

BLANKET BOG (UK BAP PRIORITY HABITAT)



Summary

Blanket bog is a community of deep peat (> 50cm deep) where the main source of water and nutrients is rain and snow. The peat is acid and varies from saturated with water to drier and fibrous.

The vegetation is made up of mixtures of hare's-tail cottongrass *Eriophorum vaginatum*, common cottongrass *E. angustifolium* and ling *Calluna vulgaris*, with purple moor-grass *Molinia caerulea*, deergrass *Trichophorum cespitosum*, bog myrtle *Myrica gale* and cross-leaved heath *Erica tetralix* on wetter peats and bilberry *Vaccinium myrtillus*, cowberry *V. vitis-idaea*, crowberry *Empetrum nigrum* and cloudberry *Rubus chamaemorus* on the drier ones. *Sphagnum* mosses predominate in the bryophyte layer, with *S. papillosum* characteristic of the wetter peats and *S. capillifolium* on the drier ones.

Blanket bogs occur on level flows, gentle slopes and even moderate ones in straths and glens, on hillside benches and on summit ridges and plateaux throughout the country. The wetter bogs are more common in the west, and in the Flow Country of Caithness and Sutherland; the drier bogs are more widespread in the east where the climate is cooler and drier.

These communities are home to a few uncommon and scarce plants such as lesser twayblade *Listera cordata*, bog rosemary *Andromeda polifolia*, dwarf birch *Betula nana* and the bryophytes *Dicranum elongatum*, *Sphagnum pulchrum*, *S. affine*, *S. austinii*, *Campylopus setifolius*, *C. atrovirens* var. *falcatus*, *C. shawii*, *Calypogeia sphagnicola*, *Cephalozia macrostachya*, *C. loitlesburgii*, *C. lunulifolia*, *Kurzia pauciflora* and *Mylia anomala*. They are also internationally important for their populations of breeding birds, particularly waders such as greenshank *Tringa nebularia*, dunlin *Calidris alpina*, golden plover *Pluvialis apricaria*, whimbrel *Numenius phaeopus* and curlew *Numenius arquata*.

Blanket bogs are damaged by burning and draining. Draining damages the hydrology of bog systems; both lead to drying out of the surface, loss of the characteristic *Sphagnum* mosses and peat erosion. Though common, burning is not necessary to maintain blanket bogs. Light grazing is not damaging and is probably better than no grazing at all: in ungrazed bogs the unchecked growth of the dwarf shrubs can lead to a decline in species diversity and, because of increased transpiration, drying out of the peat surface.

What is it?

The vegetation of the bog communities consists of mixtures of *Calluna vulgaris*, *Eriophorum vaginatum*, *E. angustifolium* and *Sphagnum* species. M17 *Trichophorum-Eriophorum* bog and M18 *Erica-Sphagnum* bog are communities of wetter peat and have species such as *Molinia caerulea*, *Trichophorum cespitosum*, *Myrica gale* and *Erica tetralix*; the most characteristic Sphagna are *S. papillosum* and *S. capillifolium*, and, in M18, *S. magellanicum*. M19 *Calluna-Eriophorum* bog occurs on drier substrates and has more *Vaccinium myrtillus*, *V. vitis-idaea*, *Empetrum nigrum* and *Sphagnum capillifolium*. Species such as round-leaved sundew *Drosera rotundifolia*, heath spotted orchid *Dactylorhiza maculata*, bog asphodel *Narthecium ossifragum* and tormentil *Potentilla erecta* are common in the wetter M17 and M18 bogs. M19 has a darker, tussocky sward and is the more common type of bog at moderate to high altitudes. Species commonly occurring in this community include *Rubus chamaemorus* and common cow-wheat *Melampyrum pratense*. M20 is a degraded form of M19 where the heather and most of the Sphagna have been eliminated by heavy grazing, repeated burning and/or atmospheric pollution.

M1 *Sphagnum denticulatum*, M2 *Sphagnum fallax/S. cuspidatum* and M3 *Eriophorum angustifolium* bog pools occupy waterlogged depressions, shallow pools and erosion channels on bogs.

M15 *Trichophorum-Erica* wet heath and M25 *Molinia-Potentilla* mire are classed as blanket bog when they are on deep peat, as they are almost always a replacement for the original bog vegetation following unfavourable management such as burning on too short a rotation followed by heavy grazing. There seems to be no reason why the M16 *Erica-Sphagnum* wet heath should not be included in this priority type, as it occurs on the deep peat of degraded blanket bogs in exactly the same way that M15 does.

How do I recognise it?

Blanket bogs are open, unwooded habitats on deep peat. They typically have a canopy of dwarf shrubs such as *Calluna vulgaris* and *Erica tetralix*, though degraded stands can be dominated by *Eriophorum vaginatum* or *Molinia caerulea*. They have a deep carpet of bryophytes under the sward. Blanket bogs are globally scarce, are home to a great array of invertebrates, and provide nesting and feeding sites for an internationally important assemblage of upland birds.

Differentiation from other priority habitat types

The bog communities M17-M20 and their related bog pools M1-M3 belong in this priority type as long as they are on blanket peat and not on a raised bog. In addition, examples of M15 wet heath and M25 *Molinia-Potentilla* mire are classed in this priority type if they occur on peat more than 50 cm deep in a blanket bog environment.

Definition in relation to other habitat classifications

Classification	Habitat types belonging to this UK BAP priority habitat
NVC	M1-3, M17-20 and deep peat (>50 cm deep) examples of M15, M16 and M25: all in blanket bog situations (level to gently undulating expanses of peat in unenclosed upland areas; not raised domes of peat in lowlands). All of these communities except M25 are included in the Scottish Biodiversity List.
Phase 1	E1: occurrences of this Phase 1 type which are on deep blanket peat in unenclosed uplands.
UK BAP broad habitat	Bog (examples on blanket peat in unenclosed uplands; this broad habitat also includes Lowland raised bogs which are on raised domes of peat in lowlands).

Definition in relation to legislative classifications

Classification	Habitat types belonging to this UK BAP priority habitat
Habitats Directive Annex I	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations).
SNH SSSI habitat features	Blanket bog: upland examples of M1-3, M15-20 and M25 (where on peat >50 cm deep). Intermediate bog (blanket): lowland examples of NVC M1-3, M17-20 and (on peat >50 cm deep) M15-16 and M25 which are intermediate between Lowland raised bog (on gently raised peat surfaces) and Blanket bog (on more or less level peat).

Where is it?

Blanket bogs are habitats on deep peat which cover the landscape in an extensive blanket, hence the name. The peat covers level ground, plateaux and gentle slopes, extending onto steeper slopes in the very wet climate of the west Highlands and Hebrides. Blanket bogs occur from a few metres above sea-level to hill tops at over 900 m. They are the product of a cool, wet upland climate where precipitation exceeds evapotranspiration, leading to the waterlogged anaerobic soil conditions in which dead plant remains can accumulate as peat. The peat blanket insulates the vegetation from the underlying rock and almost all nutrients and water are received from mist, rain and snow. The pH of the peat is strongly acid and can be as low as 4. It varies in its consistency and texture from wet and slimy in the wetter bogs at low levels to dry and fibrous in the east and at higher altitudes.

Blanket bogs grade into upland heaths on steeper slopes and thinner peat. Where water reaches the surface as a spring or a flush there are transitions to bryophyte spring communities, generally with much *Sphagnum denticulatum* forming a red-gold carpet, or acid flushes with rushes *Juncus* spp., sedges *Carex* spp., *Sphagnum* mosses and common haircap moss *Polytrichum commune*. At high altitudes there may be direct transitions to montane heaths and snowbeds where the peat thins out. Linear stands of acid or even calcicolous grassland can occur along watercourses through bogs. Woodlands may occur on adjacent steep slopes or on rocky knolls. Bog vegetation can extend right to the edge of open water.

These bog types occur throughout Scotland and, indeed, throughout the British uplands, although M19, a community of cooler climates, is absent from south-west England. The total extent of this priority habitat in Scotland has been estimated as 1,025 006 hectares.

Vegetation resembling M17 has been recorded in Ireland, but not elsewhere in Europe. There is similar vegetation to M18 in Ireland and in the lowlands of Western Europe. M19 and M20 are also almost confined to Britain and Ireland, with only small patches in western and central Norway.

What is special about it?

Some species of special conservation status recorded in this priority habitat in Scotland are listed below.

Group	Common name	Latin name	UK BAP priority list	EC Habitats Directive Annex II	Scottish Bio-diversity List	Red Data List	Wildlife and Countryside Act (1981)
amphibians	common toad	<i>Bufo bufo</i>	y				y
birds	skylark	<i>Alauda arvensis</i>			y	y	
birds	common scoter	<i>Melanitta nigra</i>	y		y	y	y
birds	Greenland white-fronted goose	<i>Anser albifrons subsp. flavirostris</i>	y			y	
birds	greater scaup	<i>Aythya marila</i>	y		y	y	y
birds	black-throated diver	<i>Gavia arctica</i>	y		y		
birds	red grouse	<i>Lagopus lagopus subsp. scotica</i>	y				
birds	Eurasian curlew	<i>Numenius arquata</i>	y		y		
birds	Arctic skua	<i>Stercorarius parasiticus</i>	y		y	y	
butterflies	large heath	<i>Coenonympha tullia</i>	y				y
flowering plants	juniper	<i>Juniperus communis</i>	y		y		
fungi	marsh honey fungus	<i>Armillaria ectypa</i>	y		y		
mammals	water vole	<i>Arvicola amphibius</i>	y		y		y
mammals	otter	<i>Lutra lutra</i>	y		y	y	y
mammals	mountain hare	<i>Lepus timidus</i>	y		y	y	
mosses	carrion-moss	<i>Aplodon wormskjoldii</i>	y		y	y	
mosses	waved fork-moss	<i>Dicranum bergeri</i>	y			y	
mosses	Baltic bog-moss	<i>Sphagnum balticum</i>	y		y	y	y
moths	argent and sable	<i>Rheumaptera hastata</i>	y		y		
moths	Haworth's minor	<i>Celaena haworthii</i>	y				
reptiles	adder	<i>Vipera berus</i>	y				y
spiders	a money-spider	<i>Notioscopus sarcinatus</i>	y				
spiders	a money-spider	<i>Saaristoa firma</i>	y				
spiders	a money-spider	<i>Semljicola caliginosus</i>	y				

Our blanket bog communities are internationally important because they are so rare on a global scale. Lindsay *et al.* (1988) estimated that 13% of the blanket bog in the world occurs in Great Britain and Ireland, which together account for only 0.23% of the world's surface area.

The living skin of vegetation that covers these vast reserves of peat is home to a few uncommon species. *Andromeda polifolia* is a characteristic species of M18 mires in the northern half of England and Wales and southern Scotland. M19 mires at moderate to high altitudes are the main habitat in Britain for *Betula nana*, *Rubus chamaemorus* and *Listera cordata*; alpine bearberry *Arctostaphylos alpinus* and dwarf cornel *Cornus suecica* can also occur. Notable bryophytes of bogs include *Dicranum elongatum*, *Sphagnum pulchrum*, *S. affine*, *S. austinii*, *Campylopus setifolius*, *C. atrovirens* var. *falcatus* and *C. shawii*, *Calypogeia sphagnicola*, *Cephalozia macrostachya*, *C. loitlesburgii*, *C. lunulifolia*, *Kurzia pauciflora* and *Myliia anomala*.

Blanket bogs are an important habitat for invertebrates such as flies, beetles and spiders. These in turn feed an array of upland birds, and blanket bogs are vital breeding habitats for many species including greenshank *Tringa nebularia*, dunlin *Calidris alpina*, golden plover *Pluvialis apricaria*, whimbrel *Numenius phaeopus*, curlew *N. arquata*, meadow pipit *Anthus pratensis* and cuckoo *Cuculus canorus*. Great skua *Catharacta skua*, Arctic skua *Stercorarius parasiticus*, red-throated diver *Gavia stellata*, merlin *Falco columbarius*, hen harrier *Circus cyaneus*, short-eared owl *Asio flammeus* and greylag geese *Anser anser* also nest in blanket bog. Golden eagle *Aquila chrysaetos*, buzzard *Buteo buteo* and raven *Corvus corax* hunt over blanket bogs.

How do we manage it?

Blanket bogs are grazed by deer and sheep, and more locally by cattle and ponies. This keeps the vegetation short and open and maintains the species diversity. Too little grazing, especially at low altitudes, can result in the heather and other dwarf shrubs becoming taller and more dense. This can shade out the smaller species, and also the bigger shrubs transpire more water from the peat and bogs can become drier, less diverse and more like heathland. Too much grazing can be damaging too, eliminating the dwarf shrubs and, through the associated trampling, breaking up the bryophyte carpet and initiating peat erosion.

Many blanket bogs are burned. This is not necessary to maintain the habitat, but may have a role in some restoration activity. Light grazing alone should be enough to maintain this habitat in good condition. Fires are especially damaging to the bryophyte layer and it can take 25 years for the original floristic diversity to re-establish itself after a hot or slow-burning fire. The conversion of much blanket bog vegetation to impoverished heathland, M20 *Eriophorum* mire, rough grassland or *Molinia* mire is the result of injudicious burning, generally in combination with heavy grazing.

Drainage and any other activities that disrupt the hydrological integrity of blanket bog, is also damaging and like burning can mediate a change from bog vegetation to heath or grassland. Peat erosion is another likely consequence.

Peat cutting on a traditional, domestic scale is still carried out in parts of the Highlands and Islands. Done in the traditional manner it is probably sustainable, allowing the vegetation some time to recover and recolonise the exposed surface; peat formation occurs at a rate of approximately 1mm/year under ideal conditions. Large scale mechanical harvesting, for fuel or for horticultural use, is significantly more damaging as the vegetation is lost and the entire hydrology and structure of the peat blanket disturbed.

Much bog has been lost to afforestation since the 1950s. However, current policy is for no new forest establishment on peat more than 50cm deep (Forestry Commission (2011)).

References, links and further reading

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Common Standards Monitoring guidance: documents (pdf files) available to download from <http://www.jncc.gov.uk/page-2199>

International Union for Conservation of Nature (IUCN) UK Peatland Programme: <http://www.iucn-uk.org/Projects/PeatlandProgramme/tabid/109/Default.aspx>

National Biodiversity Network (NBN) Gateway <https://data.nbn.org.uk/>

Scottish Natural Heritage website: <http://www.nature.scot>

UKBAP information on JNCC website: <http://jncc.defra.gov.uk/default.aspx?page=5155>