

Mountains and uplands

Scotland's uplands contain our wildest places and some of our rarest plants and animals. The condition of many upland habitats is beginning to improve as action is taken to protect and manage them.

Summary

Key messages

- Mountains, moorlands, blanket bog and rough grasslands define much of Scotland's wild landscapes.
- Scotland contains 90% of the high mountain habitat in the UK.
- Heather and bog mosses characterise much of the landscape and support nature that is synonymous with wild places, such as golden eagles.
- Most of the uplands have been modified through grazing, drainage, tree-planting and deposits of atmospheric pollution, to the extent that near-natural habitats are very rare.
- Since the 1940s, many of the upland habitats and their associated wildlife have declined in extent or worsened in condition. However, there have been some improvements recently.

State and trend

State: Moderate - high agreement, low evidence

Trend: Stable/declining - high agreement, low evidence

There is an explanation of the diagram and further information on how we carried out the assessments on the [summary pages](#).

- Assessments are of the current "average condition"; some habitats and species are in a poorer condition, and others are in a better one.
- Making any overall assessment is necessarily a simplification.
- The assessment covers the wildlife of mountains and uplands, excluding forestry. This assessment covers areas such as the Cairngorms, the Ochil Hills and the Pentlands.
- We have taken account of the scale of any damage to the environment in these assessments; impacts can be locally damaging, but may have little effect on a national scale.
- We have stated how confident we are in the assessments based on the level of agreement between the specialists involved, and the quality and quantity of the supporting evidence.
- The evidence base is low, as there are relatively few monitoring sites covering the extensive upland areas.



Overview

Covering the majority of Scotland, the uplands have some of the most extensive and best examples of near-natural habitats and wildlife associated with northern and remote parts of Europe.

A third of the uplands is bog and the remainder is acidic (rough) grassland, dwarf shrub heath (heather moorland), bracken, fen, marsh and swamp, inland rock and montane habitat. There is a wealth of wildlife, including many species that can only survive in upland and mountain habitats. Some species are regarded with particular affection by the population; the golden eagle was recently voted the nation's favourite bird, and was the subject of a national petition to be Scotland's national bird.

Wild landscapes

Mountains, moorlands, peatlands and rough grasslands form the bulk of the uplands – and these are some of our wildest landscapes. A large proportion of these areas are semi-natural, and most of the flowering plants are native. In the past, forest dominated much of the land, with only the highest reaches free from trees. Today, much of the woodland has been lost to open moorland as a result of tree felling, and later grazing and burning associated with sheep farming and deer-stalking. Above the former, upper treeline the landscapes have changed little. We have some of the most natural habitats found in Britain, especially in the corries and on the summit plateaux of the Highlands.

Forces of nature and people

Scotland's uplands have been shaped by their geology, the climate and land use. The way in which sheep farming, forestry, recreation, hunting (notably red deer and red grouse shooting) and more recently, renewable energy developments have been managed has moulded the distinctive landscape we see today.

Lying at a latitude close to that of Scandinavia, Scotland has similar geology, soils, glacial history and a cool maritime climate, so our plants and animals have much in common with those of the Nordic countries. However, the richness of oceanic mosses and ferns in Scotland's uplands is exceptional, and there is a unique mix of vegetation types associated with the influences of different climates (Atlantic, Arctic, Arctic-alpine, Boreal and even some Mediterranean elements). Many of the plants in the Scottish uplands are on the extreme edge of their world range. Although most of the species are not scarce elsewhere in Europe, the mix of birds, for instance, in Scotland's peatlands, high mountain plateaux and corries is unique; some species, such as ptarmigan and dotterel, nest at higher densities than recorded anywhere else in the world.

You can read detailed descriptions of the Scottish uplands in the [UK National Ecosystem Assessment](#).

Protected areas

Site-based conservation of nationally and internationally important habitats, species and geological features is undertaken through a network of protected areas, including [Special Areas of Conservation](#) (SACs), [Special Protection Areas](#) (SPAs) and [Sites of Special Scientific Interest](#) (SSSIs). These protected areas tend to be in much better condition than the wider countryside – they have been chosen for protection because of the special wildlife they support. The features that are of conservation interest are assessed through site condition monitoring, which provides reports on the state of nature every six years. You can find more information about conserving, enjoying and promoting our nature in the [Scottish Biodiversity Strategy](#).

Of Scotland's uplands, 24% lies within SPAs, 16% in SACs, 22% in SSSIs, 11% in [national parks](#) and 3% in [National Nature Reserves](#). That such a large extent of the uplands lies within European designated sites, in particular, is testament to the importance of our upland nature.

State

Upland habitats fall into seven broad types. Table 1 provides an overview of the estimated areas of these habitats across Scotland and how they have changed over time.

Table 1 shows that since 1990 there has been a large increase in the extent of bog and bracken habitats, and a loss of heather moorland and fen, swamp and marshy habitats. The increase in bog reflects the efforts of land managers in the last 20 years to restore bogs that have been drained and planted with trees. By contrast, the increase in bracken has often occurred in places where the land is no longer actively managed or where livestock grazing has been heavy.

Table 1: Area of broad habitats in the uplands of Scotland.

Broad habitat type	1990	1998	2007
Bog	1,922	2,039	2,044
Dwarf shrub heath (heather moorland)	1,007	912	894
Acid (rough) grassland	n/e*	911	983
Fen, marsh and swamp	289	261	238
Bracken	107	121	131
Inland rocky habitats	53	91	84
High mountains	n/e*	38	38

Source: [Countryside Survey report for Scotland](#)

**n/e indicates not estimated. Small extents of these habitat types occur outwith the uplands.*

The following sections provide some more detail about some of the habitats. You can find a more comprehensive summary of changes in [Scotland's wildlife – an assessment of biodiversity in 2010](#).

Bog

Bogs (a type of peatland) are essentially compost heaps working in reverse. Bog mosses and other plants break down very slowly in a largely waterlogged and oxygen-starved environment, and gradually form a layer of peat. A variety of plants form peat, notably bog mosses (e.g. *Sphagnum*), but also bog cotton and deer grasses.

Bogs are one of the most extensive semi-natural habitats in Scotland, covering almost a quarter of our land area (just over [2 million hectares](#)). Although relatively common in Scotland blanket bog is a globally rare habitat. Scotland has a significant proportion ([60%](#)) of the total blanket bog in the UK.

There is blanket bog throughout the Scottish uplands, but it is most extensive in areas with gentle slopes and poor drainage, dominating the landscape of the gently undulating moorlands, particularly in the North Highlands and Western and northern Isles. Bog plants are adapted to living in soil with low levels of nutrients; for example, the carnivorous sundew supplements its nutrition by trapping insects and digesting them.

Moorland

Heather moorland is probably the most visually distinctive habitat in upland Scotland – especially when its dominant plant is ling (or heather), which flowers beautifully in late summer to give the purple vistas we see on so many postcards. This habitat has a great richness of invertebrates and birds.

Since the 1940s around a quarter of heather cover has been lost, mainly due to heavy grazing by animals. Virtually the entire moorland habitat is grazed by sheep and red deer, and much of it is managed using controlled burning, known as muirburn, to regenerate the heather. This benefits livestock and wildlife by providing nutritious young shoots while retaining areas of older, taller heather for grouse and other birds to nest in. Poorly managed muirburn can result in wildfires that damage wildlife and habitats, especially young native woodland, over hundreds of hectares.

Virtually all of our moorland was once woodland, but land management and climate change over thousands of years has left us with treeless open moors. In the few areas where we still have large areas of natural woodland, especially the Caledonian pine forest, heather is a major part of the shrub layer growing under the tree canopy.

Rough grassland

Rough grassland, which has not been modified by fertilising and re-seeding, usually occurs higher up and beyond the limits of enclosed agricultural land. This habitat is characterised by a diversity of plant species, with many wildflowers and native grasses. These are a haven for invertebrates, such as the rare vertigo snail.

A lot of rough grassland used to be covered by heather, but because of heavy grazing the grasses have overwhelmed and replaced the heather and other dwarf shrubs. The area of rough grassland increased by 8% between 1998 and 2007, possibly because of the need for grazing for sheep.

High mountains

Scotland contains 90% of the high mountain habitat in the UK. The woolly fringe-moss heaths that drape mountain summits are found in few other parts of the world, and the heath on Ben Wyvis forms the largest single expanse of this habitat in the world.

The wildlife of Scotland's mountains includes birds such as ptarmigan, dotterel and snow bunting. These extreme habitats often support species that usually live further north.

Mountain heath and willow scrub are two of the most natural habitats that we have in Scotland – they occur above the tree line, usually above 600 metres, but lower in more exposed locations. Heath dominated by heather and blaeberry supports a diverse population of plants and mosses. Where willows grow, they are stunted. These habitats form mosaics with montane grasslands and moss-dominated heaths.

Changes in the condition of habitats and wildlife

An [assessment of Scotland's biodiversity](#) was carried out in 2010 and includes results from monitoring protected areas. Figure 1 compares the condition of features in the uplands in 2005, 2010 and 2014.

Assessments in 2005 and 2010 found that the condition of the majority of features in upland habitats was favourable, although upland grasslands were a particular concern.

The most recent results from 2014, show that the condition of the majority of features is continuing to improve gradually as work focuses on remedial action.

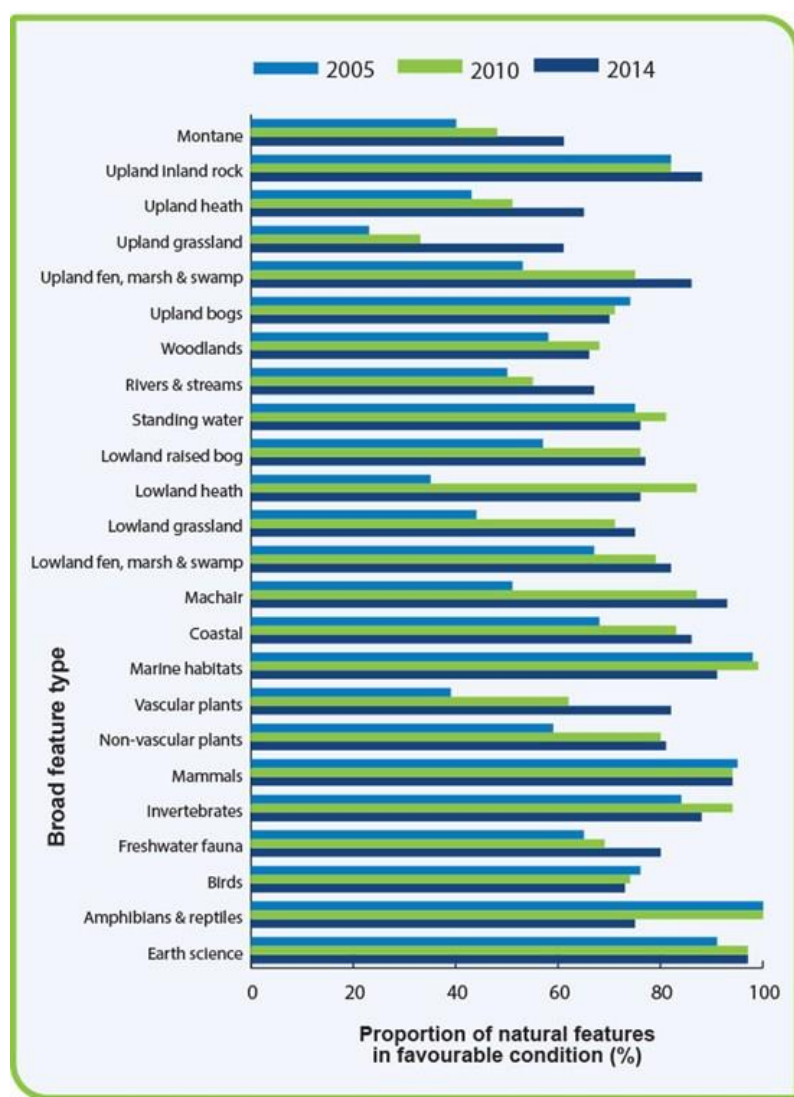


Figure 1: Results of site condition monitoring for a range of features in Scottish uplands.

Source: [Scottish Natural Heritage](http://www.scottishnaturalheritage.gov.uk/)

Pressures affecting upland wildlife

Future pressures on biodiversity across the uplands will result from a complex range of factors. The main ones are as follows.

- Land management – the grazing of sheep and deer, poorly managed muirburn, and the drainage of semi-natural areas tend to encourage the growth of grasses at the expense of dwarf shrub heath. The removal of livestock in some areas since the early part of this century has meant that the vegetation has grown more vigorously and densely, leading to a decline in the richness of invertebrates that are an important diet for some nesting birds.
- Atmospheric deposition of pollution – although acid deposition is decreasing, there is still a significant deposition of nutrients and acidic compounds across the uplands. South of the Highlands, the summit heaths have become much grassier as a result, which favours grasses and sedges at the expense of mosses.
- Woodland creation will continue in the uplands and, if tree-planting is inappropriately designed or managed, this could harm habitats and species.
- Wildlife crime, especially killing raptors such as hen harriers, golden eagles and peregrines, can have a negative impact on biodiversity.
- Climate change – the climate is already getting warmer, and spring events, such as bud burst, bird migration movements and egg laying, are happening earlier in the year. Some plants and animals are also shifting northward, although the reasons for this are not straightforward. Shifts up hillsides are also anticipated, with some possibly displacing the plants and animals adapted to alpine or arctic-alpine conditions on the high tops.

What is being done

Policy and legislation

The [2020 Challenge for Scotland's Biodiversity](#), published in 2013, sets out ambitious policy proposals for restoring nature and getting more benefits from it. At the centre of this policy is a greater recognition of the '[services](#)' that the uplands provide for us.

Policy is frequently reviewed, and this includes evidence-gathering and debate initiated by the Scottish Parliament's Rural Affairs, Climate Change and Environment Committee (RACCE). In 2013 the committee considered [deer management in the uplands](#). It is estimated that around 23% of nature conservation features in protected areas are in unfavourable condition where deer are present. Dealing with this pressure is very important for wildlife and habitats in the future.

Because agriculture is the dominant land use in the uplands, legislation associated with the European Commission Common Agricultural Policy (CAP) is very important for improving the condition of wildlife. This legislation is periodically reviewed and refreshed to reflect changing policy priorities. CAP reform has, over many decades, put more emphasis on support payments for farmers who contribute to environmental conservation, particularly in remote and fragile areas like the Scottish uplands.

Many of the uplands have been protected through designations that recognise their special wildlife value.

These protected areas are monitored under the site condition monitoring programme as part of the European Commission Habitats Directive. This involves assessing the important features of the areas every 6 to 24 years, depending on how sensitive and vulnerable the features are.

This monitoring programme applies to SSSIs, SPAs, SACs and [Ramsar](#) sites. In total, these sites have 5,372 features for which the sites were designated (44% habitats, 39% species and 17% earth science features) within 1,883 protected areas, covering approximately 17% of Scotland. Annual reports provide detail on the condition of features as 'favourable' or 'unfavourable', with subsets of each ranging from 'favourable maintained' to 'totally destroyed'.

Assessments of features are made on site, with measurements taken of ecological attributes such as the composition and abundance of plant species and the extent of erosion. Formal work on this programme began in 1994, with the first UK report produced for the period 1994–2000.

Sustainable land management and practical conservation

With financial support from public and private sources, land managers are doing a huge amount of wildlife conservation work. Most projects are undertaken by farming businesses, but there are also very active not-for-profit and public sector organisations. These are often the land managers who have the resources to undertake the most ambitious habitat restoration projects.

Large areas of peatland are being restored by blocking ditches and removing trees to improve the prospects for wildlife. The [IUCN Commission of Inquiry on Peatlands](#) has highlighted the exemplary nature of peatland restoration work being done in Scotland, and work in the Flow Country peatlands in Caithness and Sutherland has been acclaimed internationally.

Land managers in the uplands can apply for financial assistance for wildlife conservation projects. The major source of funding comes from [Scotland's Rural Development Programme](#) (SRDP).

A significant number of volunteers give their time by monitoring wildlife across Scotland with organisations like the British Trust for Ornithology, Scottish Wildlife Trust, Butterfly Conservation and Plantlife. This work contributes a huge amount of detailed knowledge about how upland biodiversity is changing and provides a lot of the information made available through Scotland's network of [biological records centres](#).

It is essential that organisations and land managers work together to improve the condition of habitats and species in the uplands. [Scotland's Moorland Forum](#) is a good example of a collaborative group that has commissioned evidence-gathering studies and produced policy and good-practice guidance for land managers.

Some major projects have been established in the uplands to develop and demonstrate good practice in wildlife conservation and management. One example is the [Langholm Moor Demonstration Project](#), which is developing new methods for restoring heather moorland and managing the conflict between grouse-moor management and raptor conservation.