UK Biodiversity Indicators in Your Pocket 2010

UK Biodiversity Indicators in Your Pocket 2010

Measuring progress towards halting biodiversity loss

Contents

Introduction

UK Biodiversity Indicators 2010

Biodiversity is the variety of life on earth. It includes the diversity of individual species, the genetic diversity within species and the range of ecosystems that support them. The UK Government has committed to two important international targets to protect biodiversity:

1. In 2001, European Union Heads of State or Government agreed that biodiversity decline should be halted, with the aim of reaching this objective by 2010.

2. In 2002, Heads of State at the United Nations World Summit on Sustainable Development committed themselves to achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional and national level, as a contribution to poverty alleviation and to the benefit of all life on Earth.

A suite of biodiversity indicators for the UK was first published in June 2007. The indicators show changes in aspects of biodiversity such as the population size of important species

or the area of land managed for wildlife. They provide part of the evidence to assess whether the targets set out above have been achieved.

Eighteen UK biodiversity indicators are presented in this document. The indicators are grouped under six focal areas aligned to those used by the Convention on Biological Diversity:

1. Status and trends in components of biodiversity

2. Sustainable use

3. Threats to biodiversity

4. Ecosystem integrity and ecosystem goods and services

5. Status of resource transfers and use

6. Public awareness and participation

Whilst indicators are useful tools for summarising broad trends and highlighting high-level messages, they can never describe all the changes in the UK's biodiversity. They are best seen, as their name suggests, as indicative of the general state of biodiversity. Whilst they will form the basis of the UK's assessment of progress towards the

biodiversity targets, other factors and sources of information are also taken into account.

Assessing indicators

Many indicators have a single measure which changes over time but where data cannot logically be combined, such as for the area of sensitive UK habitats affected by acidity and area affected by nitrogen, the indicator will have more than one measure. Each measure is assessed, using a set of traffic lights. The traffic lights assess change over time. They do not assess whether the measure has reached any published or implied targets, or indeed whether the status is 'good' or 'bad', although where targets have been set, these are identified in the indicator text.

The traffic lights are determined by identifying the period over which the change is to be assessed and comparing the value of the measure in the base or start year with the value in the end year.

For the measures within the indicators on trends in populations of selected species, statistical analysis techniques have been developed in collaboration with the data providers and the assessment is based on this analysis. A green or red traffic light is only applied when we can be confident that the change is statistically significant and not simply a product of random fluctuations.

For other indicators, the assessment has been made by comparing the value of the measure in the base or start year with the value in the end year against a standard threshold. Where the data allow it, a three year average is used to calculate the base year, to reduce the likelihood of any unusual year(s) unduly influencing the assessment. Where an indicator value has changed by less than the threshold of three per cent, the traffic light has been set at amber. The choice of three per cent as the threshold is arbitrary but is commonly used across other Government indicators.

Improving

little or no overall change

Deteriorating

Insufficient or no comparable data

The traffic lights only reflect the overall change in the measure from the base to latest year and do not reflect fluctuations during the intervening years.

Where data are available, two assessment periods have been used:

1. Long-term – an assessment of change since the earliest date for which data are available, although, if data do not precede 1996 a long-term assessment is not made.
2. Short-term – an assessment of change since 2000 (or the closest date for which data are available).

The individual indicators also have a third marker showing the direction of change in the last year. This period is too short for a meaningful assessment. However, when it exceeds a one per cent threshold, the direction of change is given simply as an acknowledgement of very recent trends and as a possible early warning of emerging trends.

Overview of assessment of change for all indicators

The individual assessments for each measure can be combined to produce an overall assessment.

This provides a summary of progress towards the 2010 commitments without the need to combine the indicators themselves.

The pie charts on page 8 display the numbers of measures that have shown an improvement (green traffic light), a deterioration (red traffic light), little or no overall change (amber traffic light) or that have insufficient data for an assessment to be made (white traffic light). Assessments of change over the longer term and since 2000 are shown.

As well as overall summaries based on all measures in the indicators, separate summaries for each focal area are shown which are based on the indicators and measures within that focal area. Focal areas 5 and 6 have very few measures and separate pie charts are not shown.

The table overleaf summarises traffic light assessments over the longer term and since 2000, for the 18 indicators and their 34 component measures.

Focal area, indicator number, title and individual measures (where applicable)	Long-term change[1]	Change since 2000
Focal area 1. Status and trends of the components of biological diversity		
1a. Populations of selected species (birds) — Breeding farmland birds	❌ 1970-2008	❌
1a. Populations of selected species (birds) — Breeding woodland birds	❌ 1970-2008	✅
1a. Populations of selected species (birds) — Breeding water and wetland birds	≈ 1975-2008	≈
1a. Populations of selected species (birds) — Breeding seabirds	✅ 1970-2008	❌
1a. Populations of selected species (birds) — Wintering waterbirds	✅ 1975-6 - 2007-8	❌
1b. Populations of selected species (butterflies) — Semi-natural habitat specialists	❌ 1976-2009	≈
1b. Populations of selected species (butterflies) — Generalist butterflies	≈ 1976-2009	≈
1c. Populations of selected species (bats)	❌ 1978-1992	✅
2. Plant diversity — Arable and horticultural land	✅ 1990-2007	✅
2. Plant diversity — Woodland and grassland	❌ 1990-2007	❌
2. Plant diversity — Boundary habitats	❌ 1990-2007	❌
3. UK priority species	⦁⦁⦁	✅
4. UK priority habitats	⦁⦁⦁	≈
5. Genetic diversity — Native sheep breeds	⦁⦁⦁	≈
5. Genetic diversity — Native cattle breeds	⦁⦁⦁	✅
6. Protected areas — Total extent of protected areas	✅ 1996-2009	✅
6. Protected areas — Condition of A/SSSIs	⦁⦁⦁	✅
Focal area 2. Sustainable use		
7. Woodland management	⦁⦁⦁	✅
8. Agri-environment land — Higher level, targeted schemes	✅ 1992-2009	✅
8. Agri-environment land — Entry type schemes	⦁⦁⦁	✅
9. Sustainable fisheries	✅ 1990-2008	✅

6

Focal area, indicator number, title and individual measures (where applicable)		Long-term change[1]	Change since 2000
Focal area 3. Threats to biodiversity			
10. Impact of air pollution	Acidity	✅ 1996-2005	≈
	Nitrogen	✅ 1996-2005	≈
11. Invasive species	Freshwater species	❌ 1960-2008	≈
	Marine species	❌ 1960-2008	❌
	Terrestrial species	❌ 1960-2008	❌
12. Spring Index		Not assessed	Not assessed
Focal area 4. Ecosystem integrity and ecosystem goods and services			
13. Marine ecosystem integrity		❌ 1982-2008	≈
14. Habitat connectivity	Broad-leaved, mixed and yew woodland	•••	•••
	Neutral grassland	•••	•••
15. Biological river quality		✅ 1990-2008	✅
Focal area 5. Status of resource transfers and use			
16. UK biodiversity expenditure		•••	✅
17. UK global biodiversity expenditure		•••	✅
Focal area 6. Public awareness and participation			
18. Conservation volunteering		•••	✅

✅ improving
≈ little or no overall change
❌ deteriorating
••• insufficient or no comparable data

1 The earliest available year is used as the baseline for assessment of long-term change. The base year used for each measure is shown in the table. Where data are unavailable, or do not precede 1996, a long-term assessment is not given.

Long term change*
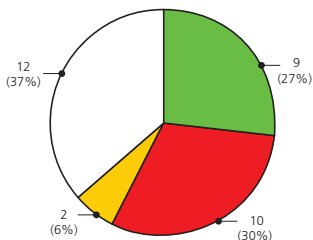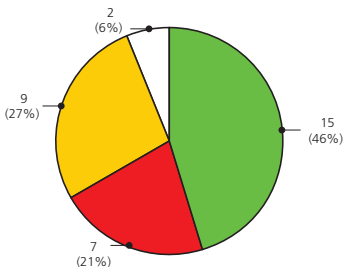
12
(37%)

9
(27%)

2
(6%)

10
(30%)

Change since 2000*

2
(6%)

9
(27%)

15
(46%)

7
(21%)

🟩 Showing improvement

🟥 Showing deterioration

🟨 Showing little or no overall change

⬜ Insufficient data

*Based on 33 measures, which make up 17 indicators (1 indicator is not assessed)

Assessment of change: all measures

Of the 33 measures used to compile the 'all measures' summary chart, 15 (46 per cent) show an improvement since 2000, compared with nine measures (27 per cent) showing improvement over the longer term. Those showing improvement since 2000 include bat populations, UK Biodiversity Action Plan priority species, the extent of protected areas, the percentage of woodland under certified management, sustainable fisheries, biological river quality, and expenditure on both UK and global biodiversity.

Those measures showing long-term deterioration include populations of farmland birds and woodland birds, populations of specialist butterflies, bat populations and plant diversity (in woodlands, grasslands and boundary habitats). Some of these measures have continued to deteriorate in the short term (e.g. farmland birds and the plant diversity of boundary habitats). Woodland bird populations have shown improvement since 2000, whilst specialist butterflies have shown little or no overall change.

Assessment of change by focal area

There were long-term declines for six measures (35 per cent) within focal area 1 (status and trends of biological diversity), reflecting the very large declines in bird, butterfly and bat populations seen in the 1970s and 80s. Since 2000, these long term declines have generally slowed, with some measures previously assessed as deteriorating showing either improvement or little or no overall change since 2000. These conclusions should be viewed with some caution as changes are more difficult to assess over the short term. Two measures within focal area 1, breeding seabirds and wintering waterbirds, show a long-term improvement, but deterioration since 2000.

The indicators in focal areas 3 (threats to biodiversity) and 4 (ecosystems) show little difference in their short-term assessments. Focal area 3 has the greatest proportion of assessments showing deterioration in both the long and short-term, reflecting a pattern of continuing or growing threat to biodiversity in the UK.

Long term change   **Change since 2000**

Focal area 1 – Status and trends of the components of biological diversity
(Based on 17 measures which make up 6 indicators)
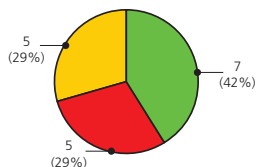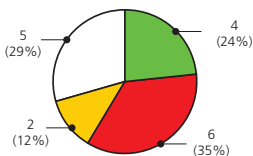
Focal area 2 – Sustainable use
(Based on 4 measures which make up 3 indicators)
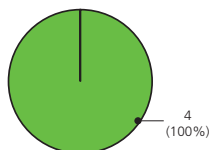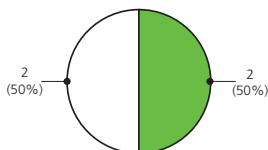
Focal area 3 – Threats to biodiversity
(Based on 5 measures which make up 2 indicators)
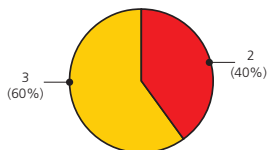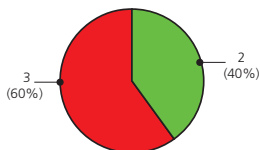
Focal area 4 – Ecosystem integrity and ecosystem goods and services
(Based on 4 measures which make up 3 indicators)
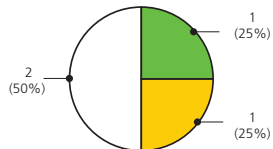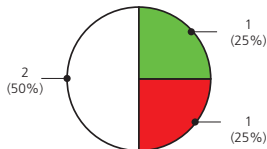
■ Showing improvement   ■ Showing deterioration

■ Showing little or no overall change   □ Insufficient data

1a. Trends in populations of selected species (wild birds)

Wild bird populations: breeding farmland birds, woodland birds, waterbirds and seabirds, 1970 to 2008

United Kingdom
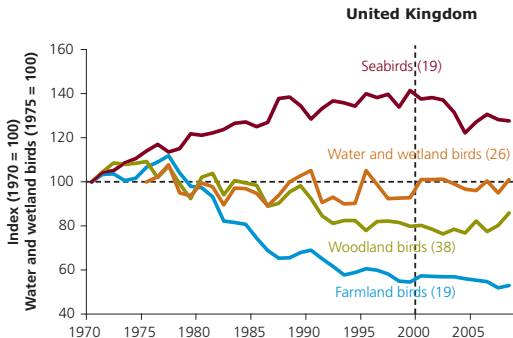
Notes: Figures in brackets show the number of species included in each measure.

Source: Royal Society for the Protection of Birds, British Trust for Ornithology, Defra, Joint Nature Conservation Committee.

Assessment of change in bird populations			
	Long term	Since 2000	Latest year
Breeding farmland birds	❌ 1970-2008	❌	Increased (2008)
Breeding woodland birds	❌ 1970-2008	✅	Increased (2008)
Breeding water and wetland birds	≈ 1975-2008	≈	Increased (2008)
Breeding seabirds	✅ 1970-2008	❌	No change (2008)
Wintering waterbirds	✅ 1975-6 - 2007-8	❌	Increased (2007-8)

Wild bird populations: wintering waterbirds, 1975-6 to 2007-8

United Kingdom
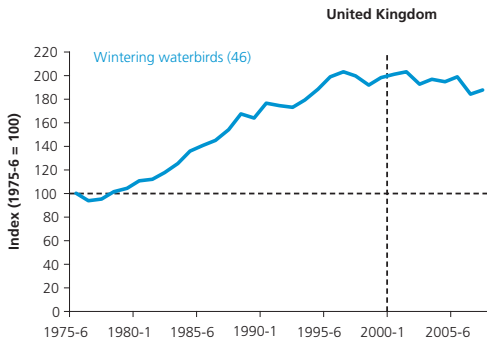
Notes: Figures in brackets give the number of species included in the measure.

Source: Royal Society for the Protection of Birds, British Trust for Ornithology, Defra, Joint Nature Conservation Committee, the Wildfowl and Wetlands Trust.

- Bird populations are considered to be a good indicator of the broad state of wildlife and the countryside because they occupy a wide range of habitats and they tend to be near or at the top of the food chain.

- Between 1970 and 2008, populations of breeding farmland birds fell by 47 per cent. Populations of woodland birds fell by 23 per cent between 1978 and 2002 but then rose to 14 per cent below the 1970 level by 2008. The populations of breeding water and wetland birds showed little or no overall change between 1975 and 2008, despite year-on-year fluctuation. Populations of breeding seabirds rose by 41 per cent between 1970 and 1999, but subsequently fell to 27 per cent above the 1970 level.

- Since 2000, the measures for breeding farmland birds and seabirds declined by eight per cent and seven per cent respectively, whilst the measure for breeding woodland birds increased by seven per cent. The breeding water and wetland bird measure showed little or no overall change over the same period.

- In 2007-8, the wintering waterbirds population measure was 88 per cent higher than in 1975-6. Populations peaked in 1996-7, but there has been a decline in more recent years; the measure has fallen by seven per cent since the winter of 2000-1. The wintering waterbirds chart is generated from raw data and should not be compared directly with the smoothed, underlying trend chart shown in previous publications.

1b. Trends in populations of selected species (butterflies)

Trends in butterfly populations for habitat specialists and generalist (wider countryside) species, 1976 to 2009
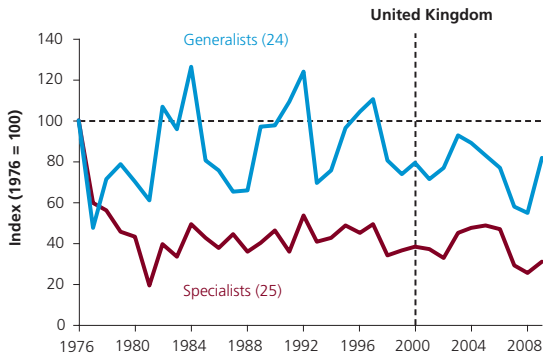
Notes: Figures in brackets show the numbers included in each category.

Source: Butterfly Conservation, Centre for Ecology and Hydrology, Defra.

Assessment of change in butterfly populations			
	Long term	Since 2000	Latest year
Semi-natural habitat specialists	❌ 1976-2009	≈	Increased (2009)
Generalist species of the wider countryside	≈ 1976-2009	≈	Increased (2009)

- Butterflies respond rapidly to changes in environmental conditions and habitat management, occur in a wide range of habitats, and are representative of many other insects.

- Since 1976, the measure for butterflies associated strongly with semi-natural habitats (specialists) and for those found in the wider countryside (generalists) show apparent declines of 69 per cent and 18 per cent respectively.

- Large fluctuations in numbers between years are typical features of butterfly populations. The assessment of change is therefore made on an analysis of the underlying trends undertaken by Butterfly Conservation and the Centre for Ecology and Hydrology.

- This analysis shows that since 1976 specialists have declined significantly but for generalists there has been little or no overall change (despite the apparent decline).

- Since 2000, specialists have shown a decline from 38 per cent to 31 per cent of the 1976 level. Generalists have shown a small increase from 79 per cent to 82 per cent of the 1976 level. However, the underlying analysis shows that there was little or no overall change for either measure.

1c. Trends in populations of selected species (bats)

Trends in widespread bat populations, 1999 to 2009
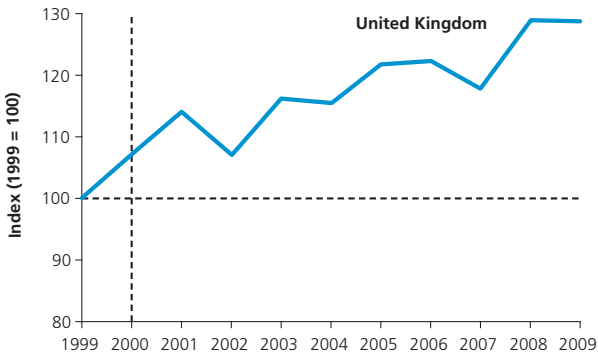
Notes: The headline measure is a composite index of six species: Daubenton's bat, noctule, serotine, lesser horseshoe, common pipistrelle and soprano pipistrelle.

Source: Bat Conservation Trust.
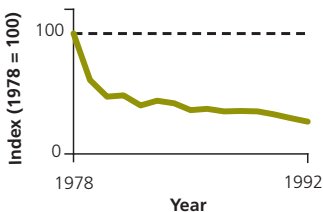
Notes: Estimate for combined (common and soprano) pipistrelle, 1978-1992. Although based on limited data, this places the more recent trends in a longer-term context.

Source: Bat Conservation Trust (data from Harris, S., Morris, P., Wray, S., & Yalden, D. (1995). *A review of British mammals: population estimates and conservation status of British mammals other than cetaceans.* JNCC, Peterborough.

Assessment of change in widespread bat populations			
	Long term	Since 2000	Latest year
Bat populations	❌ 1978-1992	✅	No change (2009)

- Bat populations are considered to be a good indicator of the broad state of wildlife and landscape quality because they utilise a range of habitats across the landscape and are sensitive to pressures in the urban, suburban and rural environment.
- Bats have undergone severe declines historically. However, since 2000, bat populations have increased by 20 per cent.

2. Plant diversity

Change in plant species richness in the wider countryside, 1990 to 2007
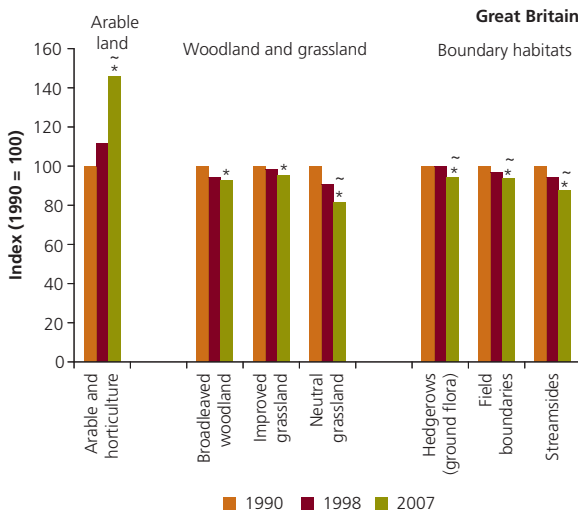
Notes: 1. * A statistically significant change between 1990 and 2007.
2. ~ A statistically significant change between 1998 and 2007.

Source: Centre for Ecology and Hydrology, Countryside Survey.

Assessment of change in plant diversity in the wider countryside			
	Long term	Since 1998	Latest year
Arable and horticultural land	✔ 1990-2007	✔	N/A
Woodland and grassland	✘ 1990-2007	✘	N/A
Boundary habitats	✘ 1990-2007	✘	N/A

- Within arable fields there was an increase in plant species richness (number of species per survey plot) both in the longer term (since 1990) and shorter term (since 1998).

- In woodland and grassland, plant diversity has declined in both the longer and shorter term. For neutral grassland, broadleaved woodland and improved grassland, plant species richness fell over the longer term by 19, 7 and 5 per cent respectively and by 10, 2 and 3 per cent since 1998.

- In boundaries, plant species richness of the ground flora has also declined in both the longer and shorter term. For streamsides, field boundaries and hedgerows plant species richness fell over the longer term by 13, 6 and 5 per cent respectively and by 7, 3 and 5 per cent since 1998.

3. Status of UK Biodiversity Action Plan priority species

Changes in the status of UK priority species, 1999 to 2008
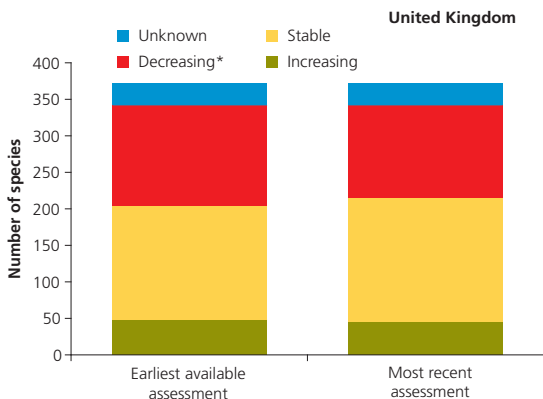
Notes: *'Decreasing' includes 17 species assessed as lost within the 'earliest available assessments' and 20 species assessed as 'lost' within the 'most recent assessments'. 74 per cent of the 'earliest available' assessments were made in 1999 or 2002, but the remainder were made in later years. 85 per cent of the 'most recent' assessments were made in 2008, but the remainder were made in earlier years. Based on 371 listed priority species.

Source: Joint Nature Conservation Committee, the UK Biodiversity Partnership and Defra.

Assessment of change in status of priority species			
	Long term	Since 1999	Latest year
Priority species that are stable or increasing	⦿	✓	N/A

Detailed status of UK priority species in 2008

United Kingdom

Legend:
- Increasing
- Fluctuating – probably increasing
- Stable
- Fluctuating – probably stable
- Fluctuating – probably declining
- Declining (slowing)
- Declining (continuing/accelerating)
- Lost (since BAP publication)
- Lost (pre BAP publication)

Pie chart values: 10%, 4%, 30%, 19%, 10%, 10%, 11%, 3%, 3%
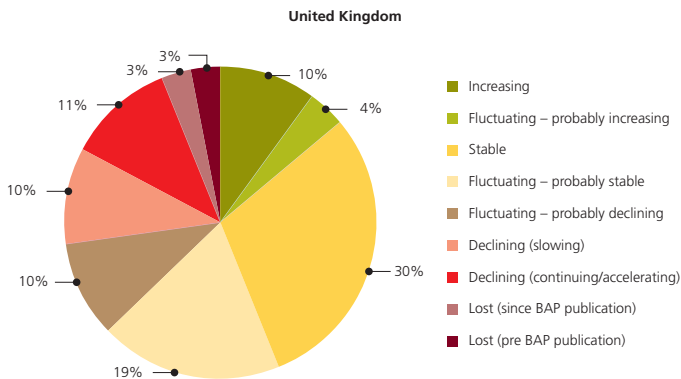
Notes: Based on 289 species for which an assessment was made in 2008.

Source: Joint Nature Conservation Committee, the UK Biodiversity Partnership and Defra.

- The UK Biodiversity Action Plan is the UK's national biodiversity strategy produced in response to the Convention on Biological Diversity. The Plan was revised in 2007 and the number of priority species increased but the indicator is based on the 371 species which were assessed between 1999 and 2008.

- An assessment of the status of the priority species has been provided every three years by experts across the UK.

- A status assessment is available in at least one of the assessment years for 339 species. Thirty-two species have had an unknown status over the period.

- Based on a comparison of the earliest available and most recent assessment for each species, the number either 'stable' or 'increasing' (in number or extent) has risen by 3.5 per cent from 202 to 214. The number decreasing (or lost) fell from 137 to 125. The number of species assessed as 'increasing' has fallen from 48 to 45.
- Of the 289 species for which an assessment was made in 2008, 88 are still declining and eight have been lost from the UK since the Plan was published in 1994. Those that are stable may have populations well below target levels.

4. Status of UK Biodiversity Action Plan priority habitats

Changes in the status of UK priority habitats, 1999 to 2008

Notes: 72 per cent of the 'earliest available' assessments were made in 1999 or 2002, but the remainder were made in later years. 81 per cent of the 'most recent' assessments were made in 2008, but the remainder were made in earlier years. Based on 45 listed priority habitats.

Source: Joint Nature Conservation Committee, the UK Biodiversity Partnership and Defra.

Assessment of change in status of priority habitats			
	Long term	Since 1999	Latest year
Priority habitats that are stable or increasing	⦙•••⦙	≈	N/A

Detailed status of the UK priority habitats in 2008

United Kingdom

Legend:
- Increasing
- Fluctuating – probably increasing
- Stable
- Fluctuating – probably stable
- Fluctuating – probably declining
- Declining (slowing)
- Declining (continuing/accelerating)

Pie chart values: 14%, 6%, 11%, 14%, 11%, 27%, 17%

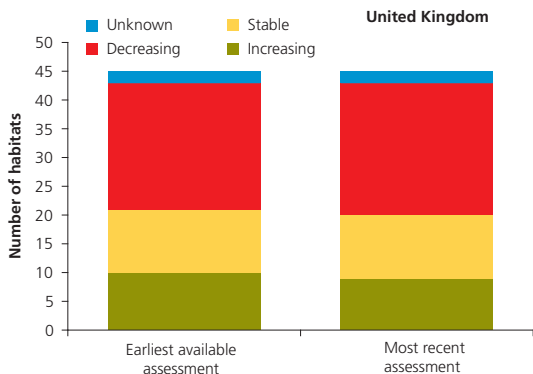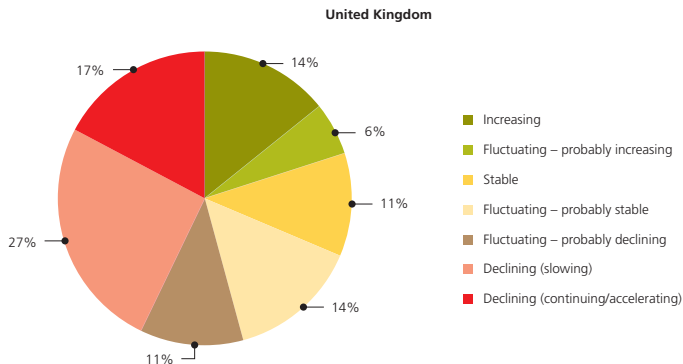**Notes:** Based on 35 habitats for which an assessment was made in 2008.

Source: Joint Nature Conservation Committee, the UK Biodiversity Partnership and Defra.

- The UK Biodiversity Action Plan is the UK's national biodiversity strategy produced in response to the Convention on Biological Diversity. The Plan was revised in 2007 and the number of priority habitats increased but the indicator is based on the 45 habitats which were assessed between 1999 and 2008.

- An assessment of the status of the priority habitats has been provided every three years by experts across the UK.

- A status assessment is available in at least one of the assessment years for 43 habitats. Two have remained 'unknown' throughout the period.

- Based on a comparison of the earliest available and most recent assessment for each habitat, the number either 'stable' or 'increasing' in area has fallen from 21 to 20 (2.5 per cent of the known habitats).
- Despite this position of little or no overall change, of the 35 habitats for which an assessment was made in 2008, 15 priority habitats (44 per cent) are still declining in extent.

5. Genetic diversity

Change in effective population size for native breeds of sheep and cattle at greatest risk of loss of genetic diversity, 2001 to 2007

United Kingdom
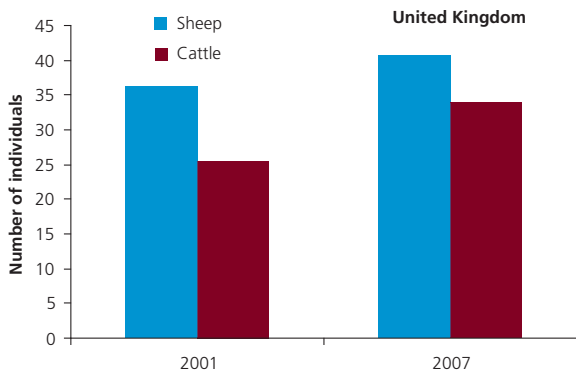
Notes: The 2001 values are based on assessments for 27 sheep and 18 cattle breeds. The 2007 values are based on assessments for 26 sheep and 20 cattle breeds. Breeds at greatest risk have the lowest effective population size and are a sub-set of the breeds assessed in each year.

Source: Scottish Agricultural College, Roslin Institute, Grassroots Systems Ltd.

Assessment of change in effective population size			
	Long term	Since 2001	Latest year
Native sheep breeds	•••	≈	N/A
Native cattle breeds	•••	✓	N/A

- Genetic diversity is an important component of biological diversity. Rare and native breeds of farm animals are part of our cultural heritage and are often associated with traditional land management required to conserve important habitats.

- The genetic diversity in UK breeds of cattle and sheep can be assessed by the effective population size, which accounts for the total number of animals in a population and the likely relatedness to other animals with which they breed. A low effective population size signifies a greater likelihood of in-breeding and risk of loss of genetic diversity.

- The mean effective population size for breeds most at risk of loss of genetic diversity has risen by 4.5 individuals for sheep breeds (12 per cent) and by 8.3 individuals for cattle (32 per cent). This increase for of sheep breeds is not definitive, owing to variability in the data.

- There has been no reported UK extinction of any breed of sheep or cattle since 2001.

6. Extent and condition of UK protected areas

Extent of nationally and internationally important protected areas: i) total extent; ii) Special Areas of Conservation; iii) Special Protection Areas, 1996 to 2009
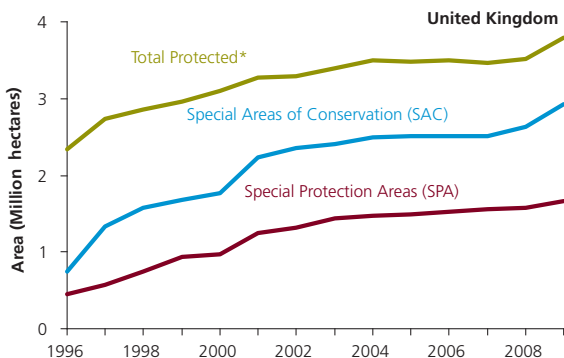
Notes: *Includes Areas/Sites of Special Scientific Interest (A/SSSI), SACs and SPAs. There is overlap between all categories of designation but each site contributes only once to the total area.

Source: Joint Nature Conservation Committee, Natural England, Countryside Council for Wales, Northern Ireland Environment Agency, Scottish Natural Heritage.

Assessment of change in area and condition of UK protected areas			
	Long term	Since 2000	Latest year
Total extent of protected areas	✓ 1996-2009	✓	Increased (2009)
Condition of A/SSSIs	●●●	✓	Increased (2009)

Cumulative proportion of protected areas in favourable or 'unfavourable-recovering' condition, by feature or by area, 2005 to 2009
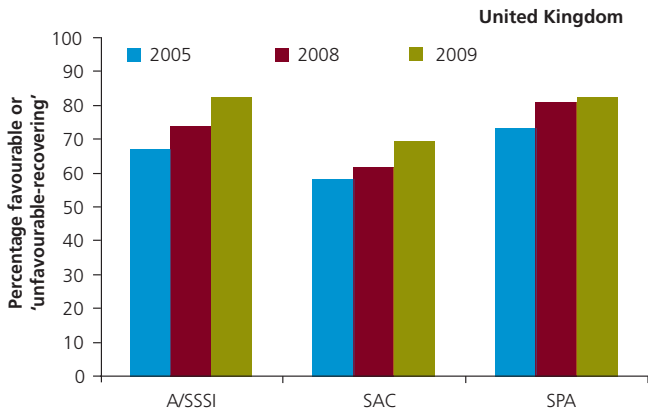
Notes: 1. No data for SSSI condition available for Wales.

2. England figures based on area; Scotland, Wales and Northern Ireland figures based on number of features.

Source: Joint Nature Conservation Committee, Natural England, Countryside Council for Wales, Northern Ireland Environment Agency, Scottish Natural Heritage.

- Designation of protected areas is a key mechanism for conserving biodiversity.
- The overall total extent of land and sea protected in the UK has increased from 2.3 million to 3.8 million hectares between 1996 and 2009 – an increase of 62 per cent.
- Since 2000 there has been a 22 per cent increase in the extent of protected areas; a large contribution to this has been from the marine environment following the designation of inshore and offshore marine sites under the Habitats Directive.

- Sites are designated with the aim of conserving specific biological or geological features. The condition of these features is assessed on a rolling cycle against agreed standards. A monitoring programme was initiated in 1998 to evaluate the effectiveness of management. The indicator identifies the proportion of these features – by feature or by area – that have appropriate conditions ('favourable') or have appropriate management and are 'recovering.'

- Since 2005 the percentage of sites in favourable or recovering condition has increased by 15 per cent for A/SSSIs, 11 per cent for SACs and 9 per cent for SPAs. This change reflects improved management of sites, but is also affected by a greater number of sites/features having been assessed over time. Although the condition indicator shows information for all three designations, only the A/SSSIs measure is assessed as this designation represents the largest area in the UK and underpins the designation of the majority of SACs and SPAs.

- There are separate targets in each of the countries of the UK to achieve favourable or recovering condition on 95 per cent of A/SSSIs, either by area or by number of features. The change in the percentage of A/SSSIs in favourable or recovering condition varies from country to country. Large increases are noted in England, with more modest changes in Scotland, and relatively little change in Northern Ireland. Sampling and assessment methods also vary between countries. More detailed information is available on individual country websites.

7. Woodland management

Percentage of woodland area under certified management, 2001 to 2009

United Kingdom
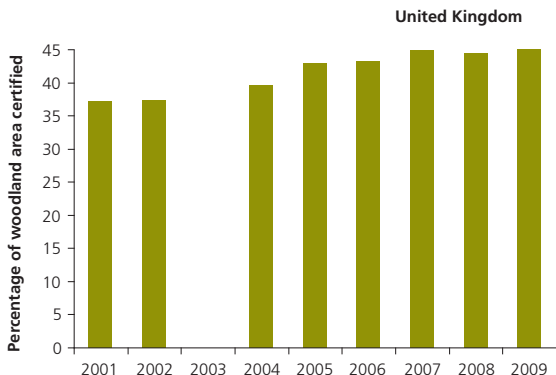
Source: Forestry Commission.

Assessment of change in area of sustainably managed woodland			
	Long term	Since 2001	Latest year
Percentage of certified woodland	⬤⬤⬤	✓	No change (2009)

- Certification of woodlands promotes responsible forest management to ensure that our natural heritage is not put at risk and that endangered wildlife habitat is not adversely affected.

- Across the UK, the percentage of woodlands under certified management schemes increased from 37 per cent in 2001 to 45 per cent in 2009.

- Within the UK in 2009, the percentage of woodlands certified in England was 31 per cent, 44 per cent in Wales, 56 per cent in Scotland and 74 per cent in Northern Ireland.

8. Agri-environment scheme management

Area of land covered by higher level or targeted agri-environment schemes, 1992 to 2009
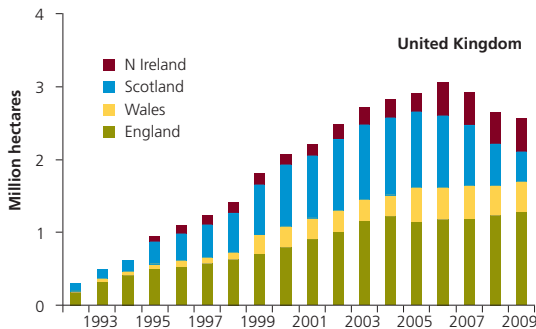
Notes: 1. The following schemes have been included here as higher level or targeted agri-environment schemes:

England: Environmentally Sensitive Areas (ESA), Countryside Stewardship (CS), and new Higher Level Stewardship (HLS).
Scotland: ESA, Countryside Premium, and Rural Stewardship.
Wales: ESA, Tir Cymen, and Tir Gofal.
N Ireland: ESA, Countryside Management.

2. Higher level or targeted agri-environment schemes have stricter criteria for qualification than other agri-environment schemes.

3. Data for 2009 are provisional.

Source: Welsh Assembly Government, Countryside Council for Wales, Scottish Government, Natural England, Department of Agriculture and Rural Development Northern Ireland, Defra.

Assessment of change in area of land covered by agri-environment schemes			
	Long term	Since 2000	Latest year
Higher level, targeted agri-environment schemes	✓ 1992-2009	✓	Decreased (2009)
Entry-type whole farm schemes	●●●	✓	Increased (2009)

31

Area of land covered by entry-level type, whole-farm agri-environment schemes, 2005 to 2009

England, Scotland and Wales
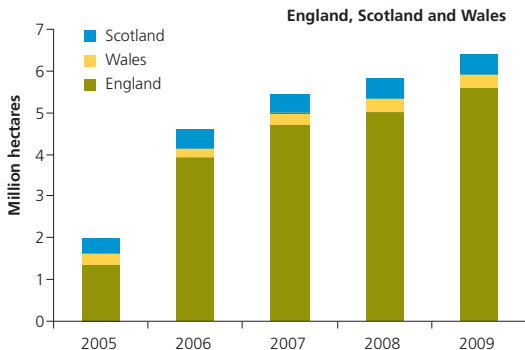
Notes: 1. The following agri-environment schemes have been defined as entry level schemes and are included here:

England: Entry Level Scheme and Organic Entry Level Scheme.

Scotland: Land Management Contract Menu Scheme and Land Managers Options.

Wales: Tir Cynnal.

2. Entry level schemes have less strict criteria for qualification than other agri-environment schemes like the Higher Level Stewardship schemes shown in the previous chart.

3. Data for 2009 are provisional.

Source: Welsh Assembly Government, Countryside Council for Wales, Scottish Government, Natural England, Defra.

- Agri-environment schemes require farmers to implement environmentally-beneficial management and demonstrate good environmental practice on their farm.

- The higher level or targeted schemes promote environmental management designed to: conserve wildlife; maintain and enhance landscape quality and character; protect the historic environment and natural resources, and to promote public access and the understanding of the countryside.

- The entry level schemes aim to encourage large numbers of farmers, across all farmland, to implement simple and effective environmental management on their farms that goes beyond the Single Payment Scheme requirements to maintain land in good agricultural and environmental condition.

- In 2009 the total area of land in higher level or targeted agri-environment agreements in the UK was just below 2.6 million hectares, equivalent to 15 per cent of UK agricultural land. There were 6.4 million hectares in entry level schemes in England, Scotland and Wales.

- In England, 14 per cent of agricultural land is managed under higher level or targeted schemes; 27 per cent in Wales; 7 per cent in Scotland and 46 per cent in Northern Ireland.

- In England, 60 per cent of the agricultural land is managed under entry-level type schemes; 19 per cent in Wales; and 9 per cent in Scotland. In England the area includes land managed in Organic Entry Level Stewardship.

- The majority of land in higher level schemes is also in an entry-level type scheme, therefore the areas cannot be summed.

9. Sustainable fisheries

Percentage of fish stocks harvested sustainably and at full reproductive capacity, 1990 to 2008

United Kingdom

Y-axis: Percentage of fish stocks (0 to 60)
X-axis: 1990 to 2008
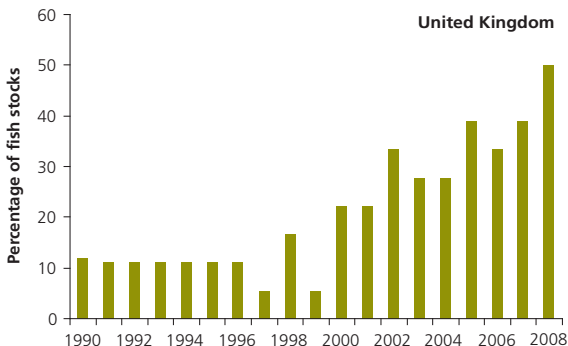
Notes: Based on 18 stocks for which accurate time series are available, derived from stock assessment reports.

Source: International Council for the Exploration of the Sea, Centre for Environment, Fisheries and Aquaculture Science.

Assessment of change in stocks harvested sustainably and at full reproductive capacity			
	Long term	Since 2000	Latest year
Sustainable fisheries	✓ 1990-2008	✓	Increased (2008)

- Sustainable fisheries will help to ensure our marine ecosystems remain diverse and resilient, and provide a long-term and viable fishing industry.

- During the 1990s the percentage of the 18 indicator fish stocks considered to be harvested sustainably and at full reproductive capacity ranged from six per cent to 17 per cent – it was 22 per cent in 2000, but increased to 50 per cent by 2008.

- Despite these increases, between 50 to 78 per cent of the indicator stocks have either reduced reproductive capacity or have been harvested unsustainably since 2001.

- For most of the stocks now considered to be fished sustainably, further reductions in fishing rates would improve the long-term yield.
- The number of stocks included in the index has reduced from 20 to 18, as for two stocks it is no longer possible to evaluate status. Excluding these two stocks shifts the value of the indicator upwards by 3 to 5 percentage points in 2008 but otherwise does not affect the assessment of change.

Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication, 1996 to 2005
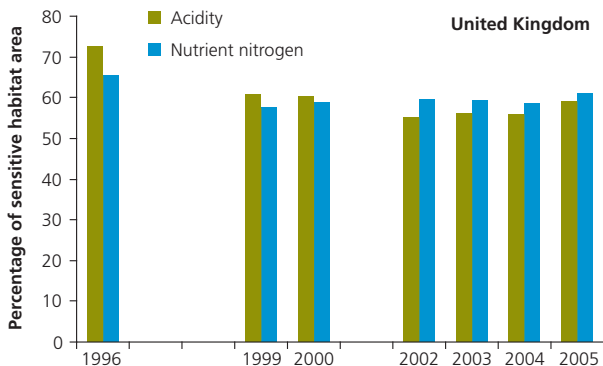
Notes: Since 2002 inclusion of nitric acid has increased the estimates of total nitrogen deposition leading to some increases in critical load exceedance compared with earlier periods; each bar represents a three year average to reduce year to year variability.

Source: Centre for Ecology and Hydrology.

Assessment of change in area of sensitive habitat exceeding air pollution critical loads			
	Long term	Since 2000	Latest year
Area affected by acidity	✅ 1996-2005	≈	N/A
Area affected by nitrogen	✅ 1996-2005	≈	N/A

- Critical loads are thresholds above which the deposition of pollutants causing acidification and eutrophication (nitrogen deposition) is harmful to the environment. The pollutants mainly arise as a result of emissions from livestock waste and burning fossil fuels. Around a third of UK land area is sensitive to acid deposition, and a third to eutrophication (with some sensitive to both).

- In 1996, the percentage area of sensitive habitats where acid deposition exceeded critical loads was 73 per cent, declining to 59 per cent by 2005. The percentage area remained virtually unchanged between 2000 and 2005.
- The percentage area of sensitive habitats where nitrogen deposition exceeded critical loads fell from 65 per cent in 1996 to 61 per cent in 2005. The percentage area remained virtually unchanged between 2000 and 2005.

11. Impact of invasive species

Changes in the extent of widely established invasive non-native species in freshwater, marine and terrestrial environments, 1960 to 2008

Great Britain

Number of invasive species established in either more than 10 per cent or more than 50 per cent of the land area or extent of coastline in Great Britain:

- more than 50 per cent
- 10 to 50 per cent
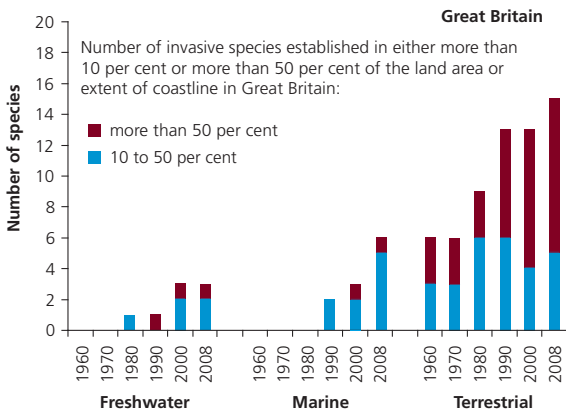
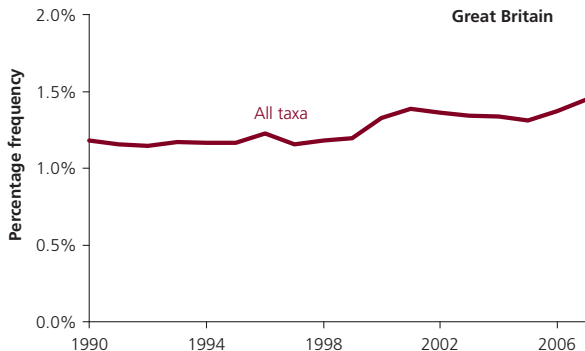**Source:** Centre for Ecology and Hydrology, British Trust for Ornithology, Marine Biological Association and the National Biodiversity Network Gateway.

Assessment of change in the impact of invasive species			
	Long term	Since 2000	Latest year
Freshwater species	❌ 1960-2008	≈	N/A
Marine species	❌ 1960-2008	❌	N/A
Terrestrial species	❌ 1960-2008	❌	N/A

Proportion of non-native species in samples of birds, mammals, plants and marine organisms, 1990 to 2007

Great Britain

All taxa

- Non-native species are those that have reached Britain by accidental human transport, deliberate human introduction, or which arrived by natural dispersal from a non-native population in Europe. Only species that arrived since 1500 are considered.

- Most non-native species are considered benign or positive but a few have a negative impact on native species through the spread of disease, competition for resources, or by direct consumption, parasitism or hybridisation. Invasive non-native species have one or more of these negative impacts and a high capacity for spread to natural and semi-natural habitats.

- Over the period 1990 to 2007, the proportion of records of non-native species in samples of birds, mammals, plants and marine life rose by about 23 per cent.

- Out of 3,500 non-native species in Britain, the 49 with the greatest potential impact on native biodiversity have been assessed for the extent to which they are established in Great Britain. The number of these 'most invasive' non-native species established in or along more than ten per cent of Great Britain's land area or coastline has increased since 1960 in the freshwater, terrestrial and marine environment, increasing the likely pressure on native biodiversity.

12. Spring Index

Index of the timing of biological spring events in the UK, 1891 to 1947 and 1999 to 2009
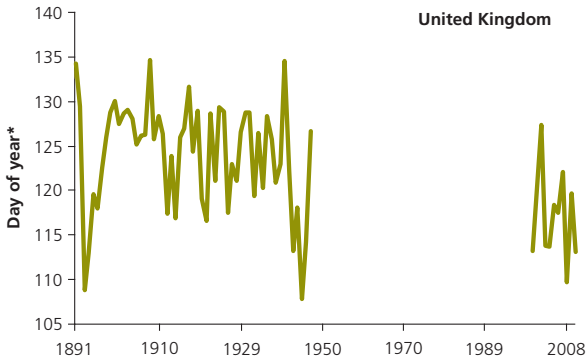
Notes: * Number of days after January 1st (e.g. day 121 = May 1st).

Source: UK Phenology Network.

This is a context indicator and as such is not assessed.

- The UK Spring Index shows how changes in climate can lead to changes in the timing of biological events and is calculated from the annual mean observation date of the following four events: first flowering of Hawthorn, first flowering of Horse Chestnut, first recorded flight of the Orange Tip Butterfly and first sight of a Swallow.

- The 1891-1947 data were mostly collected by the Royal Meteorological Society and the 1999-2009 data by the UK Phenology Network.

- While there is year to year fluctuation, on average spring events in the UK occurred seven days earlier in the years 1999 to 2009 than between 1891 and 1947. These changes in the Spring Index are strongly linked to increases in temperature during March and April.

13. Marine ecosystem integrity (size of fish in the North Sea)

Proportion of large fish (equal to or larger than 40cm), by weight, in the northern North Sea, 1982 to 2008
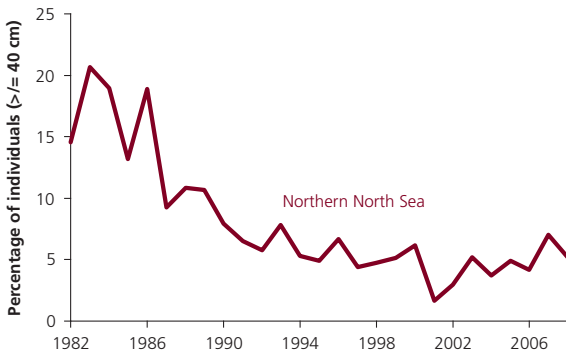
Source: Marine Scotland, Centre for Environment, Fisheries and Aquaculture Science.

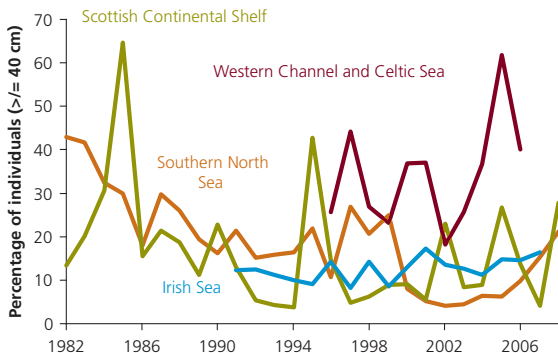| Assessment of change in the proportion of large individuals in North Sea fish populations			
	Long term	Since 2000	Latest year
Northern North Sea	❌ 1982-2008	≈	Decreased (2008)

Proportion of large fish (equal to or larger than 40cm), by weight, in the Western Channel and Celtic Sea, Irish Sea, Scottish Continental Shelf, and Southern North Sea, 1982 to 2008

Source: Marine Scotland, Centre for Environment, Fisheries and Aquaculture Science.

- Changes in the size structure of fish populations and communities reflect changes in the health of the fish community.

- This indicator shows changes in the proportion of large fish (40cm or greater in length) in the northern part of the UK area of the North Sea.

- There has been a steady decline in the proportion of large fish, by weight, in the northern North Sea since 1982. The proportion fell from around 15 per cent of the fish community in 1982 to around five per cent in 2008, although there has been little overall change since 2000.

- The measure for the northern North Sea is used as the main indicator because it is based on the largest data set and provides the most reliable indicator of change. In addition, the North Sea supports important fisheries and several are still recovering from over-exploitation. In common with the northern North Sea, there has been little or no overall change in other seas around the UK since 2000, although there are some early suggestions of a modest increase in recent years.

14. Habitat connectivity

Change in habitat connectivity for selected broad habitats in the wider countryside, 1990 to 2007
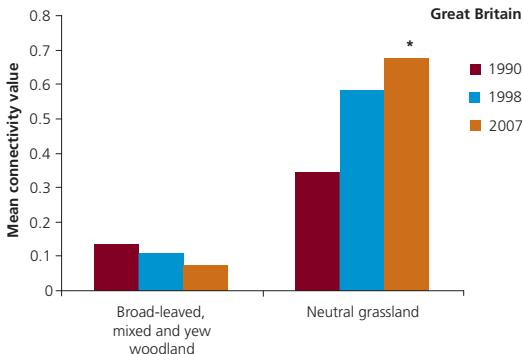
Notes: 1. The mean connectivity value is a measure of the relative connectivity on a scale of 0 to 100. Typical values are less than 1.

2. Change shown by asterisk (*) indicates a statistically significant change between 1990 and 2007. No other changes are statistically significant.

Source: Forest Research, Centre for Ecology and Hydrology.

Assessment of change in habitat connectivity for selected broad habitats			
	Long term	Since 1998	Latest year
Broad-leaved, mixed and yew woodland	◉◉◉	◉◉◉	N/A
Neutral grassland	◉◉◉	◉◉◉	N/A

- In this indicator, connectivity is a measure of the size and distribution of patches of woodland and neutral grassland, and the relative ease with which typical species of each can move through the landscape between the patches. Maintaining and improving connectivity is important in ensuring the long-term survival of biodiversity in a fragmented landscape, especially under a changing climate.

- The indicator shows little or no overall change in the degree of connectivity for broad-leaved, mixed and yew woodland between 1990 and 2007. Although not shown, over the same period there has been an increase in the area of broad-leaved woodland. The lack of a corresponding statistically significant change in connectivity may be related to changes in woodland pattern, changes in the wider landscape, or both.

- The indicator shows an increase in the degree of connectivity for neutral grassland between 1990 and 2007, although the overall change between 1998 and 2007 is not statistically significant. Between 1990 and 2007 there has been an increase in the overall habitat area. The increase in connectivity is most likely to be related to an increase in habitat area, but there may also be effects from changes in habitat pattern in the wider landscape.

- The indicator is based on an analysis of changes in land cover recorded in Countryside Survey – a detailed periodic audit of a statistically representative sample of land across Great Britain. Expert opinion was used to assess the relative likelihood of movement, by species characteristic of each habitat, between habitat patches, across different intervening land cover types found in the survey.

- Further analysis is required to better explain the causes of the changes in connectivity (which may be due to changes in the extent of the habitat or changes around the habitat blocks). Until this analysis has been undertaken, the current information is insufficient for an assessment of change to be made, despite the statistically significant increase seen in connectivity in neutral grassland habitat.

15. Biological river quality

Length of UK rivers of good biological quality, 1990 to 2008
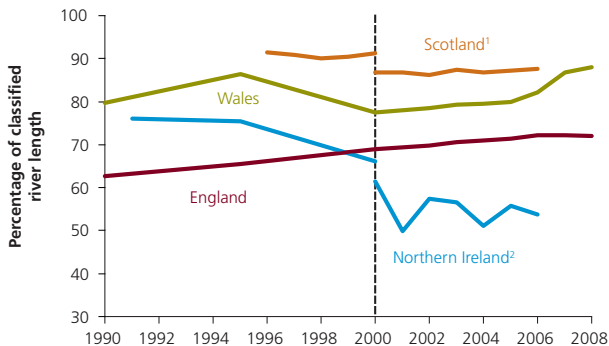
Notes: 1. Scottish river classification is based on a combined chemical, biological and aesthetic assessment and is not directly comparable with other countries. The Scottish classification network changed in 2000.

2. Northern Ireland network significantly expanded in 2000. 2000 figures are shown for both the new and the old basis.

Source: Environment Agency, Scottish Environment Protection Agency, Northern Ireland Environment Agency.

| Assessment of change in percentage of rivers of good biological quality (England and Wales)			
	Long term	Since 2000	Latest year
Biological river quality	✓ 1990-2008	✓	No change (2008)

- In 2008, the percentage of rivers of good biological quality in England was 72 per cent, up from 63 per cent in 1990 and 69 per cent in 2000. In Wales, 88 per cent of assessed rivers were of good biological quality, up from 80 per cent in 1990 and 78 per cent in 2000.

- In Scotland, the percentage of rivers of good quality in 2006 was 88 per cent. Between 2000 and 2006, this figure was stable between 86 per cent and 88 per cent, based on a combined chemical, biological and aesthetic assessment.

- In 2006, 54 per cent of rivers in Northern Ireland were of good biological quality.

- The traffic light assessments are based on the biological and chemical quality of river lengths in England and Wales only. It is not possible to produce aggregate UK measures.

- From 2007, England monitored river water quality using a smaller General Quality Assessment (GQA) monitoring network. Assessments prior to 2007 have been recalculated based on the smaller monitoring network. The results reported here, therefore, should not be compared with results previously reported.

16. UK biodiversity expenditure

Public sector expenditure on biodiversity in the UK, 2000-1 to 2008-9
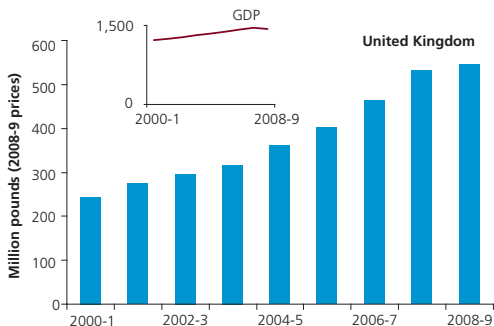
Notes: 1. Deflated using UK Gross Domestic Product deflator.

2. Inset chart shows UK Gross Domestic Product (billion pounds), 2000-1 to 2008-9.

Source: Defra.

Assessment of change in public expenditure on UK biodiversity			
	Long term	Since 2000-1	Latest year
UK biodiversity expenditure	⊙⊙⊙	✓	Increased (2008-9)

- Spending is one way of assessing the priority that is given to biodiversity within Government.
- In 2008-9, £547 million pounds of public sector funding was spent on UK biodiversity.
- Since 2000-1 public sector spending on UK biodiversity has increased by 124 per cent. Over the same period GDP increased by 18 per cent.

17. Global biodiversity expenditure

UK Government funding for global biodiversity, 2000-1 to 2008-9

United Kingdom
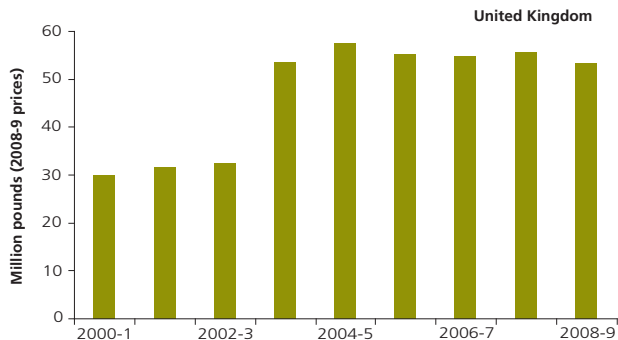
Notes: Deflated using UK GDP deflator.
Source: Defra.

Assessment of change in public expenditure on global biodiversity			
	Long term	Since 2000-1	Latest year
UK global biodiversity expenditure	⦙⦙⦙	✔	Decreased (2008-9)

- Spending is one way of assessing the priority that is given to global biodiversity within the UK public sector, and such funds are essential for the implementation of the Convention on Biological Diversity in developing countries.
- In 2008-9 UK funding for global biodiversity totalled £53 million.
- Global spending by the UK public sector has increased by 78 per cent since 2000-1 in real terms. During the same period UK GDP has grown by 18 per cent.

18. Conservation volunteering

Index of volunteer time spent in biodiversity conservation in selected UK conservation charities, 2000 to 2009
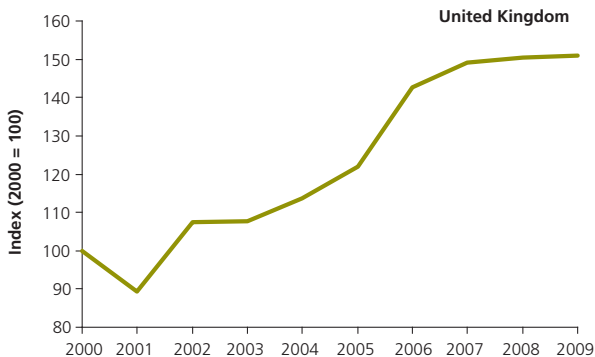
Notes: 1. Interpolated data have been used by Defra to fill missing years for Woodland Trust (2000 and 2001), Butterfly Conservation (2000 to 2002), and The Wildlife Trusts (2000 to 2004).

2. As data provided by RSPB were for financial years as opposed to calendar years, 2008-2009 data were allocated to 2008 and Defra estimates were made for 2009.

Source: Bat Conservation Trust, British Trust for Conservation Volunteers, British Trust for Ornithology, Butterfly Conservation, Natural England, Plantlife, Royal Society for the Protection of Birds, The Wildlife Trusts, Woodland Trust.

Assessment of change in volunteer time spent in biodiversity conservation			
	Long term	Since 2000	Latest year
Conservation volunteering	⊙	✓	Increased (2009)

- The amount of time people spend volunteering to assist in conservation reflects society's commitment to and understanding of biodiversity. The work conducted by conservation volunteers includes assisting with countryside management, carrying out surveys and inputting data, assisting with administrative tasks and fundraising.

- Between 2000 and 2009 there was a 51 per cent increase in time spent volunteering, and in 2009 the total time spent was equivalent to around one million working days, based on an index of the number of hours worked by volunteers in eight major UK conservation charities: Bat Conservation Trust, British Trust for Conservation Volunteers, British Trust for Ornithology, Butterfly Conservation, Plantlife, Royal Society for the Protection of Birds, The Wildlife Trusts, Woodland Trust, and a public body: Natural England.

Enquiries, and for other information

This publication has been produced by Natural Environment Science, Environment Statistics Service and UK Biodiversity Policy Teams (Defra) working with the Joint Nature Conservation Committee (JNCC).

Editorial/Project team:
Defra: Mark Stevenson, Stephen Hall, and David Novelli.
JNCC: James Williams, Linda Birkin, Cathy Gardner, and Ulric Wilson.

Steering Group members: Sarah Webster (Defra), Karen Haysom (Wildlife and Countryside Link), Keith Porter (Natural England), Neil McCulloch (Northern Ireland Environment Agency), Ed Mackey (Scottish Natural Heritage), David Allen (Countryside Council for Wales), Richard Evans (Welsh Assembly Government), Sallie Baillie (Forestry Commission).

We would welcome feedback on this publication. If you have any comments or questions about the published biodiversity indicators please contact:
- E-mail: enviro.statistics@defra.gsi.gov.uk
- Address: Environment Statistics Service, Defra, 6F Ergon House, c/o, Nobel House, 17 Smith Square, London SW1P 3JR

For enquiries about wider aspects of biodiversity conservation please refer to the JNCC website below, or contact Defra's Biodiversity Policy Unit:
- E-mail: UKBP@defra.gsi.gov.uk
- Address: The Biodiversity Policy Unit, European Wildlife Division, Department for Environment, Food and Rural Affairs Zone 1/10b, Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6EB

For enquiries about the future development of the indicators, please contact:
- Mark Stevenson at Mark.J.Stevenson@defra.gsi.gov.uk

For further details on all the indicators, including data sources and assessment methods, please visit the Joint Nature Conservation Committee (JNCC) website:
- www.jncc.gov.uk/biyp.

For other environmental statistics and indicators please also visit:
- www.defra.gov.uk/evidence/statistics/environment/

Notes

Notes

Notes

Department for Environment,
Food and Rural Affairs
Nobel House
17 Smith Square
London SW1P 3JR
Tel: 020 7238 6000

www.defra.gov.uk

defra
Department for Environment
Food and Rural Affairs