

Red List of Ecosystem assessment series

Produced by JNCC and NatureScot, supported by Natural Resources Wales, Natural England, and Northern Ireland Environment Agency.

This resource is one in a series/number of Ecosystem Red List assessments developed to accompany the UK Biodiversity Indicator '[Red List of Ecosystems](#)'. The assessments are available at: <https://jncc.gov.uk/resources/7b922dfc-708b-4c8c-9e6a-e2040447fb39>.

Resilient ecosystems are crucial for preventing biodiversity loss and species extinction. Maintaining healthy ecosystems safeguards the essential services they provide, which are fundamental to human well-being and a thriving economy. However, pressures and threats such as deforestation, overfishing, or climate change, can disturb the balance of ecosystems and threaten their health and functioning. Assessing the level of threat facing ecosystems is important in helping us understand the current status of the environment, and on a practical level, assessments can be used to help prioritise conservation funding decisions and where to take conservation management action on the ground.

The 'Red List of Ecosystems' (RLE) is a global assessment approach set out by the International Union on Conservation of Nature (IUCN). The approach includes consideration of a series of criteria, including change in geographic distribution through time; whether the ecosystem distribution is geographically restricted; evidence for any environmental degradation; and disruption to biotic processes or interactions. We have not carried out the quantitative analyses of the probability of ecosystem collapse necessary to assess criterion E as we do not have the data needed to carry out such analyses consistently. The IUCN methodology is widely used as a robust approach to assessing the status of ecosystems. Further details of the criteria used in these assessments are available on the [IUCN portal](#).

This assessment series sets out the RLE assessment conclusions for ecosystems found in the UK, alongside the details of how the assessment was made, including for each IUCN component criterion. The assessments have been peer-reviewed, and source data is referenced. Once complete, the series will cover the full range of natural and seminatural habitats that occur in the UK, throughout marine, terrestrial and freshwater environments.

Assessments are conducted according to the [Global Ecosystem Typology Level 3](#) (Ecosystem Functional Groups). This enables the assessments to feed into the Kunming-Montreal [Global Biodiversity Framework](#) (GBF) headline indicator A.1 Red List of Ecosystems. This indicator, which has been incorporated into the UK Biodiversity Indicator suite, is designed to measure progress against [Goal A](#) ('Protect and restore') and [Target 1](#) ('Plan and manage all areas to reduce biodiversity loss') of the GBF.

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T3.3 Cool temperate heathlands

1. Key facts

Ecosystem description: Heathlands are an open habitat characterised by low-growing shrubs, particularly heathers and blaeberry, along with grasses and scattered trees. It is a landscape shaped by human activity, specifically through historical land management practices like grazing and burning, which prevented the growth of trees and created a unique, open environment. Heath occurs on low fertility soils which can be either wet or dry in nature. Description of the five UK heathland Habitats Directive Annex I types can be found on the JNCC website (<https://sac.jncc.gov.uk/habitat/>).

Heathland occurs throughout the UK, with extensive areas in the Scottish Highlands, Wales, south-western and northern England and Northern Ireland (Averis et al., 2004; JNCC, 2025a-d). The Cornish examples of this ecosystem, which are highly localised, host a distinctive flora not found elsewhere in the UK.



Image credit: Bullers of Buchan SSSI, Aberdeenshire ©NatureScot

Overall assessment conclusion: Endangered (EN) based on criteria C2a, D1 and D2a.

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Corresponding habitat classifications:

The following habitats were considered in the production of this assessment:

EUNIS codes: [F4.11](#) Northern wet heaths; [F4.2](#) – European dry heaths

UK BAP Priority Habitats: Lowland heathland and Upland heathland

Habitats Directive Annex I habitats: [H4010](#) Northern Atlantic wet heaths with *Erica tetralix*, [H4020](#) Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*, [H4030](#) European dry heaths, [H4040](#) Dry Atlantic coastal heaths with *Erica vagans*, [H5130](#) *Juniperus communis* formations on heaths or calcareous grasslands

2. Assessment against IUCN criteria

Criterion A: Reduction in geographic distribution

Criterion A considers reduction in geographic distribution over ANY of the defined time periods for criteria A1, A2a, A2b or A3. For details of time periods and criteria see [IUCN Red List of Ecosystems Criteria Summary Sheet 2.2 EN.pdf](#)

Recent trends in the area of the two main heathland types covered by this ecosystem type in the UK has been reported upon by JNCC (2019a,b):

1. For H4030 European dry heaths, the area was reported as stable for the period 2007-2018.
2. For H4010 North Atlantic wet heath with *Erica tetralix*, the area decreased by a limited amount (1% per year or less) between 2006-2018.

Figures from Countryside Survey (2000) suggested a decrease in the extent of the dwarf shrub heath broad habitat type of 59,000 ha across the UK between 1990-1998, equivalent to 0.58% per year (Haines-Young et al., 2000). However, subsequent analysis (Barr et al., 2003) suggested that almost all the change recorded came from relatively small changes in overall vegetation character moving monitored vegetation out of the broad habitat and hence could be considered part of the normal fluctuations expected within the upland component of the habitat.

This contrasts with historical declines of heathland, which have been substantial particularly in the lowlands. In England, lowland heathland has also declined greatly as shown by figures collated by Farrell (1993): the extent of heathland in Hampshire went from 46,540 ha in 1792 to 16,865 ha in 1982 (64% loss); heathland on the Suffolk Sandlings went from 6,470 ha in 1783 to 1,580 in 1983 (76% loss); Breckland Heaths went from 28,932 ha in 1900 to 4,529 ha in 1980 (84% loss); heathland in Surrey went from 22,780 ha in 1762 to 3,060 ha in 1985 (87% loss); and heathland in Dorset went from 39,960 ha in 1759 to 5,141 in 1987 (87% loss). In Wales, Blackstock et al. (1995) reported a 51% decline of dry heath and 95% decline in wet heath on the Llyn Peninsular between 1920-22 and 1987-88. Although this represents only a small area of Wales, it is likely that a similar pattern of loss occurred throughout Welsh heaths.

Upland heathland has also reported to have declined, though losses have been more modest with an estimated 18% loss in Scotland between the 1940s and 1970s and a further 5% decline in the 1980s, and a 27% loss in England and Wales between 1947 and 1990 with higher local losses reported in the Berwyn range (44%), Cumbria (36% between 1940-1980), and the Peak District (36% between 1914-1979) (see Thompson et al. 1995; Mackay et al. 1999). For upland heath losses are just below the 30% threshold for vulnerable for the 50-year period for geographic distribution.

Assessment: Vulnerable (VU) A3 while noting the large historic reductions in geographic distribution of lowland heath, the overall reduction in extent of this ecosystem is between 30% and 50%.

Criterion B: Restricted geographic distribution

Criterion B considers restricted geographic distribution indicated by ANY of the time periods for criteria B1, B2 or B3. For details of time periods and criteria see [IUCN Red List of Ecosystems Criteria Summary Sheet 2.2 EN.pdf](#).

Despite historic losses, heathland remains a widespread habitat in the UK, at least in the uplands, with a range surface area exceeding of 176,000 km² (JNCC, 2019a-d). The estimated extent of this ecosystem type is 125,49 km² (Mountford et al., 2025).

Assessment: Least Concern (LC) due to area of the range of the habitat being >>50,000 km².

Criterion C: Environmental degradation

Criterion C considers environmental degradation over ANY of the time periods for criteria C1, C2a, C2b or C3. For details of time periods and criteria see [IUCN Red List of Ecosystems Criteria Summary Sheet 2.2 EN.pdf](#).

Atmospheric pollution (most probably SO₂ and its solution products) has severely affected upland vegetation across the southern Pennines, notably destroying the cover of *Sphagnum* and *Racomitrium* on blanket bogs in the 19th and 20th centuries. Although concentrations of SO₂ have decreased, nitrogen deposition has increased approximately fourfold during the past century (Lee et al. 1988). Nitrogen deposition effects on heath in the UK include changes in species composition with a marked decline in heather and *Vaccinium* species, an increased dominance of grasses; loss of mosses, liverworts and lichens (UK Air Pollution Information System, 2025). It is also linked to increased risk of heather beetle attacks negative effects on ericoid mycorrhiza and increase in drought sensitivity. Due to continued nutrient nitrogen critical load exceedance, it is expected that 5-25% of the area of wet heath and more than 25% of the area of dry heath will be in unfavourable condition in c.2030, unless measures are taken to reduce nitrogen deposition impacts.

Wet heath is sensitive to changes in hydrology. During the mid-twentieth century, open ditches were cut across much of the UK peatland landscape, which has resulted in widespread degradation by altering runoff regimes, increasing oxidation of organic matter, changing carbon, nitrogen and phosphorous cycling, and increasing metal and suspended sediment concentrations in streams relative to intact peatlands (Ramchunder et al., 2009).

Many UK upland peatlands have been subject to burning for land management purposes, particularly grouse moor management, with the practice increasing over the 20th and early 21st century. This has impacted upland peatland habitats in various ways (Noble et al., 2025), including generally moving the vegetation of upland wet heath away from its characteristic composition. Burning also removes a large proportion of aboveground carbon stock via combustion, followed by gradual re-accumulation over several decades. The export of dissolved and particulate organic carbon increases after burning; and this in turn influences water chemistry and flow. Poorly managed 'hot' burns are of particular concern, as these can have severe damaging consequences for peatland ecology, hydrology and soil processes. However, well-managed burns are used for the conservation management of some types of heathland, such as bearberry heath, and to prevent heathland transitioning to woodland.

Lowland and upland heathland have been assessed as having medium sensitivity to climate change impacts, due to factors such as drying of sites as a result of summer drought (particularly on wet heathland), increased risk of wildfires, wetter winters leading to increased surface runoff and nitrogen deposition (Natural England and RSPB 2020).

Assessment: Endangered (EN) C2a due to past, current and predicted impacts of air pollution, drainage, burning and climate change.

Criterion D. Disruption of biotic processes or interactions

Criterion D considers Disruption of biotic processes or interactions over ANY of the time periods for criteria D1, D2a, D2b or D3. For details of time periods and criteria see [IUCN Red List of Ecosystems Criteria Summary Sheet 2.2 EN.pdf](#)

Heathland below approximately 600m altitude is a habitat maintained by light grazing and muirburn. If these pressures are removed, it may transition to woodland. If grazing is too intense then heather cover will be reduced, and it will transition to grassland (Backshall et al. 2001). Inappropriate burning can negatively impact the vegetation and faunal interest, particularly on wet heath (Noble et al., 2025). For wet heathland the greatest threats to condition identified in the most recent assessment were intensive grazing by livestock or deer, and inappropriate burning (JNCC 2019a). Conversion to forestry, renewables developments, spread of problematic native species (bracken), and spread of pest and pathogens were also reported as threats. For dry heath the threats identified were the same but did not include spread of problematic native species as highly (JNCC, 2019b).

As a result of over-grazing, encroachment by trees/large shrubs and the effects of atmospheric pollution, drainage and burning (see above), most heathland vegetation in the UK is in unfavourable condition (JNCC 2019a,b).

Assessment: Endangered (EN) D1 and D2a due to factors listed above, though noting that lowland heath is particularly heavily threatened.

Conservation measures in place

The most important heathland sites are protected within SSSIs and Special Areas of Conservation (SAC), although many are in unfavourable condition. There are 72 SACs designated for heathland across the UK and several others where it occurs but was not the primary reason for site selection.

Legislation is currently in place in Scotland to ensure better deer management and muirburn. Appropriate domestic grazing is supported through, for example, the Agri-Environment and Climate Scheme (AECS; Scottish Government, 2025) and forestry through UKFS. The spread of bracken in the uplands is currently increasing due fern-specific herbicide treatment no longer being available. A UK working group is currently investigating alternative methods of control.

Overall assessment conclusion

Cool temperate heathlands in the UK are assessed as being Endangered (EN) based on criteria C2a, D1 and D2a.

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