# Biodiversity and natural features – underpinning our ecosystem services

## Why are the uplands important for biodiversity and natural features?

- Biodiversity, and natural features such as rivers and mountains, underpin other ecosystem services. They also provide many direct benefits to people in the form of recreation and aesthetic values.
- The English uplands are nationally and internationally important for a range of wildlife habitats, geology and outstanding landscapes. For example, they contain a significant proportion of the global resource of blanket bog and upland heathland. Their rare Atlantic oak woodlands could be described as Britain's temperate rainforest.
- The 74% (in total) of the uplands designated for spectacular wildlife, geology and landscapes is a measure of how important they are. Designation affords some degree of legal protection from development and adverse land use change.

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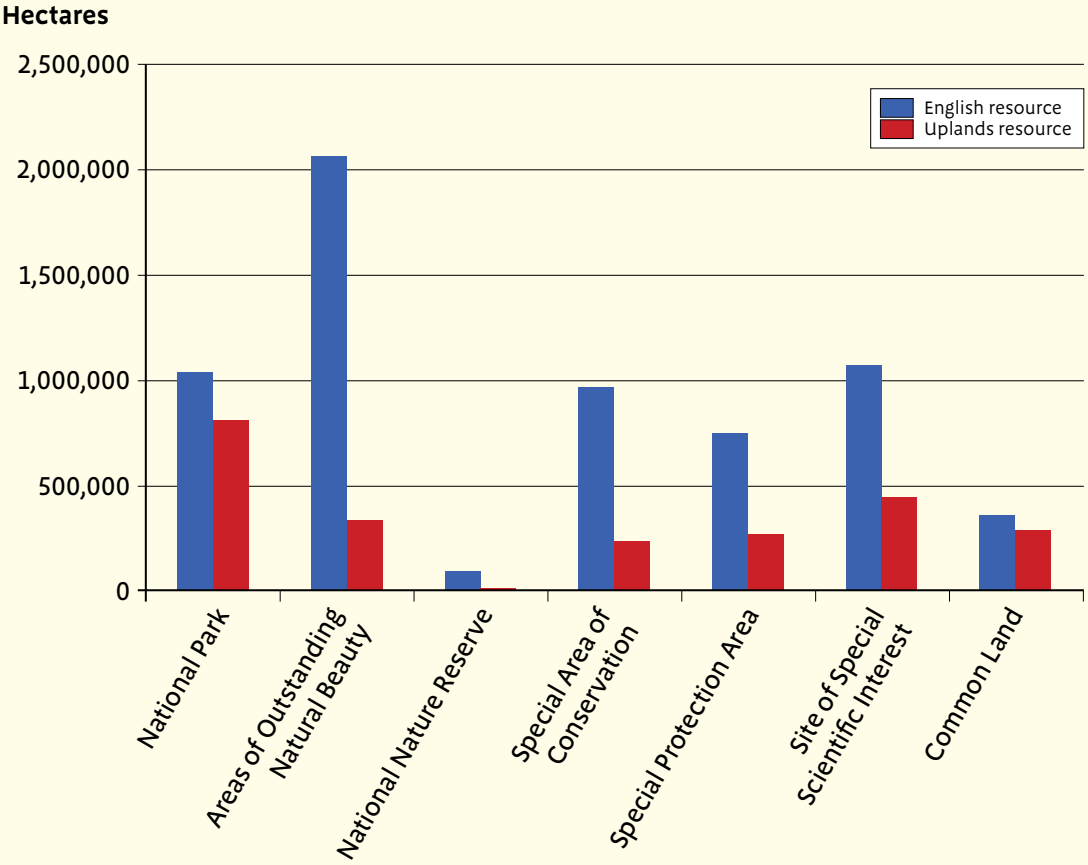
Roseroot – an Arctic-alpine species threatened by a warming climate

**Concentration of designated areas within England's uplands**

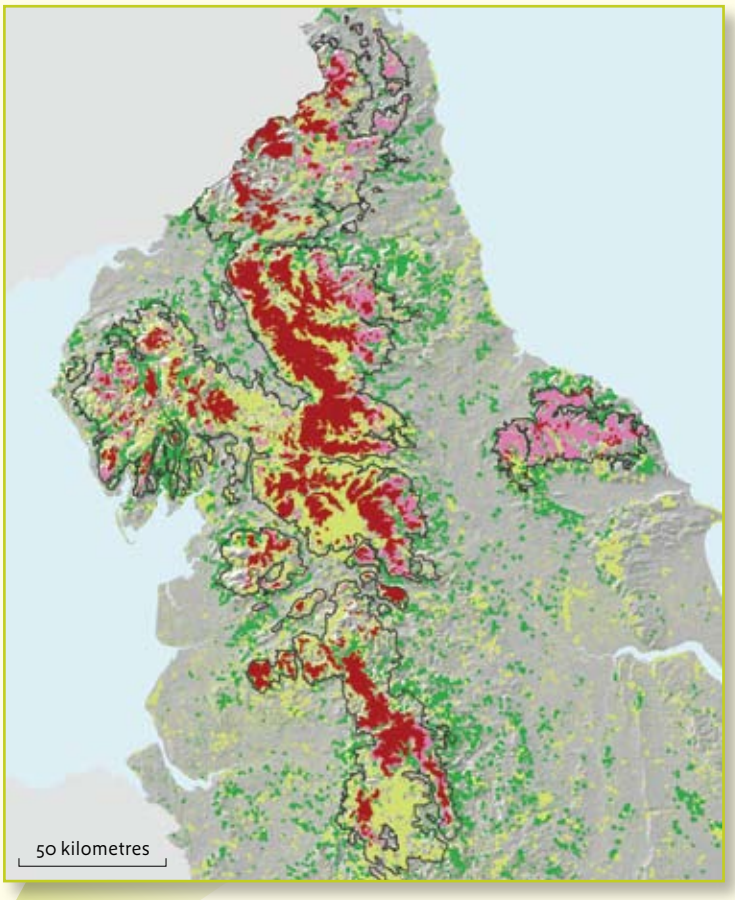



# Habitats

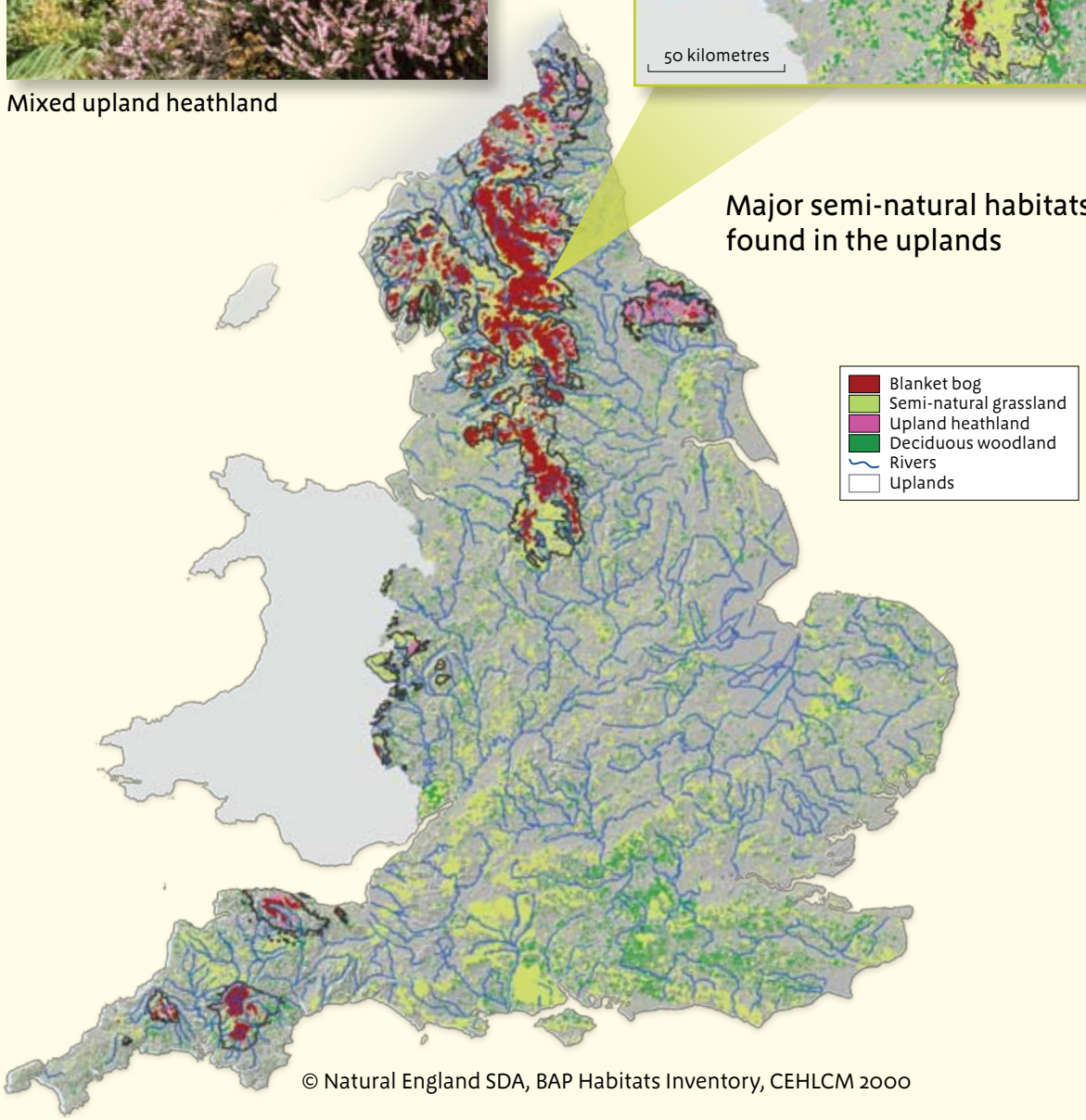
- The largest remaining tracts of 'semi-natural' habitats in England are found in the uplands. Most upland habitats have been subject to centuries of management by grazing, cutting, burning and drainage.
- This has changed these landscapes from what at one time was predominately woodland and blanket bog, to the mix of meadow, heathland, grassland and small amount of semi-natural woodland today.

© Jean Johnston

Mixed upland heathland




Major semi-natural habitats found in the uplands

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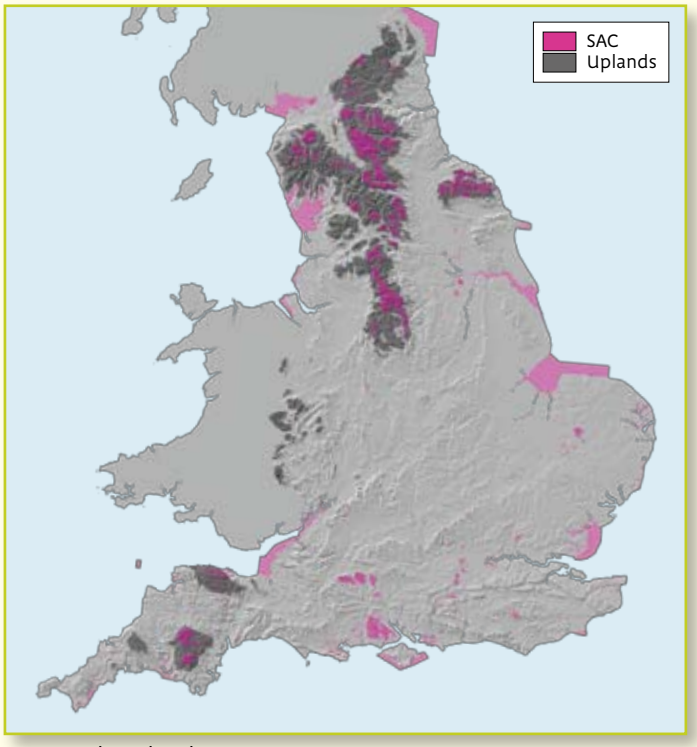
# Protection of biodiversity and natural features

## SSSIs

- 53% of England's Sites of Special Scientific Interest (by area above mean high water) lie within the uplands. These areas have been designated for their outstanding wildlife habitats, species and geology. They are legally protected under the Countryside and Rights of Way Act (2000).

Special Areas of Conservation

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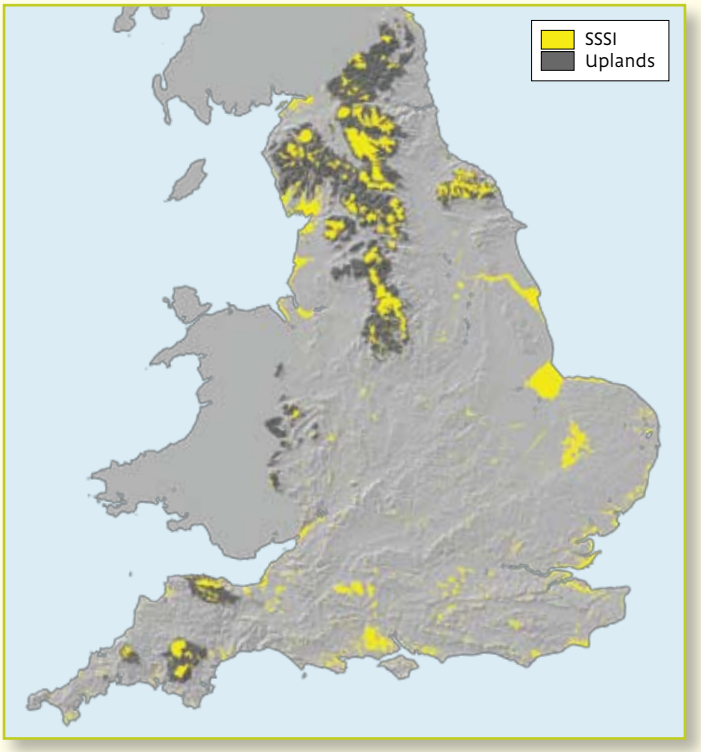
Sites of Special Scientific Interest

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## SACs

- Special Areas of Conservation are designated under the European Habitats and Species Directive. These areas are underpinned by SSSIs, but they are afforded higher levels of protection in law, and can attract public investment for land management which improves the features for which they were notified such as upland heath and blanket bog.

## SPAs

- Much of the North Pennines, Forest of Bowland, North York Moors, Nidderdale and the Peak District are designated as Special Protection Areas for Birds under the European Habitats and Species Directive.
- They have mostly been designated for their populations of breeding waders (such as snipe, curlew and golden plover) and for raptors such as the merlin and hen harrier.

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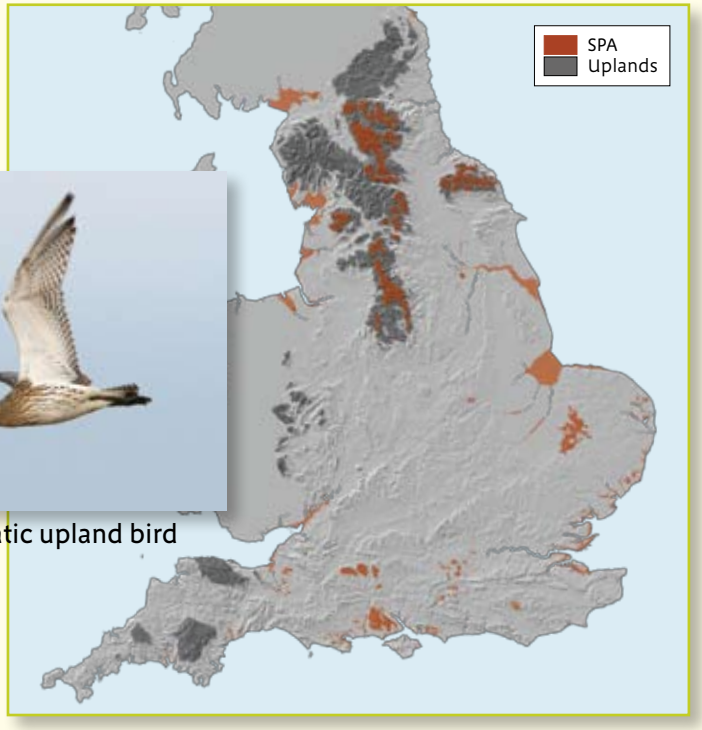
Curlew – an enigmatic upland bird

Special Protection Areas

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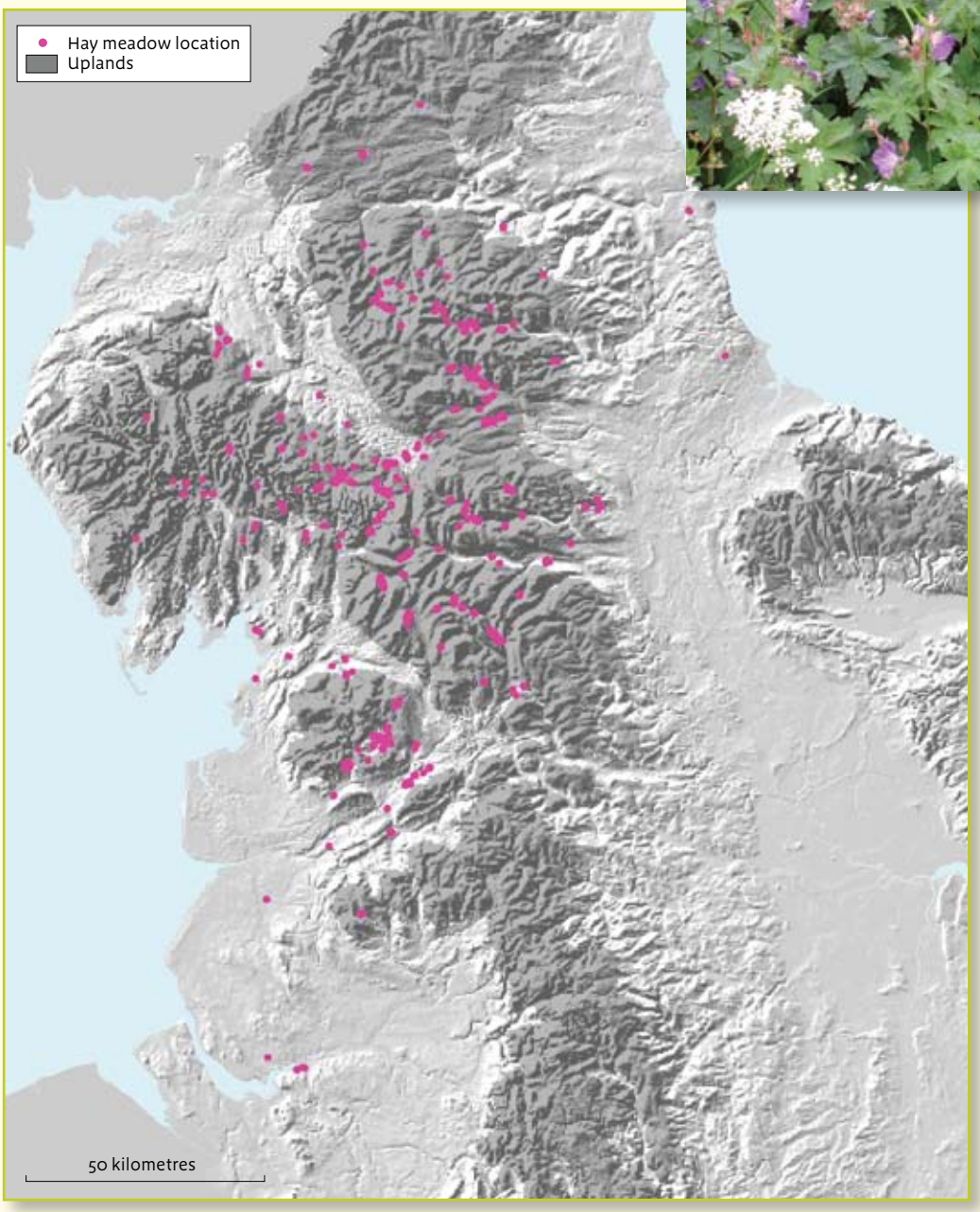
# Biodiversity challenges and solutions

- Habitat change and loss from the uplands has been a feature of the last 50 to 100 years. Some habitats have been affected more than others.
- **Upland hay meadows** with their diversity of flowering plants, are characteristic features of the Northern English uplands (with very few being found in Wales or Scotland).
- For all enclosed species-rich grassland (including upland hay meadows) there has been a 97% loss between 1930 and 1984 across the UK.
- There are only about 2,000 hectares of upland hay meadow left, of which three quarters are afforded some protection through SSSI designation.
- Hay meadows depend on the annual cycle of cutting and 'aftermath' grazing to ensure their continuity. They are still vulnerable to excessive use of fertiliser, and a switch from hay to silage making for livestock feed.
- The North Pennines Haytime Project is working to encourage appreciation and conservation of this fantastic and rare resource (http://www.northpennines.org.uk/index.cfm? articleid=11799).

© David Claves

Upland hay meadows can contain up to 120 species of flowering plant

## Upland hay meadows (as defined in the UK Biodiversity Action Plan)

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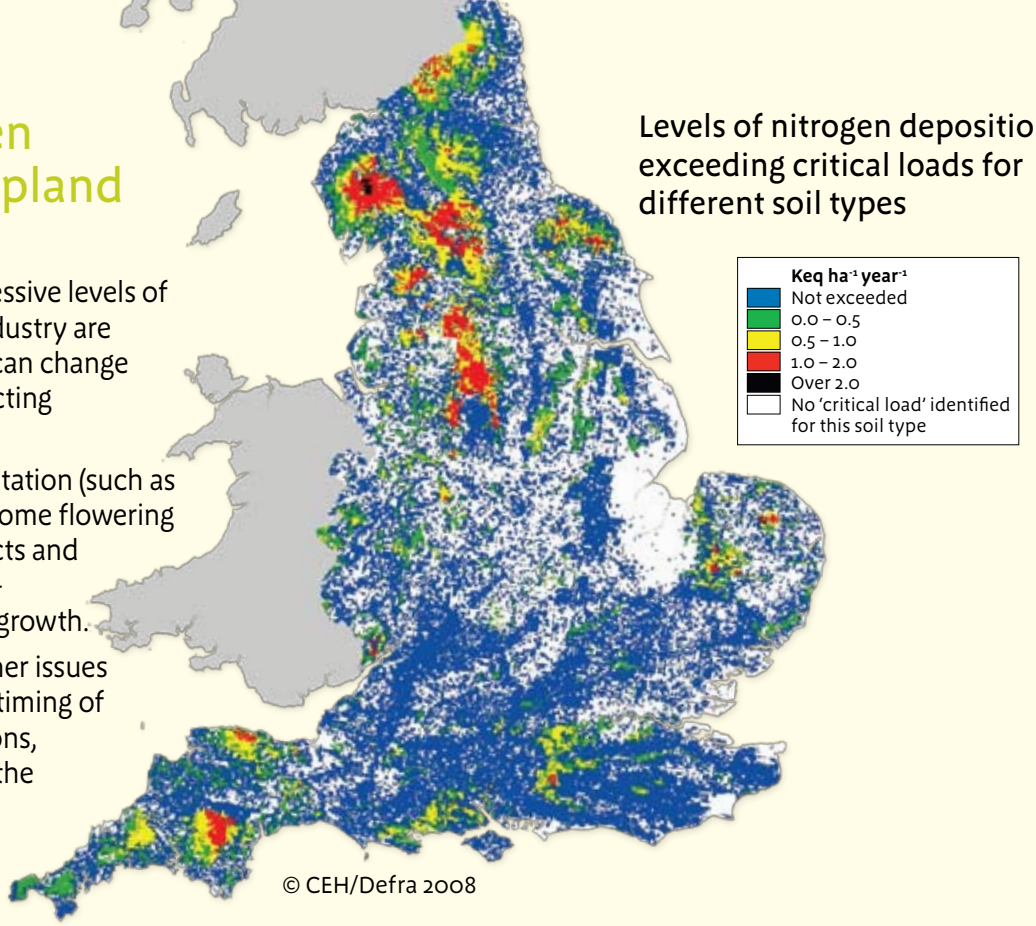
## How does nitrogen pollution affect upland habitats?

- In many upland areas, excessive levels of nitrogen pollution from industry are deposited by rainfall. This can change the properties of soils affecting vegetation growth.
- The overall amount of vegetation (such as grasses) can increase, but some flowering plants, and hence the insects and birds they support, are out-competed by excess grass growth.
- Addressing some of the other issues affecting habitats, such as timing of land management operations, would help avoid some of the compounding affects of nitrogen pollution.

Levels of nitrogen deposition exceeding critical loads for different soil types

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## A barometer of the changing farming practices

- The **twite** was once much more widespread on the 'moorland fringe'. Its numbers had fallen by over 80% since 1990, so that by 2008 there were less than 100 pairs in just 15 colonies, mainly in the Peak District.
- It feeds on seeds from sorrel, cotton grass and dandelion, which are often absent in the pastures and meadows of modern agriculture.
- Practices like rolling, harrowing and application of artificial fertilisers eliminate these 'weeds'. The twite also needs bracken or tall heather for nesting, thus less intensive burning and grazing of heather moorland would be beneficial.
- Conservation action to help the twite has started but there remains a "very real prospect of it's extinction as a breeding species in the English uplands" (RSPB).

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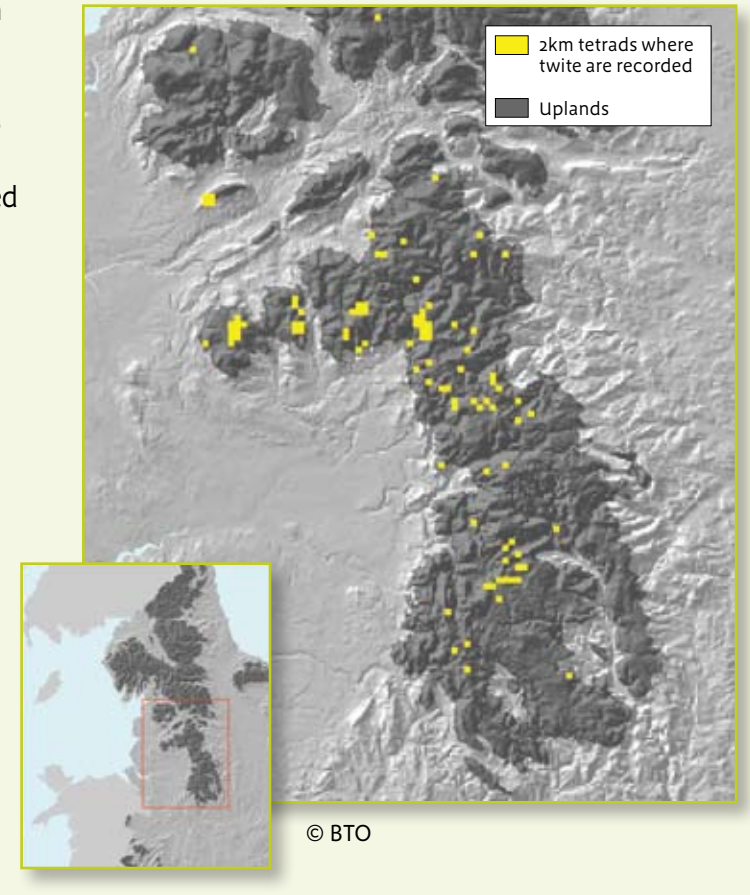
A twite fledgling – a species with a highly restricted range

Twite distribution

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# Uplands as a refuge

- The spectacular **black grouse** was once present in every county in England. It is now highly restricted to parts of the North Pennines due to:
  - its historic popularity as a game species in the lowlands;
  - a loss of the mixed habitat of woodland, scrub and grassland that it prefers;
- There are about 1,500 displaying males in the North of England, and another 5,000 in Scotland.
- Habitat improvement such as more native woodland and scrub, reduced grazing and blocking of drains on peat soils (which provides better habitat for the favoured black grouse chick food of invertebrates) should all help this bird's prospects.
- Efforts through the Black Grouse Recovery Project (http://www.blackgrouse.info/recovery/northpenn.htm) have given some reason for hope, however long term projections are that climate change may force the bird further north.

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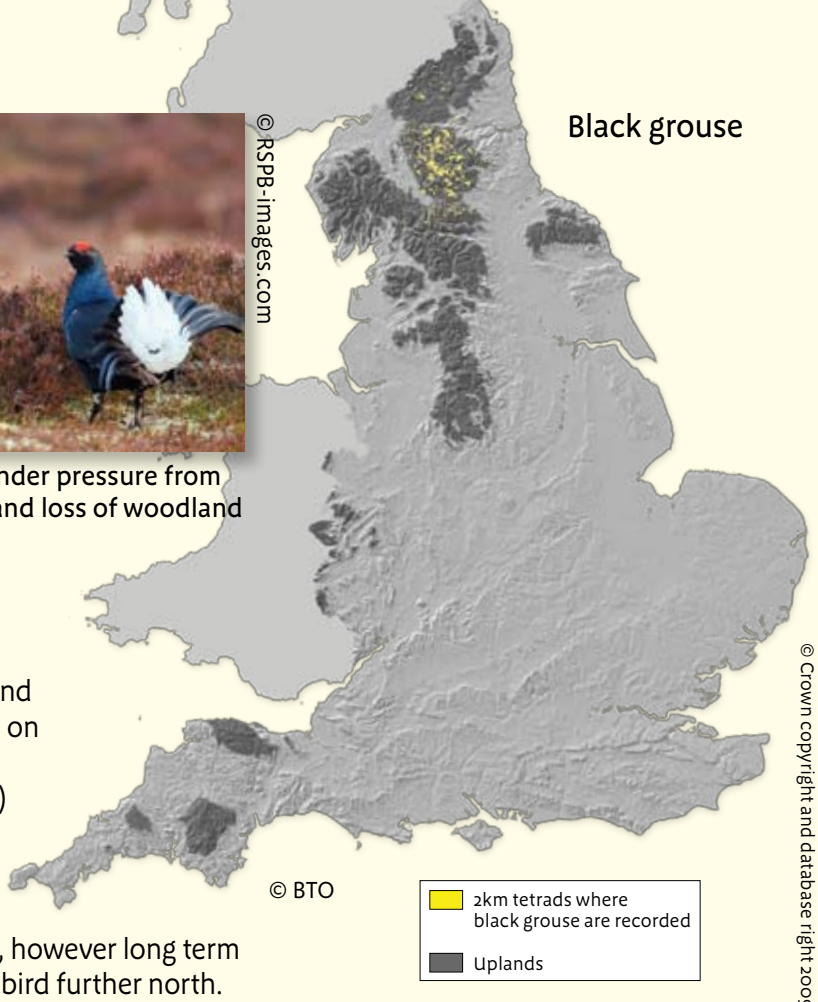
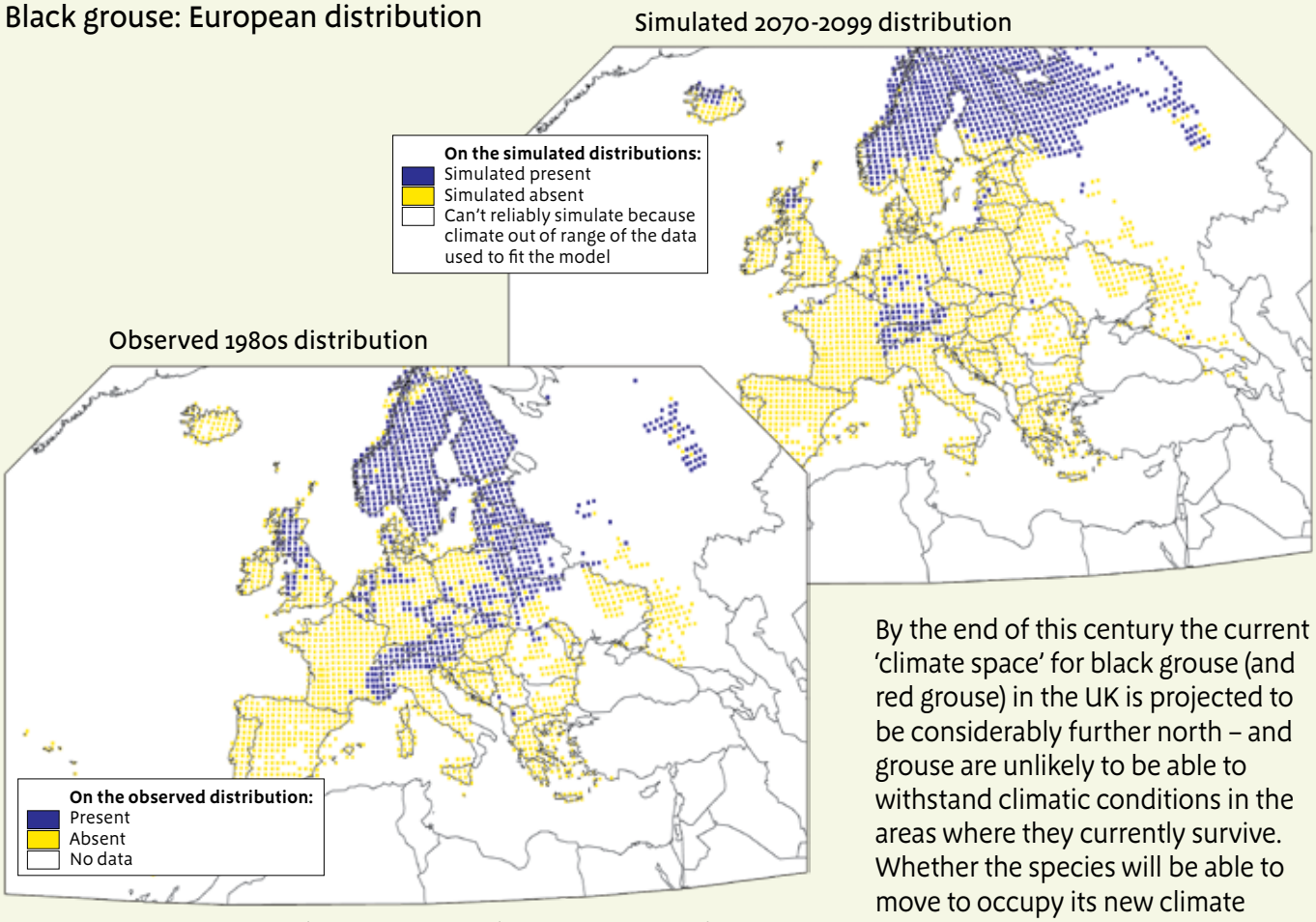
Black grouse – under pressure from climate change and loss of woodland




## Black grouse: European distribution

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By the end of this century the current 'climate space' for black grouse (and red grouse) in the UK is projected to be considerably further north – and grouse are unlikely to be able to withstand climatic conditions in the areas where they currently survive. Whether the species will be able to move to occupy its new climate space is uncertain.

# A tricky conservation problem!

- 70 years ago the **red squirrel** would have been present throughout England. Its competitor – the introduced and larger grey squirrel has chased it from lowland broadleaved areas. The advantage that the red does have however over the grey is that it can survive better in conifer woodland. Today's reds have to some extent found refuge in upland conifer woods.
- More conifer woodland would help the red squirrel, but increasing the areas of broadleaved trees would give the greys better ways of invading the last red refuges.
- Whilst our objective overall is to increase the amount of native broadleaved woodland in the uplands, it is good practice not to plant broadleaves like oak in buffer areas around the 'red squirrel reserves' that have been identified through the Save Our Squirrels project (see inset map).
  See http://www.saveoursquirrels.org/pge/home/home_page.html

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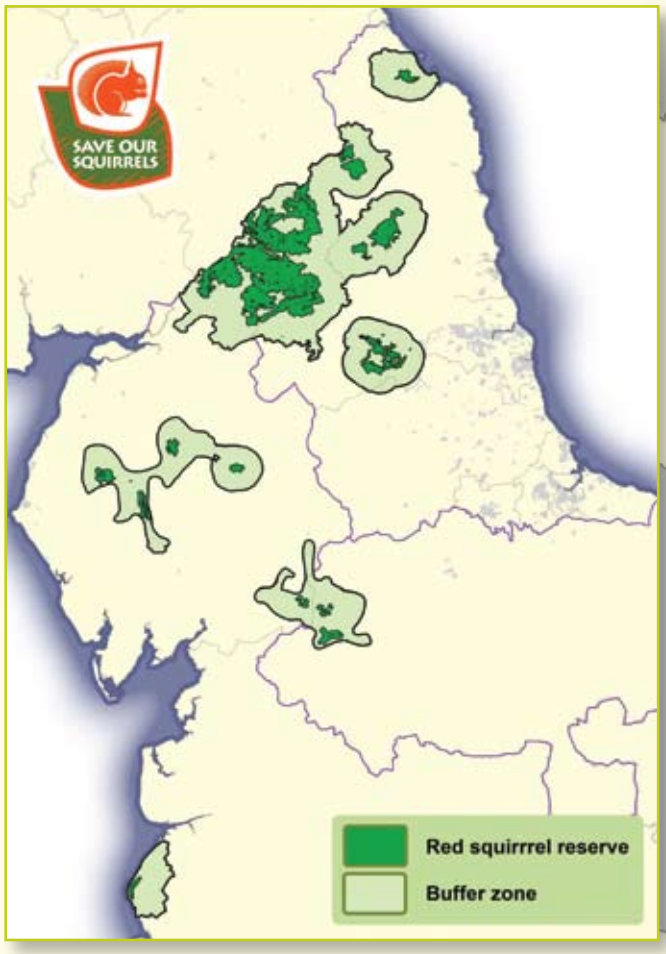
Red squirrel – losing ground in England

Red squirrel reserves and buffer zones in Northern England

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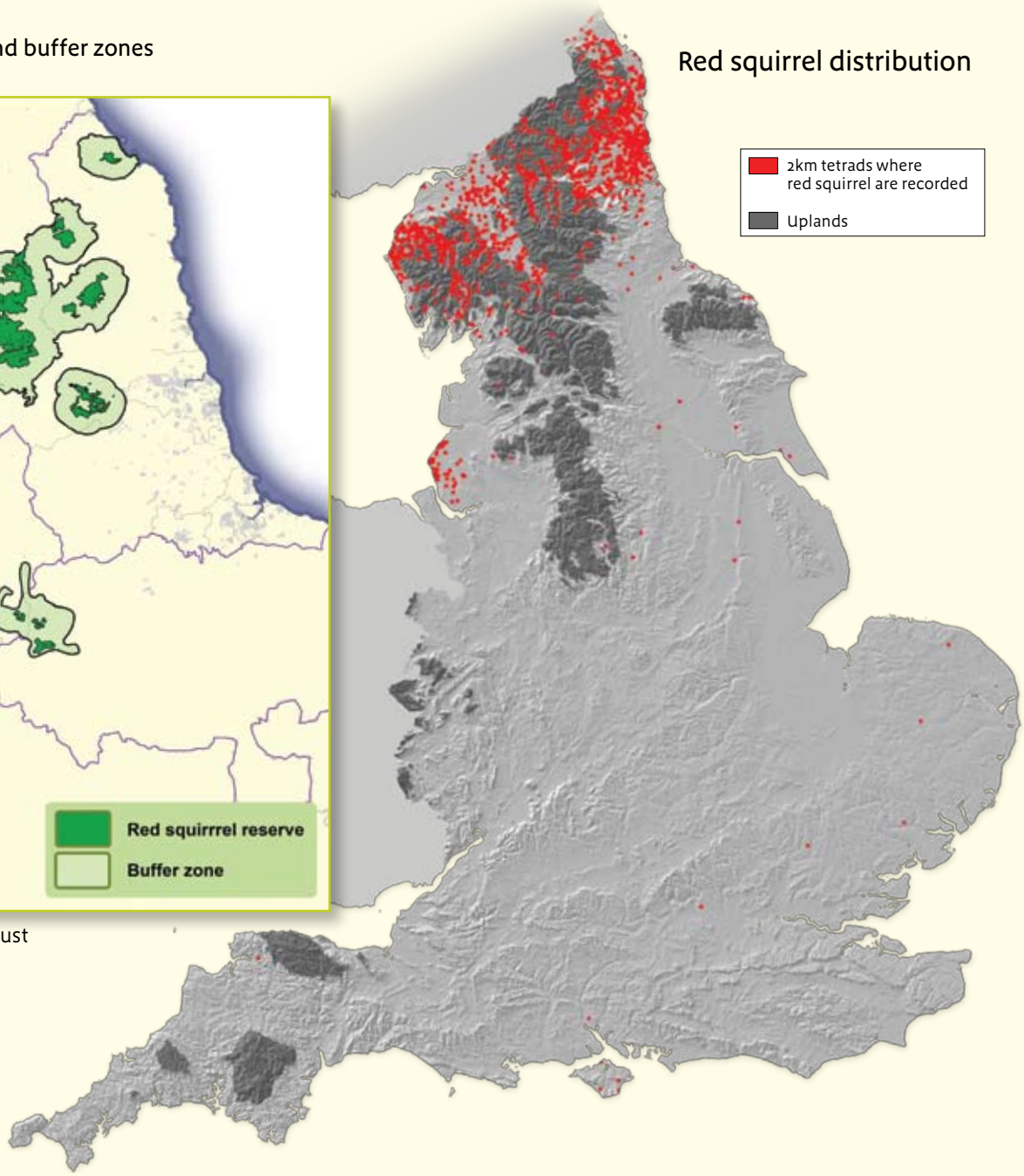
Red squirrel distribution



# Adapting to change

- The **Dartford warbler** has previously been confined to the lowland heathland of the south and south east of England.
- Lowland heaths have been one of the most pressurised habitats in England – now only representing about 20% of their former extent – because they have been built on, converted into crop land or planted with conifers. Many of the remaining areas are very fragmented.
- With the warming climate, the Dartford warbler has found it can make use of the larger expanses of heathland (albeit upland heath) on Exmoor and Dartmoor and the coastal heathland of the south west. So the bird is successfully adapting to climate change.



Dartford warbler – adapting to change

## Dartford warbler distribution