b>
<ul style="list-style-type: none"> <li>The most common and visually distinctive montane heaths are the prostrate heather <i>Calluna vulgaris</i> communities. Here, heather grows in a purple-brown carpet with stems creeping sinuously over the ground away from the direction of the prevailing wind. Although there are species-poor forms, with little other than the heather itself, generally there is a mat of either <i>Racomitrium lanuginosum</i> moss or lichens such as <i>Cladonia arbuscula</i>, <i>Cladonia rangiferina</i>, and <i>Cetraria islandica</i>.</li> </ul>
<ul style="list-style-type: none"> <li>There are similar prostrate bilberry/blaeberry <i>Vaccinium myrtillus</i> and mountain crowberry <i>Empetrum nigrum</i> ssp. <i>hermaphroditum</i> montane heaths, which also have lichen-rich and <i>Racomitrium</i>-rich forms. These are strikingly attractive, with rich green dwarf shrubs spangled with golden bryophytes or crisp, cream-white lichens.</li> </ul>
<ul style="list-style-type: none"> <li>Two other forms of prostrate montane heath are far less common. <i>Calluna-Juniperus communis</i> ssp. <i>nana</i> heath is a speciality of the north-west Highlands. Here, the mat of heather is interspersed with patches of dwarf juniper <i>Juniperus communis</i> ssp. <i>nana</i> with its conspicuous mats and clumps of waxy, grey-green, sharp-leaved stems. <i>Calluna-Arctostaphylos</i> heath has a much more mixed and variegated sward, where the prostrate heather intermingles with shrubs such as bearberry <i>Arctostaphylos alpinus</i>, dwarf juniper, mountain bearberry <i>Arctostaphylos alpinus</i>, mountain crowberry, and trailing azalea <i>Loiselurea procumbens</i>.</li> </ul>
<ul style="list-style-type: none"> <li>All of the above types are home to an array of small montane species such as stiff sedge <i>Carex bigelowii</i>, Alpine Clubmoss <i>Diphasiastrum alpinum</i>, dwarf willow <i>Salix herbacea</i> and bog bilberry <i>Vaccinium uliginosum</i>, as well as other diminutive upland plants such as Fir Clubmoss <i>Huperzia selago</i>, eyebright <i>Euphrasia officinalis</i> and tormentil <i>Potentilla erecta</i>.</li> </ul>
<b>Other montane heaths</b>
<ul style="list-style-type: none"> <li>The <i>Vaccinium myrtillus-Rubus chamaemorus</i> community is not a prostrate heath, but has a very short sward of heather or bilberry/blaeberry or both, growing with bog bilberry, cowberry <i>Vaccinium vitis-idaea</i>, mountain crowberry, stiff sedge and, in many examples, cloudberry <i>Rubus chamaemorus</i> and dwarf cornel <i>Cornus suecica</i>. It is a damp heath with much <i>Sphagnum capillifolium</i> in the richly-coloured underlay of large mosses.</li> </ul>
<ul style="list-style-type: none"> <li>Some examples of the upland heath types <i>Calluna vulgaris-Vaccinium myrtillus</i>, <i>Vaccinium myrtillus-Deschampsia flexuosa</i>, and <i>Scirpus cespitosus-Erica tetralix</i> also occur in the montane zone and include montane species.</li> </ul>

### Summit heaths

The vegetation of high summits, ridges and plateaux consists of distinctive plants that can tolerate extreme environments.



**Table 1.4.** Vegetation types associated with summit heaths.

<b>Types of vegetation on summit heaths</b>
<ul style="list-style-type: none"> <li>The most widespread and extensive summit heath is <i>Carex-Racomitrium</i> heath. This is commonly known as 'Racomitrium heath' and it clothes large areas of high montane ground in a deep, soft, even, golden-green, carpet of <i>Racomitrium lanuginosum</i> moss. In a few places the dominant moss is <i>Racomitrium ericoides</i>. This heath varies from species-poor forms, with little other than <i>Racomitrium</i> moss and stiff sedge, to herb-rich forms, with species like Alpine bistort <i>Persicaria vivipara</i>, Alpine lady's mantle <i>Alchemilla alpina</i>, cyphel <i>Minuartia sedoides</i>, moss campion <i>Silene acaulis</i>, thrift <i>Armeria maritima</i>, and, in some localities, scarce species such as Alpine saw-wort <i>Saussurea alpina</i>, mountain chickweed <i>Cerastium cerastioides</i>, and the mosses <i>Hypnum hamulosum</i> and <i>Aulacomnium turgidum</i>. These herb-rich moss heaths are delightful in summer, when the warm air can be alive with insects, drawn to the nectar of small, bright flowering herbs set against the background moss carpet.</li> </ul>
<ul style="list-style-type: none"> <li>Some high altitude <i>Juncus squarrosus-Festuca ovina</i> grassland swards can be classed as montane heath, where they include montane species. These generally occur on thin peat, where they may be an anthropogenic replacement for montane blanket bog.</li> </ul>
<ul style="list-style-type: none"> <li>On the stony wildernesses of the highest summits, there are even more attenuated plant communities. These include thin swards of the three-leaved rush <i>Juncus trifidus</i> growing in small clumps or circular patches, together with dwarf willow, stiff sedge, <i>Racomitrium lanuginosum</i> and lichens. On some of the higher summits, lichen-dominated heaths occur. These consist of carpets of lichens, such as <i>Alectoria nigricans</i>, <i>Cetraria islandica</i>, <i>Cladonia arbuscula</i> and <i>Coelocaulon aculeatum</i>, growing in pale patches dotted with bilberry/blaeberry, stiff sedge and dwarf willow.</li> </ul>
<ul style="list-style-type: none"> <li>On high montane plateaux snow beds, where the snow is late-lying and the soils are damp, <i>Carex-Polytrichum</i> sedge heath occurs. This resembles grassland from a distance, but actually consists of dense swards of stiff sedge with its distinctive black flower heads.</li> </ul>
<ul style="list-style-type: none"> <li>Finally, fell-fields form an unusual type of vegetation that occurs on wind-exposed ridges and summits covered by fine gravel. At first glance they appear devoid of vegetation, but a few species are at home here, such as viviparous sheep's-fescue <i>Festuca vivipara</i>, Alpine lady's mantle, wild thyme <i>Thymus polytrichus</i>, starry saxifrage <i>Saxifraga stellaris</i>, great wood-rush <i>Luzula sylvatica</i>, and mosses such as <i>Oligotrichum hercynicum</i>, <i>Polytrichum piliferum</i> and, on basalt, <i>Racomitrium ellipticum</i>.</li> </ul>

### **Montane grasslands**

The most extensive habitat in the high mountain zone is montane grassland. This near-natural vegetation occurs above the tree-line, where the snow lies too late or too deep for dwarf shrubs to survive. Such grassland characteristically forms large continuous tracts, across summit plateaux and the tops of higher summits and ridges. The flora is characterised by a strong montane element, including several uncommon vascular plants, mosses and liverworts. It is also the most important habitat for Eurasian dotterel *Charadrius morinellus*, Britain's only montane wading bird. The vegetation is represented by a range of grassland types whose composition is influenced by contrasting extremes of exposure and snow-lie.

**Table 1.5.** Vegetation types associated with montane grassland.

<b>Types of montane grassland</b>
<ul style="list-style-type: none"> <li>• Most widespread are the <i>Nardus stricta-Carex bigelowii</i> snow-bed grasslands and the <i>Deschampsia cespitosa-Galium saxatile</i> grasslands. The first is the most extensive and conspicuous, with the component matgrass and stiff sedge forming pale swards in spring as the melting snow exposes the remains of last year's leaves.</li> </ul>
<ul style="list-style-type: none"> <li>• In addition, in the high north-facing corries of the Cairngorms, patches of montane snow-bed grasslands are dominated by wavy hair-grass <i>Deschampsia flexuosa</i>, growing in a dense, dark-green sward.</li> </ul>
<ul style="list-style-type: none"> <li>• There are also sub-communities of the largely sub-montane <i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland and <i>Nardus stricta-Galium saxatile</i> grasslands that can occur in the montane zone and include montane species, such as stiff sedge, dwarf willow and Alpine Clubmoss <i>Diphasiastrum alpinum</i>. These, however, are generally an anthropogenic replacement in which grasses have been increased by grazing, trampling and manuring.</li> </ul>
<ul style="list-style-type: none"> <li>• Finally, late-lie snow-bed communities dominated by bryophytes and dwarf-herbs are included within this habitat.</li> </ul>

### **Snow-bed vegetation**

Snow-bed vegetation is characteristic of extreme places, where snow lies throughout the winter and into spring or even late summer. It normally includes an array of species that are common to all the snow beds, such as Alpine Clubmoss, dwarf cudweed *Gnaphalium supinum*, dwarf willow, stiff sedge, starry saxifrage, and heath bedstraw *Galium saxatile*, in addition to bryophytes such as *Conostomum tetragonum*, *Polytrichum alpinum*, and *Racomitrium ericoides*.

**Table 1.6.** Vegetation types associated with snow-bed vegetation.

<b>Types of late snow-bed vegetation</b>
<ul style="list-style-type: none"> <li>• <i>Moss-dominated snow-beds.</i> These are partially described by the <i>Polytrichum sexangulare-Kiaeria starkei</i> snow-bed community. They consist of a short, tufted, green turf of montane moss species, such as <i>Polytrichum sexangulare</i>, <i>Kiaeria falcata</i>, and <i>Andreaea alpina</i>, which are more-or-less confined to this habitat, and others, such as <i>Dicranum fuscescens</i>, <i>Oligotrichum hercynicum</i> and <i>Racomitrium heterostichum</i>, which are less exacting. Around the upper rims of corries, such snow-beds are classified by deep golden patches of the moss <i>Rhytidiadelphus loreus</i>. Many other snow-beds consist of distinctive emerald-green swards of <i>Pohlia ludwigii</i>.</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Liverwort-dominated snow-beds.</i> These appear un-vegetated to the uninitiated, so tiny are the plants. The miniature liverworts form a thin crust over the ground surface, with up to eight different species in a square centimetre! Typical species include <i>Anthelia juratzkana</i>, <i>Barbilophozia floerkei</i>, <i>Gymnomitrium concinatum</i>, <i>Lophozia sudetica</i> and <i>Marsupella alpina</i>.</li> </ul>
<ul style="list-style-type: none"> <li>• The remaining snow-beds have a richer array of vascular plants growing with mixtures of mosses and liverworts. The scattering of flowers makes the community easy to pick out in summer. They are encompassed by the <i>Alchemilla alpina-Sibbaldia procumbens</i> dwarf-herb community and part of the <i>Salix herbacea-Racomitrium heterostichum</i> snow-bed sub-community. Typical species include Alpine bistort, Alpine lady's mantle, creeping sibbaldia <i>Sibbaldia procumbens</i>, moss campion, and spiked woodrush <i>Luzula spicata</i>.</li> </ul>
<ul style="list-style-type: none"> <li>• It is also common to find expansive snow-bed vegetation, consisting of assemblages of typical snow-bed species together with the fern <i>Cryptogramma crispa</i>, the grasses <i>Festuca vivipara</i>, <i>Nardus stricta</i>, <i>Deschampsia flexuosa</i> and <i>Deschampsia cespitosa</i>, and plants such as three-leaved rush, hard fern <i>Blechnum spicant</i> and alpine marsh violet <i>Viola palustris</i>.</li> </ul>

### **Montane willow scrub**

This is a distinctive habitat that supports many rare plants and animals of northern latitudes and high mountains. It incorporates a mixture of sub-arctic and alpine willow species:

- Downy willow *Salix lapponum* is the most widespread and abundant. Other, less frequent, species include mountain willow *Salix arbuscula*, whortle-leaved willow *Salix myrsinites*, and woolly willow *Salix lanata*.

These montane willows are very sensitive to browsing. The habitat is, therefore, limited to inaccessible ledges and slopes, with damp, skeletal soils. Most individual stands are fragmentary and cover barely more than a few square metres. At its best this is a magnificent community, with the willows forming a low, contorted, silvery canopy on wet ledges streaming with water.

The ground flora beneath the willows varies considerably depending on the soil base-status and irrigating water:

- On more acidic sites, bilberry/blaeberry *Vaccinium myrtillus* and bog bilberry *Vaccinium uliginosum*, typically grow through a mat of mosses, dotted with species such as Alpine bistort, Alpine lady's mantle, great wood-rush and hard fern.
- On more base-rich rocks, this can be an extravagantly herb-rich community, with a luxuriant array of ferns and tall flowering herbs such as globe-flower *Trollius europaeus*, meadowsweet *Filipendula ulmaria*, rose-root *Sedum rosea*, smooth lady's-mantle *Alchemilla glabra*, wild angelica *Angelica sylvestris*, water avens *Geum rivale*, and wood cranesbill *Geranium sylvaticum*. Together, these form the sort of colourful, exuberant display more usually associated with herbaceous borders than high mountain cliffs.
- *Saxifraga aizoides*-*Alchemilla glabra* banks form a related community of steep, wet montane slopes. It can also be breathtakingly attractive, with dripping mats of yellow and purple saxifrage *Saxifraga aizoides*/*S. oppositifolia*, spangled with small plants such as Alpine bistort, Alpine meadow-rue *Thalictrum alpinum*, Alpine lady's mantle, lesser clubmoss *Selaginella selaginoides* and smooth lady's-mantle.

### **Important species**

In addition to supporting a variety of rare types of vegetation, montane heaths and willow scrub are home to many rare and local arctic-alpine plants and invertebrates. These include:

- *Amara alpine* and *Phyllodecta polaris* beetles;
- *Micaria alpine* and *Tricca alpigena* spiders;
- Netted mountain *Macaria carbonaria* and Scotch burnet *Zygaena exulans* ssp. *Subochracea* moths;
- Norwegian mugwort *Artemisia norvegica* and Whortle-leaved willow *Salix myrsinites*;
- Northern prongwort *Herbertus borealis* moss;
- Sub-arctic willow scrub and willow snowbeds.

It also provides important nesting habitat for other important upland birds, including dotterel, ptarmigan, purple sandpiper and snow bunting. The golden eagle and peregrine use these montane habitats as part of their feeding range.

## **1.6 Upland Calcareous Grassland**

Upland calcareous grasslands occur on shallow, lime-rich soils. Most examples are found above the upper limit of agricultural enclosure, in both the sub-montane and montane zones. They also occur within unenclosed moorland at lower elevations, and, in north-west Scotland, descend to sea level.

These grasslands typically occur as a mosaic with other habitat types. They are generally managed as rough grazing for domestic livestock. The sward is generally short, species-rich, and formed from grasses, mosses, sedges, and a high proportion and variety of herbs - as indicated in the box below. Some sites, however, occur over more broken, rocky ground, which is less heavily grazed and has a taller, tussocky, and sometimes more open sward. This is a relatively rare habitat that supports a wide range of uncommon species.

**Table 1.7.** Characteristic plants of upland calcareous grassland.

Characteristic plants
<ul style="list-style-type: none"> <li>• <b>Grasses.</b> Blue moor-grass <i>Sesleria caerulea</i> [<i>Sesleria albicans</i>]; brown bent <i>Agrostis vinealis</i>; common bent <i>Agrostis capillaris</i>; crested hair-grass <i>Koeleria macrantha</i>; heath-grass <i>Danthonia decumbens</i>; mat-grass <i>Nardus stricta</i>; meadow oat-grass <i>Helictotrichon pratense</i>; quaking-grass <i>Briza media</i>; red and sheep's fescue <i>Festuca rubra/ovina</i>; sweet vernal grass <i>Anthoxanthum odoratum</i></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Sedges and sedge-like plants.</b> Carnation sedge <i>Carex panicea</i>; false sedge <i>Kobresia simpliciuscula</i>; flea sedge <i>Carex pulicaris</i>; glaucous sedge <i>Carex flacca</i>; hair sedge <i>Carex capillaris</i>; spring sedge <i>Carex caryophylla</i></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Herbs.</b> Alpine lady's mantle <i>Alchemilla alpina</i>; common bird's-foot-trefoil <i>Lotus corniculatus</i>; common dog-violet <i>Viola riviniana</i>; common rock-rose <i>Helianthemum nummularium</i>; cyphel <i>Minuartia sedoides</i>; fairy flax <i>Linum catharticum</i>; harebell <i>Campanula rotundifolia</i>; heath bedstraw <i>Galium saxatile</i>; limestone bedstraw <i>Galium sternerii</i>; moss campion <i>Silene acaulis</i>; mossy saxifrage <i>Saxifraga hypnoides</i>; mountain avens <i>Dryas octopetala</i>; ribwort plantain <i>Plantago lanceolata</i>; selfheal <i>Prunella vulgaris</i>; tormentil <i>Potentilla erecta</i>; wild thyme <i>Thymus praecox</i></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Mosses.</b> Chalk comb-moss <i>Ctenidium molluscum</i>; glittering wood-moss <i>Hylocomium splendens</i>; woolly fringe-moss <i>Racomitrium lanuginosum</i></li> </ul>

### **Types of upland calcareous grasslands**

- **Alpine and subalpine calcareous grasslands.** These occur on lime-rich soils and consist of short, often grazed, species-rich mixtures. Within the UK, this habitat occurs close to sea level, as well as at high altitudes. It is one of the most important upland habitats for rare arctic-alpine plants, and other rare montane or northern plants and animals, including the endemic Scottish primrose *Primula scotica*. Three recognised vegetation communities fall within this grassland group: *Festuca ovina-Alchemilla alpina-Silene acaulis* dwarf herb community; *Dryas octopetala-Carex flacca* heath; and *Dryas octopetala-Silene acaulis* ledge community. In general, such grassland contains a high proportion of arctic-alpine cushion herbs.
- **Upland calcareous dry grasslands and scrublands.** This is a widespread, but localised habitat type on well-drained calcareous soils in England. It also occurs more rarely in Wales, Northern Ireland and Scotland. Swards are generally maintained by grazing, and conspicuous suits of calcicole (calcium-loving) plants are a characteristic feature. Two recognised grassland communities occur within this group: *Sesleria albicans-Galium sternerii* and *Festuca ovina-Agrostis capillaris-Thymus praecox* grasslands. Variation within is mainly dependent on regional climatic conditions, local topography, soil depth and fertility, and grazing
- **Montane species-rich Nardus grasslands.** These tend to develop where localised base-rich flushes occur on siliceous bedrock. The soils have an acidic pH (mainly <6) and are derived from bedrocks with at least some silica. The altitudinal range varies from near sea level to 800–900m up. This is an important habitat that supports a wide range of species, including Atlantic, Sub-Atlantic and Arctic-Alpine plants and invertebrates. Species present in the grassland tend to be those that avoid extreme conditions. Swards are closely grazed and consist of a complex

mosaic of grasses, small herbs and bryophytes. Most of this habitat falls within calcareous grassland communities characterised by *Festuca ovina*-*Agrostis capillaris*-*Alchemilla alpina* or *Festuca ovina*-*Agrostis capillaris*-*Thymus praecox*; the remainder is classed as acidic grassland characterised by *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* or *Nardus stricta*-*Galium saxatile*.

### **Examples of important species found on upland calcareous grasslands**

#### *Bees*

- Northern osmia *Osmia inermis*
- Ruby-tailed wasp *Chrysura hirsuta*
- Tormentil mining bee *Andrena tarsata*
- Wall mason bee *Osmia parietina*

#### *Birds*

- Lapwing *Vanellus vanellus*
- Ring ouzel *Turdus torquatus*
- Skylark *Alauda arvensis arvensis*
- Yellow wagtail *Motacilla flava flavissima*

#### *Butterflies*

- Mountain Ringlet *Erebia epiphron*
- Northern Brown Argus *Aricia artaxerxes*
- Pearl-bordered Fritillary *Boloria euphrosyne*
- Small Blue *Cupido minimus*
- Small Heath *Coenonympha pamphilus*

#### *Flowering plants*

- Arctic sandwort *Arenaria norvegica* subsp. *norvegica*
- Alpine milk-vetch *Astragalus alpinus*
- Cyphel *Minuartia sedoides*
- Field gentian *Gentianella campestris*
- Frog orchid *Coeloglossum viride*
- Purple milk-vetch *Astragalus danicus*
- Small-white orchid *Pseudorchis albida*

#### *Fungi*

- Alpine rust *Puccinia septentrionalis*
- Big blue pinkgill *Entoloma bloxamii*
- Dark-purple earthtongue *Geoglossum atropurpureum*
- Date-coloured waxcap *Hygrocybe spadicea*
- Spignel rust *Nyssopsora echinata*
- Stalked puffball *Tulostoma niveum*

## **1.7 Upland Heathland**

Upland heathland normally occurs above the limit of agricultural enclosure but below the limit of the permanent tree-line, i.e. between 250–400 m and 600–750 m altitude. However, in northern Scotland, it descends to near sea-level. It occurs on substrates that range from thin, stony, well-drained mineral soils to shallow peats <0.5 m, and is characterised by a cover of dwarf shrubs of at least 25%.

The main shrub dwarf shrub species encountered are: heather *Calluna vulgaris*, bearberry *Arctostaphylos uva-ursi*, bell heather *Erica cinerea*, bilberry/blaeberry *Vaccinium myrtillus*, cowberry *Vaccinium vitis-idaea*, cross-leaved heath *Erica tetralix*, crowberry *Empetrum nigrum*, dwarf gorse *Ulex minor*, gorse *Ulex europaeus*, and western gorse *Ulex gallii*. Some upland heath supports abundant juniper *Juniperus communis*.

Upland heathland vegetation is sub-divided into two broad types:

### **Wet upland heathland**



Wet upland heathland usually occurs on soils with impeded drainage that are acidic and nutrient-poor, such as shallow peats or sandy soils. It is found widely across the uplands of the UK, but is particularly abundant in the western Scottish Highlands and Islands.

The typical form of this habitat is *Scirpus cespitosus*-*Erica tetralix* wet heath. This occurs where rainfall is moderate to high in the north and west of the UK. The vegetation shows wide variation in the pattern of dominance. Most stands comprise mixtures of purple moor-grass *Molina caerulea*, deer-grass *Trichophorum cespitosum*, cross-leaved heath *Erica tetralix*, and/or heather *Calluna vulgaris*, though one or more may be lacking entirely. Bell heather *Erica cinerea*, bilberry/blaeberry *Vaccinium myrtillus*, bog myrtle *Myrica gale*, *Sphagnum* bog-mosses, round-leaved sundew *Drosera rotundifolia*, bog asphodel *Narthecium ossifragum*, common cotton-grass *Eriophorum angustifolium*, mat grass *Nardus stricta* and heath rush *Juncus squarrosus* are important in particular sub-communities. In the north, there may be a high cover of *Cladonia* lichens, whilst in the far north-west of Scotland, woolly fringe-moss *Racomitrium lanuginosum* and an abundance of Atlantic bryophytes is characteristic.

Where conditions are drier, *Erica tetralix*-*Sphagnum compactum* wet heath is characteristic. This is usually dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, and purple moor-grass *Molina caerulea*. The bog-moss *Sphagnum compactum* is typically abundant. At high altitude in the Scottish Highlands, *Cladonia* lichens are abundant. Similar 'wet heath' vegetation occurs on blanket bog.

### **Dry & humid upland heathland**

Dry & humid upland heathland is typically associated with free-draining, low nutrient, acidic to circum-neutral soils. Nearly all of it originates from woodland, which has been heavily grazed and burnt. Most is still grazed by livestock and deer, and many sites are used for grouse shooting. Although it also occurs widely across the uplands of the UK, it tends to have a less oceanic, more easterly distribution compared to wet upland heath. A number of dry & humid upland heath vegetation types have been recognised – summary details of which are given in the table below. Some of these types also occur in Mountain Heaths and Lowland Heathland.



**Table 1.8.** Dry and humid upland heath vegetation types

NVC type	Main locations	Major plants
H4 <i>Ulex gallii</i> - <i>Agrostis curtisii</i> heath	SW England	Heather <i>Calluna vulgaris</i> , bristle bent <i>Agrostis curtisii</i> , western gorse <i>Ulex gallii</i> , purple moor-grass <i>Molina caerulea</i> , bell heather <i>Erica cinerea</i> , cross-leaved heath <i>Erica tetralix</i> , tormentil <i>Potentilla erecta</i>
H8 <i>Calluna vulgaris</i> - <i>Ulex gallii</i> heath	SW England, W Wales, S Pennines	Heather <i>Calluna vulgaris</i> , western gorse <i>Ulex gallii</i> , bell heather <i>Erica cinerea</i>
H9 <i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath	S Pennines & North York Moors	Heather <i>Calluna vulgaris</i> , wavy hair-grass <i>Deschampsia flexuosa</i>
H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	Widespread, but especially SW Scotland	Heather <i>Calluna vulgaris</i> , bell heather <i>Erica cinerea</i> , tormentil <i>Potentilla erecta</i>
H12 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath	Widespread, but especially central & E Scotland	Heather <i>Calluna vulgaris</i> , bilberry/blueberry <i>Vaccinium myrtillus</i> , various mosses, cowberry <i>Vaccinium vitis-idaea</i> , crowberry <i>Empetrum nigrum</i> , bell heather <i>Erica cinerea</i>
H16 <i>Calluna vulgaris</i> - <i>Arctostaphylos uva-ursi</i> heath	E-central Scotland	Heather <i>Calluna vulgaris</i> , bearberry <i>Arctostaphylos uva-ursi</i> , bell heather <i>Erica cinerea</i> , cowberry <i>Vaccinium vitis-idaea</i> , various mosses/lichens, wavy hair-grass <i>Deschampsia flexuosa</i>
H18 <i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath	Widespread, but especially N Scotland	Bilberry/blueberry <i>Vaccinium myrtillus</i> , wavy hair-grass <i>Deschampsia flexuosa</i> , heath bedstraw <i>Galium saxatile</i> , various mosses
H21 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath	Lake District, NW Scotland	Heather <i>Calluna vulgaris</i> , bilberry/blueberry <i>Vaccinium myrtillus</i> , wavy hair-grass <i>Deschampsia flexuosa</i> , various mosses, tormentil <i>Potentilla erecta</i>

The fauna of upland heathland includes a variety of scarce and threatened bees, beetles, birds, butterflies, mammals, moths, reptiles and spiders. These include the moss carder-bee *Bombus muscorum*, the argent & sable moth *Rheumaptera hastata* ssp. *nigrescens*, the ring ouzel *Turdus torquatus*, and the mountain ringlet butterfly *Erebia epiphron*. Nevertheless, this habitat tends to lack the rich association of animals that characterises Lowland Heathland.

## 2 Correspondences between UK Upland Habitat Types

The table below shows how the different upland habitat types recognised by the mainstream habitat classifications in the UK relate to each other. The types included are those recognised under the UK Biodiversity Action Plan (UK BAP), the EU Habitats Directive, and the British National Vegetation Classification (NVC).

The table shows only how the types broadly fit together – some examples of the types shown may fit into other vegetation/habitat types. For more detailed information see the [habitat correspondences interactive spreadsheet](#) (though not all the types shown below are covered by this). The definitions of the NVC types are available in the five-volume

publication entitled [British Plant Communities](#), with summary information given in the [Illustrated Guide to British Upland Vegetation](#) and the [NVC field guide to mires and heaths](#).

**Table 2.1.** Correspondences between UK upland habitat types (created 2010).

UK BAP priority habitats	EU Habitats Directive Annex I habitats	National Vegetation Classification type
Blanket bog	<b>H7130</b> Blanket Bogs	M1 <i>Sphagnum auriculatum</i> bog pool community
		M2 <i>Sphagnum cuspidatum/recurvum</i> bog pool community
		M3 <i>Eriophorum angustifolium</i> bog pool community
		M15 <i>Scirpus cespitosus-Erica tetralix</i> wet heath
		M17 <i>Scirpus cespitosus-Eriophorum vaginatum</i> blanket mire
		M18 <i>Erica tetralix-Sphagnum papillosum</i> raised and blanket mire
		M19 <i>Calluna vulgaris-Eriophorum vaginatum</i> blanket mire
		M20 <i>Eriophorum vaginatum</i> blanket and raised mire
		M25 <i>Molinia caerulea-Potentilla erecta</i> mire
	<b>H7140</b> Transition mires and quaking bogs	M2 <i>Sphagnum cuspidatum/recurvum</i> bog pool community
		M4 <i>Carex rostrata-Sphagnum recurvum</i> mire
		M5 <i>Carex rostrata-Sphagnum squarrosum</i> mire
		M8 <i>Carex rostrata-Sphagnum warnstorffii</i> mire
		M9 <i>Carex rostrata-Calliergon cuspidatum / giganteum</i> mire
		M29 <i>Hypericum elodes-Potamogeton polygonifolius</i> soakway
		S27 <i>Carex rostrata-Potentilla palustre</i> tall herb fen
	<b>H7150</b> Depressions on peat substrates of the <i>Rhynchosporion</i>	M1 <i>Sphagnum auriculatum</i> bog pool community
		M2 <i>Sphagnum cuspidatum/recurvum</i> bog pool community
		M15 <i>Scirpus cespitosus-Erica tetralix</i> wet heath
		M16 <i>Erica tetralix-Sphagnum compactum</i> wet heath
		M17 <i>Scirpus cespitosus-Eriophorum vaginatum</i> blanket mire
		M18 <i>Erica tetralix-Sphagnum papillosum</i> raised and blanket mire
		M21 <i>Narthecium ossifragum-Sphagnum papillosum</i> valley mire
		M29 <i>Hypericum elodes-Potamogeton polygonifolius</i> soakway



UK BAP priority habitats	EU Habitats Directive Annex I habitats	National Vegetation Classification type
Inland rock outcrop and scree habitats	<b>H6430</b> Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	U17 <i>Luzula sylvatica</i> - <i>Geum rivale</i> tall herb community
	<b>H8110</b> Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> )	U18 <i>Cryptogramma crisper</i> - <i>Athyrium distentifolium</i> snow-bed
		U21 <i>Cryptogramma crisper</i> - <i>Deschampsia flexuosa</i> community
	<b>H8120</b> Calcareous and calcshist screes of the montane to alpine levels ( <i>Thalaspiaetea rotundifolii</i> )	OV38 <i>Gymnocarpium robertianum</i> - <i>Arrhenatherum elatius</i> community
	<b>H8210</b> Calcareous rocky slopes with chasmophytic vegetation	OV39 <i>Asplenium trichomanes</i> - <i>Asplenium rutamuraria</i> community
		OV40 <i>Asplenium viride</i> - <i>Cystopteris fragilis</i> community
	<b>H8220</b> Siliceous rocky slopes with chasmophytic vegetation	U18 <i>Cryptogramma crisper</i> - <i>Athyrium distentifolium</i> snow-bed
U21 <i>Cryptogramma crisper</i> - <i>Deschampsia flexuosa</i> community		
Not covered	U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	
Limestone pavements	<b>H8240</b> Limestone Pavements	CG9 <i>Sesleria albicans</i> - <i>Galium sternerii</i> grassland
		CG10 <i>Festuca ovina</i> - <i>Agrostis capillaries</i> - <i>Thymus praecox</i> grassland
		CG13 <i>Dryas octopetala</i> - <i>Carex flacca</i> heath
		M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire
		M26 <i>Molinia caerulea</i> - <i>Crepis paludosa</i> mire
		M27 <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> mire
		MG5 <i>Cynosurus cristatus</i> - <i>Centaurea nigra</i> grassland
		OV38 <i>Gymnocarpium robertianum</i> - <i>Arrhenatherum elatius</i> community
		OV39 <i>Asplenium trichomanes</i> - <i>Asplenium rutamuraria</i> community
		OV40 <i>Asplenium viride</i> - <i>Cystopteris fragilis</i> community
		W8 <i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland
		W9 <i>Fraxinus excelsior</i> - <i>Sorbus aucuparia</i> - <i>Mercurialis perennis</i> woodland
		W13 <i>Taxus baccata</i> woodland
		W19 <i>Juniperus communis</i> ssp. <i>communis</i> - <i>Oxalis acetosella</i> woodland
W21 <i>Crataegus monogyna</i> - <i>Hedera helix</i> scrub		

UK BAP priority habitats	EU Habitats Directive Annex I habitats	National Vegetation Classification type
Mountain heaths and willow scrub	<b>H4060</b> Alpine and boreal heaths	H13 <i>Calluna vulgaris-Cladonia arbuscula</i> heath
		H14 <i>Calluna vulgaris-Racomitrium lanuginosum</i> heath
		H15 <i>Calluna vulgaris-Juniperus communis</i> ssp. <i>nana</i> heath
		H17 <i>Calluna vulgaris-Arctostaphylos alpinus</i> heath
		H18 <i>Vaccinium myrtillus-Deschampsia flexuosa</i> heath
		H19 <i>Vaccinium myrtillus-Cladonia arbuscula</i> heath
		H20 <i>Vaccinium myrtillus-Racomitrium lanuginosum</i> heath
		H22 <i>Vaccinium myrtillus-Rubus chamaemorus</i> heath
	<b>H4080</b> Sub-Arctic <i>Salix</i> scrub	W20 <i>Salix lapponum-Luzula sylvatica</i> scrub
	<b>H6150</b> Siliceous alpine and boreal grassland	U7 <i>Nardus stricta-Carex bigelowii</i> grass heath
		U8 <i>Carex bigelowii-Polytrichum alpinum</i> sedge heath
		U9 <i>Juncus trifidus-Racomitrium lanuginosum</i> rush heath
		U10 <i>Carex bigelowii-Racomitrium lanuginosum</i> moss heath
		U11 <i>Polytrichum sexangulare-Kiaeria starkei</i> snow-bed
		U12 <i>Salix herbacea-Racomitrium heterostichum</i> snow-bed
Not covered	U13 <i>Deschampsia cespitosa-Galium saxatile</i> grassland	
	U15 <i>Saxifraga aizoides-Alchemilla glabra</i> banks	
Upland calcareous grassland	<b>H6170</b> Alpine and subalpine calcareous grasslands	CG12 <i>Festuca ovina-Alchemilla alpina-Silene acaulis</i> dwarf herb community
		CG13 <i>Dryas octopetala-Carex flacca</i> heath
		CG14 <i>Dryas octopetala-Silene acaulis</i> ledge community
	<b>H6210</b> Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> )	CG9 <i>Sesleria albicans-Galium sternerii</i> grassland
		CG10 <i>Festuca ovina-Agrostis capillaris-Thymus praecox</i> grassland

UK BAP priority habitats	EU Habitats Directive Annex I habitats	National Vegetation Classification type
Upland calcareous grassland	<b>H6230</b> Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)	CG10 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Thymus praecox</i> grassland
		CG11 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Alchemilla alpina</i> grassland
		U4 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Galium saxatile</i> grassland
		U5 <i>Nardus stricta</i> - <i>Galium saxatile</i> grassland
Upland flushes, fens and swamps	<b>H7140</b> Transition mires and quaking bogs	M2 <i>Sphagnum cuspidatum</i> /recurvumbog pool community
		M4 <i>Carex rostrata</i> - <i>Sphagnum recurvum</i> mire
		M5 <i>Carex rostrata</i> - <i>Sphagnum squarrosum</i> mire
		M8 <i>Carex rostrata</i> - <i>Sphagnum warnstorffii</i> mire
		M9b <i>Carex rostrata</i> - <i>Calliergon cuspidatum</i> / <i>giganteum</i> mire, <i>Carex diandra</i> - <i>Calliergon giganteum</i> sub-community
		M14 <i>Schoenus nigricans</i> – <i>Narthecium ossifragum</i> mire
		M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath
		M29 <i>Hypericum elodes</i> - <i>Potamogeton polygonifolius</i> soakway
	S27 <i>Carex rostrata</i> - <i>Potentilla palustre</i> tall herb fen	
	<b>H7220</b> Petrifying springs with tufa formation	M37 <i>Cratoneuron commutatum</i> - <i>Festuca rubra</i> spring
		M38 <i>Cratoneuron commutatum</i> - <i>Carex nigra</i> spring
	<b>H7230</b> Alkaline fens	M9 <i>Carex rostrata</i> - <i>Calliergon cuspidatum</i> / <i>giganteum</i> mire
		M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire
		M13 <i>Schoenus nigricans</i> - <i>Juncus subnodulosus</i> mire
		M14 <i>Schoenus nigricans</i> - <i>Narthecium ossifragum</i> mire
		S24 <i>Phragmites australis</i> - <i>Peucedanum palustre</i> tall-herb fen
	<b>H7240</b> Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire
		M11 <i>Carex demissa</i> - <i>Saxifraga aizoides</i> mire
		M12 <i>Carex saxatilis</i> mire
		M34 <i>Carex demissa</i> - <i>Koenigia islandica</i> flush
Upland heathland	<b>H4010</b> Northern Atlantic wet heaths with <i>Erica tetralix</i>	M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath
		M16 <i>Erica tetralix</i> - <i>Sphagnum compactum</i> wet heath

UK BAP priority habitats	EU Habitats Directive Annex I habitats	National Vegetation Classification type
Upland heathland	<b>H4030</b> European dry heaths	H4 <i>Ulex gallii</i> - <i>Agrostis curtisii</i> heath
		H8 <i>Calluna vulgaris</i> - <i>Ulex gallii</i> heath
		H9 <i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath.
		H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath
		H12 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath
		H16 <i>Calluna vulgaris</i> - <i>Arctostaphylos uva-ursi</i> heath
		H18 <i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath
		H21 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath
Calaminarian grassland	<b>H6130</b> Calaminarian grasslands of the <i>Violetalia calaminariae</i>	OV37 <i>Festuca ovina</i> - <i>Minuartia verna</i> community

### 3 Extent & Distribution of UK Upland Habitats

The tables below give information on the extent (area covered) and distribution of upland habitats around the UK. The most extensive upland habitats are blanket bog and upland heathland covering around 3.3 million hectares combined. Although these habitats occur mostly in Scotland, sizeable areas are also found in the uplands of England, Northern Ireland and Wales.

The other upland habitats are, in comparison, far more limited in extent. Two occur mainly in the Scottish uplands – mountain heaths and willow scrub, and inland rock outcrop and scree habitats. Upland calcareous grassland occurs mainly in England, as does limestone pavement, although this is a far more localised habitat. Calaminarian grassland is a scarce habitat mainly found in the English and Scottish uplands.

#### 3.1 UK BAP habitats

The table below shows the estimated extent of four upland priority habitat types recognised by the UK Biodiversity Action Plan. The values are based mainly on information extracted from the [Biodiversity Action Reporting System \(BARS\)](#).

**Table 3.1.** Estimated extent (in 2008) of the upland priority habitats recognised by the UK BAP.

UK BAP priority habitats*	England (ha)	Scotland (ha)	Wales (ha)	Northern Ireland (ha)	United Kingdom (ha)
Blanket bog	255,308	1,759,000	70,000	139,796	2,224,104
Upland heathland	243,929	778,000	80,000	11,059	1,112,988
Upland calcareous grassland	12,293	5,000	700	936	18,929
Limestone pavement	2,553	300	54	220	3,127
Calaminarian grassland [part of this habitat occurs in the lowlands, but most is in the Scottish uplands]	<200	<200	50	–	<450

\* information on the extent of the following UK BAP priority habitats is not available: (i) inland rock outcrop and scree habitats; (ii) mountain heaths and willow scrub; and (iii) upland flushes, fens and swamps

### 3.2 EU Habitats Directive Annex I types

The table below shows the estimated extent of habitats on Annex I of the EU Habitats Directive that occur in UK upland areas. Note that for habitats that occur in both the uplands and lowlands, the area specific to the uplands has not been determined.

**Table 3.2.** Estimated extent (in 2013) of the upland habitat types listed under Annex 1 of the EU Habitats Directive (derived from the 2013 UK Report on Implementation of the Habitats Directive).

EU Habitats Directive Annex I types)	England (ha)	Scotland (ha)	Wales (ha)	Northern Ireland (ha)	UK (ha)
<b>Blanket bog and upland flushes, fens and swamps</b>					
H7130 Blanket Bogs	244,536	1,759,000	53,200	140,000	2,196,736
H7140 Transition mires and quaking bogs [a small part of this habitat occurs in lowland wetland areas]	2,850	1,420	336	50	>4,656*
H7150 Depressions on peat substrates of the <i>Rhynchosporion</i> [a small part of this habitat occurs in lowland heathland/wetland areas]	>428*	>781*	17	unknown	>1,226*
H7230 Alkaline fens [a small part of this habitat occurs in lowland wetland areas]	2,800	370	120	40	3,330
H7240 Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	6	70	3	–	79
H7220 Petrifying springs with tufa formation	unknown	46	6	1	>53
<b>Upland heathland</b>					
H4030 European dry heaths [a small part of this habitat occurs in lowland heathland areas]	320,000	479,000	77,740	16,800	893,540

EU Habitats Directive Annex I types)	England (ha)	Scotland (ha)	Wales (ha)	Northern Ireland (ha)	UK (ha)
H4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> [a small part of this habitat occurs in lowland heathland areas]	25,000	370,000	14,414	58,300	467,714
<b>Mountain heaths and willow scrub</b>					
H6150 Siliceous alpine and boreal grassland	1,078	70,000	84	60	71,222
H4060 Alpine and boreal heaths	1,232	41,000	35	80	42,347
H4080 Sub-Arctic <i>Salix</i> scrub	1	23	–	–	24
<b>Inland rock outcrop and scree</b>					
H8110 Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladanii</i> )	3,250	60,000	317	100	63,667
H8220 Siliceous rocky slopes with chasmophytic vegetation	1,250	37,500	1,200	100	40,050
H8210 Calcareous rocky slopes with chasmophytic vegetation	300	110	270	20	700
H8120 Calcareous and calcshist screes of the montane to alpine levels ( <i>Thalaspiaetea rotundifolii</i> )	400	150	34	20	604
H6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	7	200	65	15	287
<b>Upland calcareous grassland</b>					
[H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates ( <i>Festuco-Brometalia</i> ) [most of this habitat occurs in the lowlands]	[48,700]	[270]	[741]	[936]	[50,647]
H6230 Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)	349	4,600	138	40	5,127
H6170 Alpine and subalpine calcareous grasslands	–	680	2	–	682
<b>Limestone pavement</b>					
H8240 Limestone pavements	1,978	300	75	220	2,573
<b>Calaminarian grassland</b>					
H6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i> [part of this habitat occurs in the lowlands, but most is in the Scottish uplands]	200	80	49	–	329

\* minimum value based on or partly on the area of the habitat with SACs

## 4 Threats to UK Upland Habitats

UK upland habitats and their associated species are threatened by a range of factors. Over the last century, all semi-natural upland habitats have been reduced in extent and suffered degradation due to a combination of afforestation, air pollution, built development, improvement for agriculture/game rearing, inappropriate grazing or burning, peat extraction, quarrying, recreation and other factors. Encouragingly, the impact of many of these has been reduced in recent times.

The table below provides a summary of major pressures and threats to UK upland habitats – details are given beneath. These are based on information in the 3rd UK Report on Implementation of the Habitats Directive, the UK Biodiversity Habitat Action Plans, and Common Standards Monitoring for Designated Sites: First Six Year Report.

### 4.1 Afforestation

Large areas of blanket bog and upland heath have been lost due to afforestation, mainly with non-native conifers and including site drainage. This practice has been greatly reduced in recent times, and some areas of afforested bog and heathland are undergoing restoration after the first rotation of conifers. Some maturing plantations are, nevertheless, having an impact on the hydrology and species composition of adjacent blanket bogs, and full restoration is a problematic and long-term process. In addition, some wooded limestone pavements have been adversely affected by planting of conifers or beech. As these mature, they can heavily shade the ground and create an inhospitable deep, slowly decaying layer of needles or leaves.

### 4.2 Air pollution

Air pollution is a widespread threat affecting upland habitats. Many of the key species and ecological conditions are highly sensitive to nitrogen and acid deposition and to direct exposure to high concentrations of ammonia and ozone. Major areas of blanket bog, upland heathland and mountain heath exceed the critical loads for nutrient nitrogen and/or acid deposition. Such pollution alters the composition of the vegetation by encouraging the growth of certain species, whilst other 'sensitive' species decline or are out-competed. For further info: [UK Air Pollution Information System \(APIS\)](#)..

### 4.3 Built development



Wind farms, communication masts and their associated infrastructure (e.g. access tracks) have increasingly become a significant threat to upland heathland and blanket bog, especially at high altitude. There are also threats from hydro-electric schemes in Scotland.

### 4.4 Burning

Burning is a traditional management technique that is used to modify the vegetation mainly for the benefit of livestock, grouse and deer. It is a common practice on upland heathland, but also affects other upland habitat types. Inappropriate burning is a widespread problem in

the uplands. This can arise due to wildfires or from deliberate or accidental burning. It can be very damaging to wildlife habitats, especially if it is combined with over-grazing. The effects are comparable to over-grazing and recovery can also be slow and incomplete. Burning of blanket bog is, in many situations, considered inappropriate. Accidental spread of fires upslope onto mountain heaths is a widespread damaging factor. Burning can also damage the regeneration potential of rocky habitats with skeletal soils and certain kinds of flushes, fens and swamps.

#### **4.5 Erosion**

High altitude blanket bogs in particular, and especially those in the Pennines and South Wales, are suffering from erosion of the underlying peat mass. Some of this may be due to natural processes, but it is exacerbated by factors such as drainage, over-grazing, drying of the climate, and recreation.

#### **4.6 Grazing**

Like many wildlife habitats in the UK, upland habitats usually benefit from a moderate, but not excessive, level of grazing. This may involve cattle, sheep, deer and/or rabbits, and helps maximise vegetation structure and floristic diversity.

Over-grazing (by livestock or wild deer) is, however, a widespread problem in the uplands. This reduces the vegetation, leads to a loss of structure, characteristic species and floristic diversity, encourages the spread of unpalatable plant species, and impoverishes the associated fauna. In extreme cases, trampling can expose the underlying soil and cause instability in scree and soil erosion. Recovery after heavy grazing can be slow and incomplete.

In contrast, some upland habitats suffer from under-grazing, most notably upland flushes, fens and swamps and Calaminarian grassland. Without grazing, rank and scrubby species will invade and spread, leading to a loss of floristic diversity. Calaminarian grassland require more or less continuous grazing by rabbits or sheep, without which soil organic material builds up, with a gradual dilution of the effect of heavy metal contaminants, often resulting in scrub invasion. In this case some form of disturbance may be necessary to maintain soil toxicity.

#### **4.7 Improvement for agriculture/game rearing**

Extensive tracts of blanket bog, as well as some areas of upland wet heath and flush, fen and swamp habitat, have been drained in an attempt to improve their grazing quality (for livestock, grouse or deer). This has been achieved by creating artificial drainage channels known as 'grips'. Gripping is a major cause of unfavourable condition on blanket bogs. It results in the vegetation changing towards drier forms of heathland and degradation of the underlying peat. In places, new grips continue to be dug and existing grips cleaned. Even without maintenance, most grips continue to lower the water table and some initiate erosion. There is a widespread need to reinstate the natural hydrology of many blanket bogs by blocking grips.

Other forms of agricultural improvement, notably conversion of semi-natural vegetation to simple pasture and application of fertilisers and herbicides, have occurred frequently in the past on various upland habitats. This and associated practices, such as intensive winter livestock feeding, remain as locally significant threats to blanket bog, limestone pavements, upland heathland and upland flushes, fens and swamps.



## 4.8 Invasive non-native species

There are a number of non-native plant species with the propensity to invade upland habitats. These include:

- Australian swamp stonecrop and Parrot's feather, which can rapidly colonise and change the ecology of small standing water and wetland habitats;
- New Zealand willow herb, which favours moist, skeletal scree and grassland sites, especially where grazing has favoured open ground;
- Cotoneaster and Buddleja, which are a local problem on limestone pavements.

The impacts of the non-native heather beetle on upland heathland appear to be increasing and may become a bigger problem, possibly linked with climate and atmospheric pollution.

## 4.9 Mineral re-working and land reclamation

Re-working of abandoned mineral veins is a significant threat to some Calaminarian grassland sites. At other sites, such grassland is deliberately 'reclaimed' to remove a source of contamination to livestock or simply to improve the aesthetic appearance of former mining land.

### 4.10 Peat extraction

Peat extraction on blanket bogs has had important local effects. Domestic cutting, most of which has occurred on common land, is locally extensive. Elsewhere, mechanical extraction has been employed for commercial purposes, notably in Northern Ireland. Not only does this directly damage the habitat, but it drains and disrupts the natural hydrological regime.

### 4.11 Quarrying

Removal of surface stone from limestone pavement badly impacted on this habitat in the past. Since the mid-1990s, however, such activity has largely been stopped, save for a small-scale illegal extraction and loss due to built development. Although pressure remains to extend deep quarries onto surviving pavements, this has been prevented by strong development control policies.

### 4.12 Recreation

Many popular walking routes, some of which are also used by cyclists and horse-riders, traverse blanket bog and mountain heath areas, which are very sensitive to such pressure. The increased use of all-terrain vehicles for recreational, agricultural and sporting activities has also resulted in local erosion. Recreational disturbance, such as rock climbing and scree running, has resulted in accelerated erosion on a number of inland rock outcrop and scree habitat sites.





## 5 Condition of UK Upland Habitats

The condition of UK upland habitats has been assessed using Common Standards Monitoring Guidance for Upland Habitats. This involves making an assessment of habitat condition from a nature conservation perspective. It is based on a series of habitat characteristics or attributes and standardised condition categories.

Sites are judged to be in favourable condition when the objectives for the habitat are being met. Sites with habitat that is in an unsatisfactory state are classed as in unfavourable condition. Where this is the case, a judgement is made as to whether the habitat is: (i) recovering – moving towards the desired state; (ii) declining – moving away from the desired state; or (iii) no-change – neither improving nor declining. Sites are classed as destroyed (partially or completely) when the habitat is no longer present and there is no prospect of being able to restore it.

### 5.1 Condition on designated sites

The tables below summarise information on the condition of upland habitats at a UK-level as reported in 2006-07. On sites designated as SSSI/ASSIs, the condition of virtually all the habitat types was mostly either favourable or unfavourable recovering. Nevertheless, a sizeable percentage of each was unfavourable and did not show signs of recovery. The condition of upland habitats on SACs was generally poorer.

Information from SACs on upland habitats recognised under the EU Habitats Directive showed that the condition of these types varied greatly. Although in some cases most of the habitat was in favourable or unfavourable recovering condition, for others a large part was unfavourable with no signs of recovery. Note that the condition of some upland habitats has since improved (e.g. see [The State of the Natural Environment 2008](#)).

#### **Tables of condition of UK upland habitats:**

The tables are based on data from the Common Standards Monitoring for Designated Sites: First Six Year Report (2006) and the 2nd UK Report on Implementation of the Habitats Directive (2007)

**Table 5.1.** Sites designated as SSSI/ASSIs (date from 2006)

	<b>Favourable</b>	<b>Unfavourable recovering</b>	<b>Unfavourable not recovering</b>	<b>Destroyed or part destroyed</b>
Blanket bog	58%	15%	27%	0%
Limestone pavement, inland cliffs and screes	56%	14%	29%	1%
Fens and marshes - upland	46%	18%	34%	2%
Montane grasslands and heaths	45%	10%	45%	0%
Upland calcareous grassland	25%	34%	38%	3%
Upland heathland	21%	28%	48%	3%

**Table 5.2.** Condition of sites designated as Special Areas of Conservation (SAC) (data from 2007).

	Favourable	Unfavourable recovering	Unfavourable not recovering	Destroyed or part destroyed
Limestone pavement, inland cliffs and screes	59%	20%	20%	1%
Fens and marshes - upland	45%	19%	36%	0%
Blanket bog	45%	14%	39%	2%
Montane grasslands and heaths	27%	12%	61%	0%
Upland heathland	19%	21%	57%	3%
Upland calcareous grassland	15%	20%	65%	0%

**Table 5.3.** Sites designated as Special Areas of Conservation (SAC) – broken down into EU Habitats Directive Annex I types

	Favourable	Unfavourable recovering	Unfavourable not recovering
<b>Inland rock, outcrop and scree habitats</b>			
H8220 Siliceous rocky slopes with chasmophytic vegetation	84%	11%	5%
H8120 Calcareous and calcshist screes of the montane to alpine levels ( <i>Thalaspia rotundifolia</i> )	61%	26%	13%
H8110 Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> )	56%	17%	27%
H6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	54%	41%	5%
H8210 Calcareous rocky slopes with chasmophytic vegetation	43%	10%	47%
<b>Mountain heaths and willow scrub</b>			
H6150 Siliceous alpine and boreal grassland	60%	3%	37%
H4060 Alpine and boreal heaths	37%	16%	47%
H4080 Sub-Arctic <i>Salix</i> scrub	14%	29%	57%
<b>Blanket bog &amp; Upland flushes, fens and swamps</b>			
H7140 Transition mires and quaking bogs	58%	10%	32%
H7150 Depressions on peat substrates of the <i>Rhynchosporion</i>	43%	26%	31%
H7130 Blanket Bogs	38%	19%	43%
H7240 Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	31%	5%	64%
H7220 Petrifying springs with tufa formation	5%	24%	71%
H7230 Alkaline fens	5%	31%	64%

	Favourable	Unfavourable recovering	Unfavourable not recovering
<b>Calaminarian grassland</b>			
H6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i>	53%	31%	16%
<b>Upland calcareous grasslands</b>			
H6170 Alpine and subalpine calcareous grasslands	24%	-	76%
H6230 Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)	3%	1%	96%
H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates ( <i>Festuco-Brometalia</i> ) [most of this habitat occurs in the lowlands]	[1%]	[96%]	[3%]
<b>Upland heathlands</b>			
H4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	21%	28%	51%
H4030 European dry heaths	6%	28%	66%
<b>Limestone Pavements</b>			
H8240 Limestone Pavements	3%	52%	45%

[all tables created Jan 2011]

## 6. Protective Measures for UK Upland Habitats

### 6.1 Conventions and legislation

A number of [International Conventions](#), [European Directives](#) and pieces of [National Legislation](#) apply to UK upland habitats. Amongst the most important are:

- [The Convention on Biological Diversity](#)
- [The Convention on the Conservation of European Wildlife and Natural Habitats](#)
- [The EU Habitats Directive](#)
- [The EU Birds Directive](#)
- [The EU Water Framework Directive](#)
- [The Wildlife and Countryside Act](#) (plus amendments & supplements)

These have been instrumental in the design of the following biodiversity strategies, priority habitat lists, and site-based designations.

### 6.2 Biodiversity Strategies

The UK Post-2010 Biodiversity Framework sets out priorities for biodiversity conservation activities at a UK-level. Additional priorities are set out in the Country Biodiversity Strategies for England, Northern Ireland, Scotland and Wales. The main objectives of these strategies are to:

- halt and reverse previous biodiversity loss through targeted actions
- increase awareness, understanding, enjoyment and engagement with biodiversity conservation
- restore and enhance biodiversity through better planning, design and practice
- ensure biodiversity is taken into account in wider decision-making
- ensure knowledge on biodiversity is available to policy makers and practitioners

These high-level strategies largely succeeded the [UK Biodiversity Action Plan](#) (UK BAP), which operated from 1992-2012.

### 6.3 Priority habitats

Statutory lists of habitats of priority or principal importance for biodiversity conservation exist for [England](#), [Scotland](#), [Wales](#) and [Northern Ireland](#). These are largely based on the [UK BAP priority habitats list](#). This includes seven upland priority habitats:

- Blanket bog
- Inland rock, outcrop and scree habitats
- Limestone pavements
- Mountain heaths and willow scrub
- Upland calcareous grassland
- Upland flushes, fens and swamps
- Upland heathland

### 6.4 Site-based designations

**Special Areas of Conservation:** Special Areas of Conservation (SACs) are strictly protected sites designated under the EU Habitats Directive. They contribute to the [Natura 2000 Network](#), which consists of a series of high-quality nature reserves spread across the European Union. A total of about 603 SACs, covering an area of around 718,400 ha, have been designated to represent the 21 UK upland habitat types listed under Annex I of the EU Habitats Directive. Information on individual UK SACs can be found in the [UK SAC information](#) spreadsheet. These were selected according to various [SAC selection criteria and principles](#).

**Sites/Areas of Special Scientific Interest:** SSSI/ASSIs are the fundamental statutory mechanism for protecting sites of ecological and geological interest in the UK. Sites of Special Scientific Interest (SSSIs) apply in England, Scotland and Wales, whilst Areas of Special Scientific Interest (ASSIs) apply in Northern Ireland. Legal responsibility for notifying and protecting such sites lies with the relevant statutory nature conservation agency in each country. The SSSI/ASSI series is intended to form a representative network covering the full range of wild flora and fauna, and especially those types and individual sites that are of greatest value to nature conservation. Detailed [Guidelines for the selection of biological SSSIs](#) for upland habitats are covered under the chapters for Bogs, Fens, and Limestone Pavements.

The tables below show the extent of upland habitats in SSSIs in England and Wales only. Comparable data were not available for Northern Ireland or Scotland.

**Table 6.1.** SSSIs in England

	Area of habitat within SSSIs (ha)	Total area of habitat (ha)	% of habitat within SSSIs
Limestone pavement	2,481	2,928	85%
Mountain heath and willow scrub	5,151	6,216	83%
Upland heathland	159,959	236,924	68%
Upland calcareous grassland	6,958	10,353	67%
Blanket bog	187,240	280,289	67%
Upland fens flushes and swamps	6,510	10,716	61%

(created from data in [Biodiversity 2020 England Indicators December 2014 Report](#); no data for data for Inland rock outcrop and scree habitats)

**Table 6.2. SSSIs in Wales**

	<b>Area of habitat within SSSIs (ha)</b>	<b>Total area of habitat (ha)</b>	<b>% of habitat within SSSIs</b>
Mountain heaths and willow scrub	120	120	100%
Limestone pavement	42	43	98%
Blanket bog	32,926	56,200	59%
Upland heathland	35,900	79,000	45%
Upland calcareous grassland	280	650	43%
Upland flushes, fens and swamps	4,333	unknown	unknown
Inland rock outcrop and scree habitat	unknown	8300	unknown

[created from: (i) SSSI area data from CCW Features Database April 2010; and (ii) total habitat area data from Blackstock, T.H. et al. (2010) Habitats of Wales: A Comprehensive Field Survey 1979-1997 (University of Wales Press); (iii) expert estimation]

## 7 Management of UK Upland Habitats

Given the threats to upland habitats, it is often necessary to undertake some form of management to improve or maintain their condition. There are a number of sources of information to guide such action, examples of which are outlined below.

### 7.1 The Upland Management Handbook

[The upland management handbook](#) covers a wide range of issues and provides a comprehensive guide to the management of upland habitats in England and other parts of the UK.

### 7.2 Best Practice for Heather and Grass Burning

Where upland habitats are managed by burning, it is important to observe the national codes and best practice guidance:

- [Scottish Muirburn code](#) and [Best practice guide to prescribed burning on moorland](#)
- [English heather and grass burning code](#)
- [Welsh heather and grass burning regulations and best practice guidance](#)

### 7.3 Scotland's Moorland Forum: Principles of Moorland Management

Produced by [Scotland's Moorland Forum](#) the [Principles of Moorland Management](#) is aimed at encouraging the highest possible standards of management of the moorland areas of Scotland. Improved management is capable of providing enduring benefits for the landscape, for biodiversity, for the rural economy and for local communities.

### 7.4 JNCC Habitat Management Search Engine

JNCC has developed a customised search engine, [Habitat Management on the Web](#), which is designed to direct users to information about how to manage UK terrestrial and freshwater habitats for biodiversity conservation

## 7.5 Annex I Management Models

The European Commission has published [Management Models for Annex I Habitats](#), including some upland examples. Each document includes information on the distribution, ecological requirements of the habitat, main trends and threats. Relevant management actions and prescriptions are described in detail. Main constraints, risks and modifiers of the proposed management have been also included. Finally, relevant parameters for cost estimates, cost estimate examples and potential sources of EU financing are illustrated.

## 7.6 Managing Upland Habitats for Invertebrates

The [Buglife website](#) provides summaries of habitat management advice for [Blanket bog](#), [Limestone pavements](#), [Upland calcareous grassland](#) and [Upland heathland](#) UK BAP priority habitats, which contain essential information to enable the practical conservation of invertebrate species associated with each habitat.

# 8 Resources for UK Upland Habitats

This page lists additional sources of information on upland issues, partnerships and initiatives.

## 8.1 Statutory Agencies

- [Natural England](#)
- [Natural Resources Wales](#)
- [Northern Ireland Environment Agency](#)
- [Scottish Natural Heritage](#)

## 8.2 Datasets

- [National Biodiversity Network Gateway](#)
- [Atlas of the British and Irish flora](#)
- [Nature on the Map](#)
- [Natural England GIS Digital Boundary Datasets](#)
- [Countryside Survey](#)
- [Upland NVC distribution maps](#)

## 8.3 Partnerships & projects

- [Cambrian Mountains Initiative](#)
- [Compendium of UK Peat Restoration and Management Projects](#)
- [Dartmoor Mires Project](#)
- [Exmoor Mires Project](#)
- [Exmoor Moorland Landscape Partnership](#)
- [Heather and Hillforts project](#)
- [IUCN UK Peatland Programme](#)
- [Langholm Moor Demonstration Project](#)
- [LIFE Active Blanket Bog in Wales project](#)
- [Moors for the Future Partnership](#)
- [MoorLIFE Project](#)
- [Peat Project](#)
- [North Pennines Peatland Programme \(formerly 'Peatscapes'\)](#)



- [Pumlumon Project](#)
- [SCaMP - Sustainable Catchment Management Programme](#)
- [Scotland's Moorland Forum](#)
- [Southern Uplands Partnership](#)
- [Sustainable Uplands](#)
- [Tees Water Colour Project](#)
- [Uplands for Juniper Project](#)
- [Yorkshire Peat Partnership](#)