UK Biodiversity Indicators in Your Pocket 2011

Image Credits:

1. Lochwinnoch RSPB Reserve. Family day & minibeast hunt, children pond dipping. August 2004. ©Andy Hay (rspb-images.com).

2. Lower Lough Erne RSPB reserve, County Fermanagh, Northern Ireland. ©David Wootton (rspb-images.com)

3. Guillemots (*Uria aalge*) on the Isle of May NNR. ©Lorne Gill / Scottish Natural Heritage.

4. Blue tit (*Cyanistes caeruleus*) perching on a lichen covered branch. ©Lorne Gill / Scottish Natural Heritage

5. Common hawker dragonfly (*Aeshna juncea*), Whitlaw Mosses NNR. ©Lorne Gill / Scottish Natural Heritage.

6. Volunteers digging out reeds, Leighton Moss RSPB reserve. ©Geoff Harris (rspb-images.com)

7. Red Squirrel (*Sciurus vulgaris*) feeding from a peanut feeder. ©Lorne Gill / Scottish Natural Heritage

8. Flowering primrose (*Primula vulgaris*). ©Lorne Gill / Scottish Natural Heritage.

9. The Puffin (a former fishing vessel) takes visitors on wildlife & birdwatching trips around Troup Head RSPB reserve. Scotland. May 2006. ©Andy Hay (rspb-images.com)

10. Northern marsh orchid (*Dactylorhiza purpurella*). ©Lorne Gill / Scottish Natural Heritage.

UK Biodiversity Indicators in Your Pocket 2011

Measuring progress towards halting biodiversity loss

Contents

Introduction

UK Biodiversity Indicators 2011

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 indicators were originally developed by the UK Biodiversity Partnership Standing Committee to report on progress towards meeting international goals and targets to stem or slow the rate of biodiversity loss[1]. There have been significant developments in 2010 and 2011 in the international frameworks for biodiversity action and for assessing and reporting biodiversity change:

- In October 2010, the parties to the Convention on Biological Diversity, including the UK, agreed to a new set of goals and targets for the protection of biodiversity globally. They also agreed to continue to produce global and national indicators to track progress with 20 new targets (known as the 'Aichi targets').
- A new European target was adopted at the Environment Council in Brussels on 15th March 2010[2], and a new EU Biodiversity Strategy was published by the Commission at the start of May 2011.

In anticipation of these new targets, a review of the UK indicators was initiated in 2010 to ensure that they:
- Continue to be based on the most robust and reliable available data; and
- Remain relevant to the new international and European goals and targets.

Although this review is still in progress (see the discussions at the 5th UK Biodiversity Indicators Forum), it is clear that the current set, with some refinements, will remain relevant to the new international goals and targets. There are some gaps, where further indicators will need to be developed or where existing indicators will need to be adapted and interpreted. A rolling programme of changes to the indicator set has been agreed and will be implemented over the next three years.

In the meantime, and in the interests of transparency and accountability, the existing indicators will be updated and published on-line in May of each year.

The 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. The indicators show changes in the status of wildlife; species and habitats; the level of pressure or threat to biodiversity; and the scale of the response to these pressures. The indicators are still grouped under six focal areas aligned to those used by the Convention on Biological Diversity in its 2002 Strategic Plan and in the European biodiversity indicators, although they will be re-aligned to the themes of the Aichi targets in due course:

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

---

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. 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*'.**

2 **The new European target is '*Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss*'.**

Whilst indicators are useful tools for summarising broad trends and highlighting high-level messages, they can never describe all of the changes in the UK's biodiversity. They are best seen, as their name suggests, as indicative of these wider changes. 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.

The UK Biodiversity Indicators are dependent on a wide variety of data, provided by Government, research bodies and the voluntary sector. The presentation and assessment of the indicators has been cleared by the data providers, and the production and editing of the indicators has been overseen by independent Defra statisticians.

Previous versions of the indicators are available for download on the JNCC website www.jncc.defra.gov.uk/biyp, and links are provided to the full detail of each of the previous editions (stored on the National Archive).

Assessing indicators

Each indicator is composed of one or more measures which changes over time. Many indicators have a single measure, 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 separately using a set of 'traffic lights'. The traffic lights show 'change over time'. They do not show 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.

✓ Improving
≈ Little or no overall change
✗ Deteriorating
⋯ Insufficient or no comparable data

For the measures which show 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 there is sufficient confidence 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 difference between the value of the measure in the base or start year and 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 a 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.

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 table below 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	(red X) 1970-2009	(red X)
1a. Populations of selected species (birds) — Breeding woodland birds	(red X) 1970-2009	(yellow ≈)
1a. Populations of selected species (birds) — Breeding water and wetland birds	(red X) 1975-2009	(red X)
1a. Populations of selected species (birds) — Breeding seabirds	(green ✓) 1970-2009	(red X)
1a. Populations of selected species (birds) — Wintering waterbirds	(green ✓) 1975/6-2008-9	(red X)
1b. Populations of selected species (butterflies) — Semi-natural habitat specialists	(red X) 1976-2010	(yellow ≈)
1b. Populations of selected species (butterflies) — Generalist butterflies	(yellow ≈) 1976-2010	(yellow ≈)
1c. Populations of selected species (bats)	(red X) 1978-1992	(green ✓)
2. Plant diversity — Arable and horticultural land	(green ✓) 1990-2007	(green ✓)
2. Plant diversity — Woodland and grassland	(red X) 1990-2007	(red X)
2. Plant diversity — Boundary habitats	(red X) 1990-2007	(red X)
3. UK priority species	(insufficient data)	(green ✓)
4. UK priority habitats	(insufficient data)	(yellow ≈)
5. Genetic diversity — Native sheep breeds	(insufficient data)	(yellow ≈)
5. Genetic diversity — Native cattle breeds	(insufficient data)	(green ✓)
6. Protected areas — Total extent of protected areas	(green ✓) 1996-2010	(green ✓)
6. Protected areas — Condition of A/SSSIs	(insufficient data)	(green ✓)
Focal area 2. Sustainable use		
7. Woodland management	(insufficient data)	(green ✓)
8. Agri-environment land — Higher level, targeted schemes	(green ✓) 1992-2010	(green ✓)
8. Agri-environment land — Entry type schemes	(insufficient data)	(green ✓)

Focal area, indicator number, title and individual measures (where applicable)		Long term change[1]	Change since 2000
9. Sustainable fisheries		✅ 1990-2009	✅
Focal area 3. Threats to biodiversity			
10. Impact of air pollution	Acidity	✅ 1996-2007	✅
	Nitrogen	✅ 1996-2007	≈
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		❌ 1982-2009	✅
14. Habitat connectivity	Broad-leaved, mixed and yew woodland	⚬	⚬
	Neutral grassland	⚬	⚬
15. Biological river quality		✅ 1990-2009	✅
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		⚬	✅

[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.**

✅ Improving

≈ Little or no overall change

❌ Deteriorating

⚬ Insufficient or no comparable data

The individual assessments for each measure can be combined to produce an overall assessment. This provides a summary of progress without the need to combine the indicators themselves.

The pie charts below 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 focal areas 1-4 are shown which are based on the indicators and measures within each focal area. Focal areas 5 and 6 have very few measures and separate pie charts are not shown.

Assessment of change: all measures

Long-term change*
9
27%
12
37%
1
3%
11
33%

Change since 2000*
2
6%
8
24%
16
49%
7
21%

Showing improvement

Showing deterioration

Showing little or no overall change

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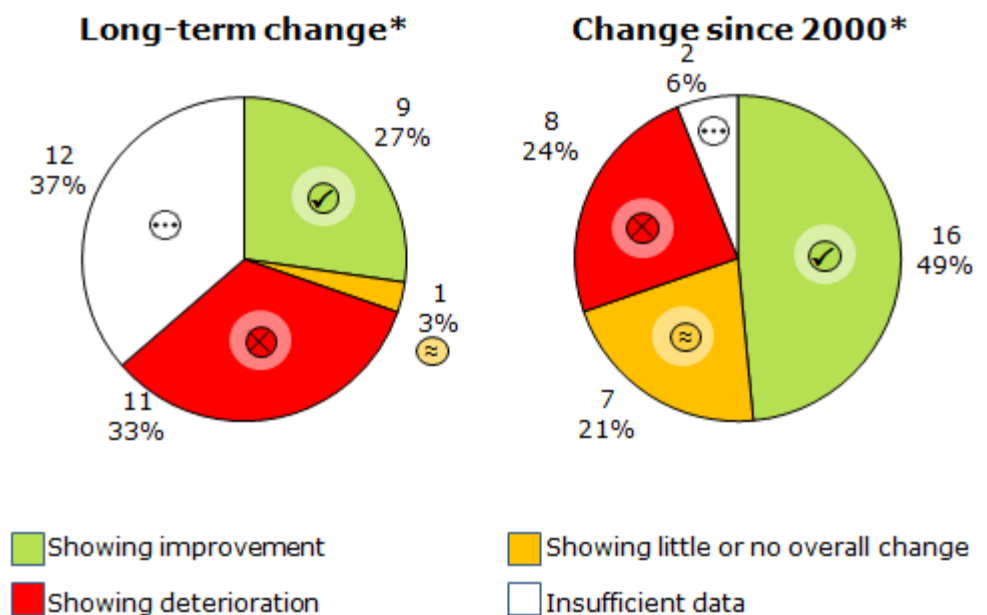
* Based on 33 measures, which make up 17 indicators (1 indicator is not asssessed)

Of the 33 measures used to compile the 'all measures' summary chart, 16 (49 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 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 woodland and grassland, and in 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). Bat populations have shown improvement since 2000, whilst specialist butterflies have shown little or no overall change.

Assessment of change: focal areas

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)

Long term change:
- 4 — 24%
- 5 — 29%
- 1 — 6%
- 7 — 41%

Change since 2000:
- 6 — 35%
- 6 — 35%
- 5 — 30%
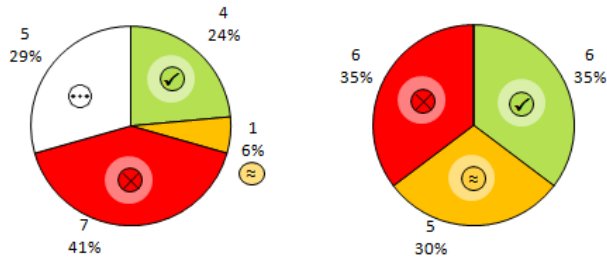
Focal area 2 - Sustainable use
(based on 4 measures which make up 3 indicators)

Long term change:
- 2 — 50%
- 2 — 50%

Change since 2000:
- 4 — 100%
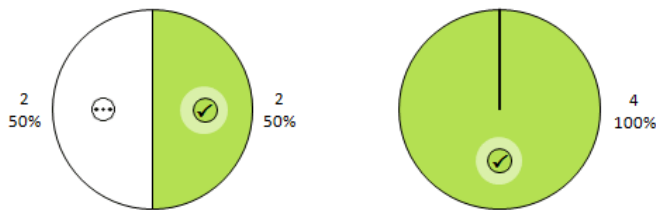
Focal area 3 - Threats to biodiversity
(based on 5 measures which make up 2 indicators)

Long term change:
- 2 — 40%
- 3 — 60%

Change since 2000:
- 1 — 20%
- 2 — 40%
- 2 — 40%
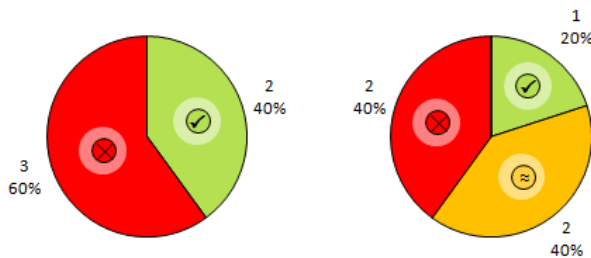
Focal area 4 - Ecosystem integrity and ecosystem goods and services
(based on 4 measures which make up 3 indicators)

Long term change:
- 1 — 25%
- 2 — 50%
- 1 — 25%

Change since 2000:
- 2 — 50%
- 2 — 50%

Legend:
- Showing improvement
- Showing deterioration
- Showing little or no overall change
- Insufficient data
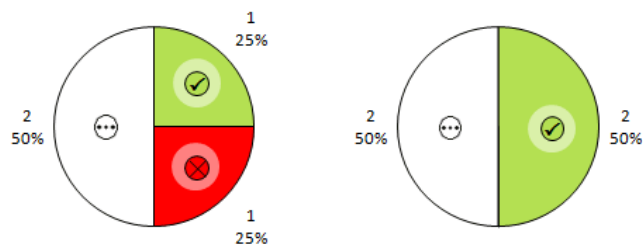
There were long-term declines for seven measures (41 per cent) within focal area 1 (status and trends of biological diversity), reflecting the very large declines in bird, butterfly and bat populations seen in the 1970s and 80s. Since 2000, these long-term declines have generally slowed, with some measures 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. 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.

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

Wild bird populations: breeding farmland birds, woodland birds, waterbirds and seabirds, 1970 to 2009
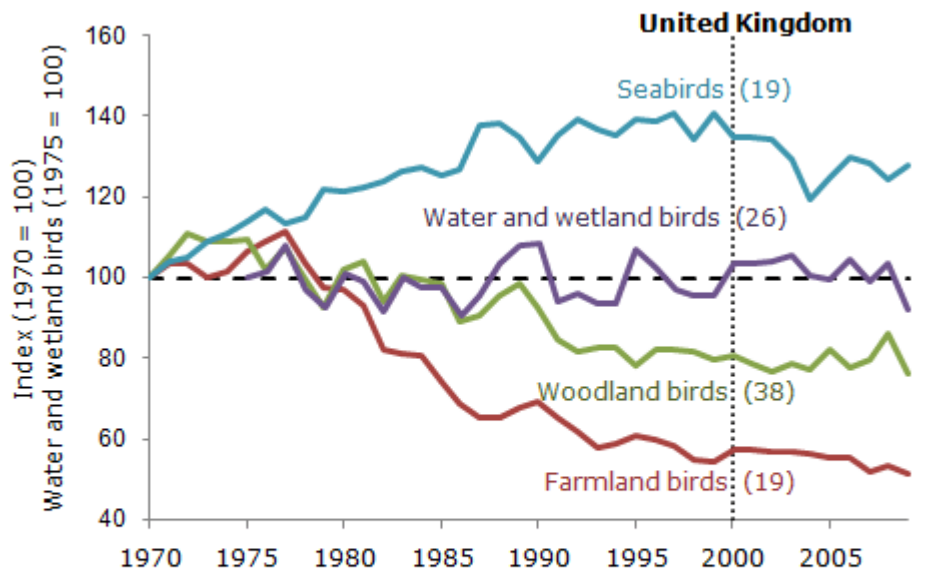
Notes: Figures in brackets show the number of species included in each measure.

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

Wild bird populations: wintering waterbirds, 1975-6 to 2009
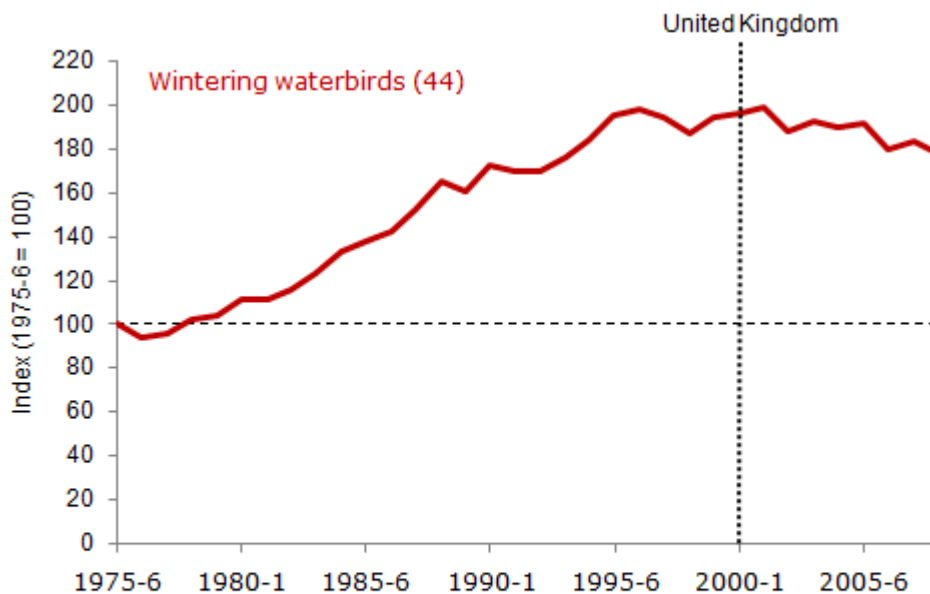
Notes: Figures in brackets show the number of species.

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	❌ 1970–2009	❌	Decreased (2009)
Breeding woodland birds	❌ 1970–2009	≈	Decreased (2009)
Breeding water and wetland birds	❌ 1975–2009	❌	Decreased (2009)
Breeding seabirds	✓ 1970–2009	❌	Increased (2009)
Wintering waterbirds	✓ 1975/6–2008/9	❌	Decreased (2008–9)

Note: In order to better capture patterns in the data, the assessment is made on the basis of smoothed data.

- Bird populations are considered to be a good indicator of the broad state of wildlife and countryside because they occupy a wide range of habitats and they tend to be near or at the top of the food chain. Moreover, considerable long-term data on bird populations have been collected.

- Between 1970 and 2009, populations of breeding farmland and woodland birds declined by 49 per cent and 24 per cent respectively.

- In 2009, populations of breeding seabirds were 28 per cent higher than the 1970 level. The population measure for breeding water and wetland birds was eight per cent lower than in 1975.

- Since 2000, populations of breeding farmland birds, woodland birds, water and wetland birds and seabirds, declined by 11 per cent, five per cent, 11 per cent and five per cent respectively.

- In 2008-9, the wintering waterbirds was 78 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 nine per cent since the winter of 2000-1.

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

Trends in butterfly populations for habitat specialists and generalist (wider countryside) species, 1976 to 2010
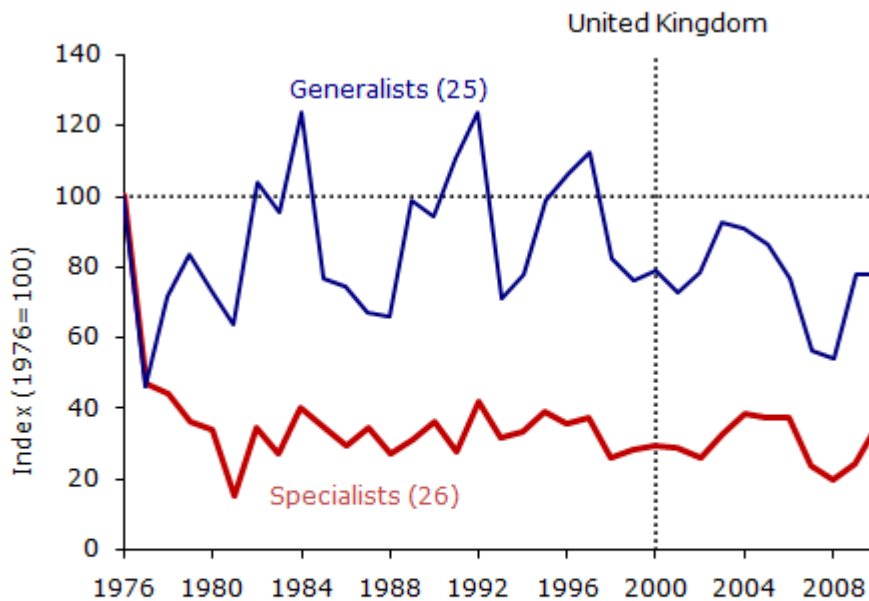
Notes: Figures in brackets show the number of species included in each category.

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

Assessment of change in butterfly populations			
	Long term	**Since 2000**	**Latest year**
Semi-natural habitat specialists	❌ 1976–2010	≈	Increased (2010)
Generalist species of the wider countryside	≈ 1976–2010	≈	No change (2010)

- Since 1976, the indices for butterflies associated strongly with semi-natural habitats (specialists) and for those found in the wider countryside (generalists) show apparent declines of 65 per cent and 23 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 & Hydrology.

- This analysis shows that since 1976 specialists have declined significantly but for generalists there has been little or no overall long-term change.

- Since 2000, specialists have shown a small increase from 29 per cent to 35 per cent of the 1976 level. Generalists have shown a small decrease from 79 per cent to 77 per cent of the 1976 level. However, the underlying analysis shows that there was little or no overall change for these measures.

- In 2010, specialists increased by 30 per cent over the previous year, whilst there was no change for generalists.

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

Trends in widespread bat populations, 1999 to 2010
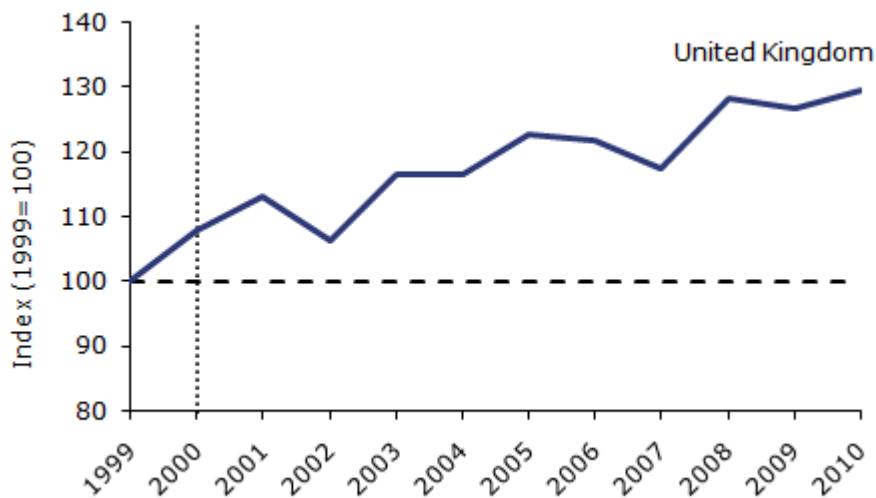
Notes: The headline measure is a composite index of six species: Daubenton's bat, noctule, serotine, lesser horseshoe bat, common pipistrelle and soprano pipistrelle.

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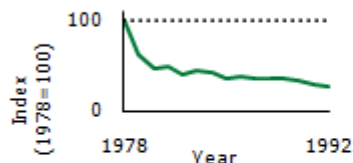
Notes: Estimate for combined (common and soprano) pipistrelle, 1978-1992. Although based on limited data, this places the more recent trends in a longer-term context.

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	✔	Increased (2010)

- 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
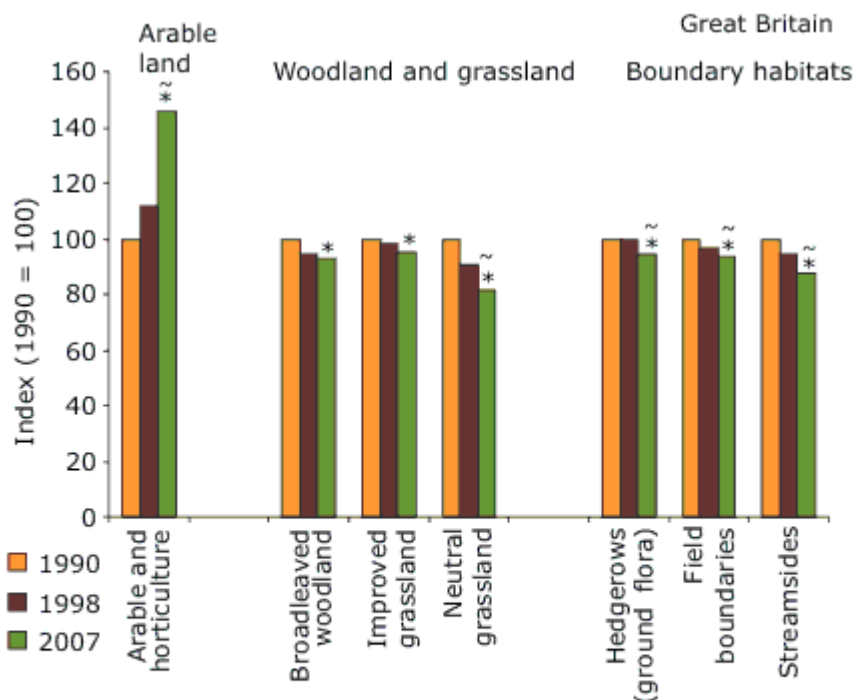
Notes: 1. * A statistically significant change between 1990 and 2007.
2. ~ A statistically significant change between 1998 and 2007.

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 long 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.

12

3. Status of UK Biodiversity Action Plan Priority Species

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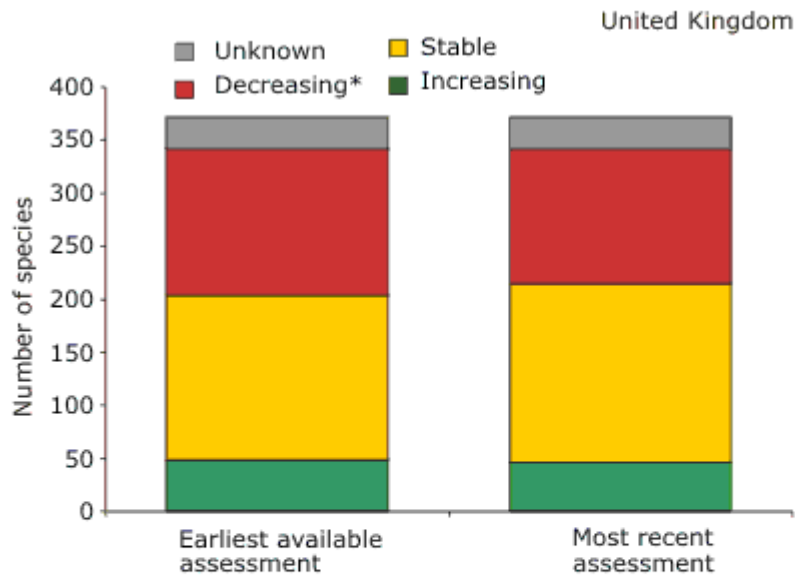
Notes: *'Decreasing' includes 17 species assessed as lost within the 'earliest available assessments' and 20 species assessed as 'lost' within the 'most recent assessments'. 74 per cent of the 'earliest available' assessments were made in 1999 or 2002, but the remainder were made in later years. 85 per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

Detailed status of UK Priority Species in 2008
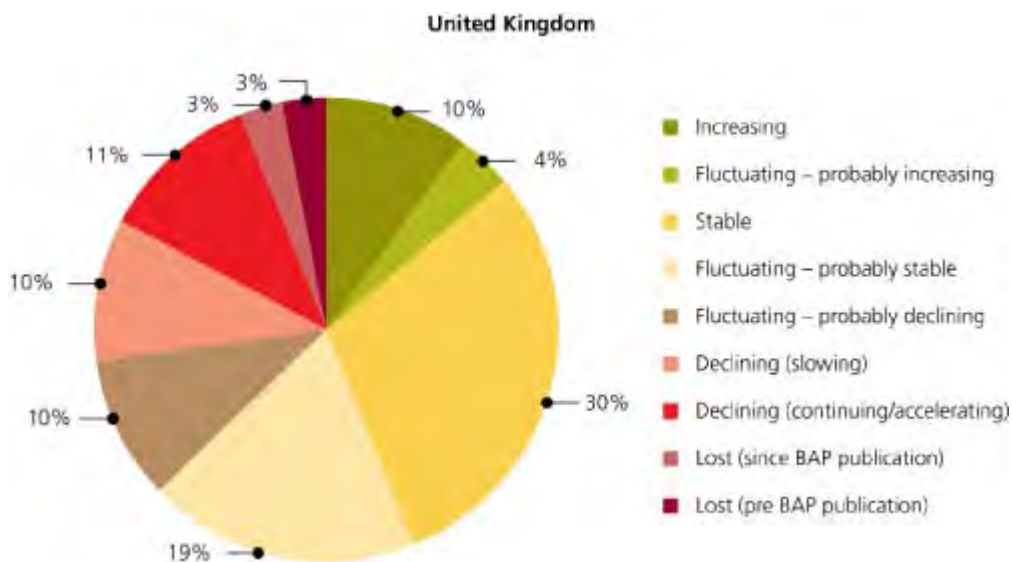
Assessment of change in status of Priority Species			
	Long term	**Since 1999**	**Latest year**
Priority Species that are stable or increasing	⊙	✓	N/A

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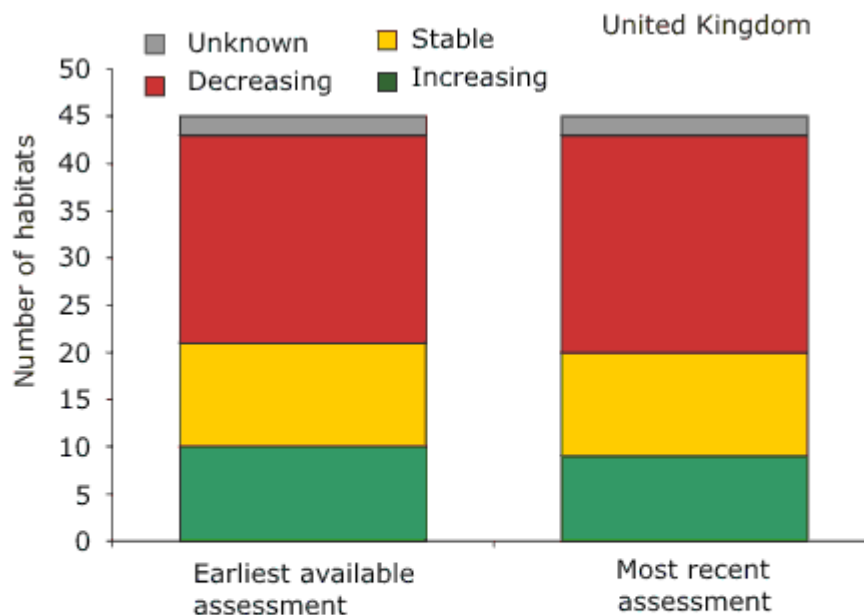
Notes: 72 per cent of the 'earliest available' assessments were made in 1999 or 2002, but the remainder were made in later years. 81 per cent of the 'most recent' assessments were made in 2008, but the remainder were made in earlier years. Based on 45 listed Priority Habitats.

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

Detailed status of the UK Priority Habitats in 2008
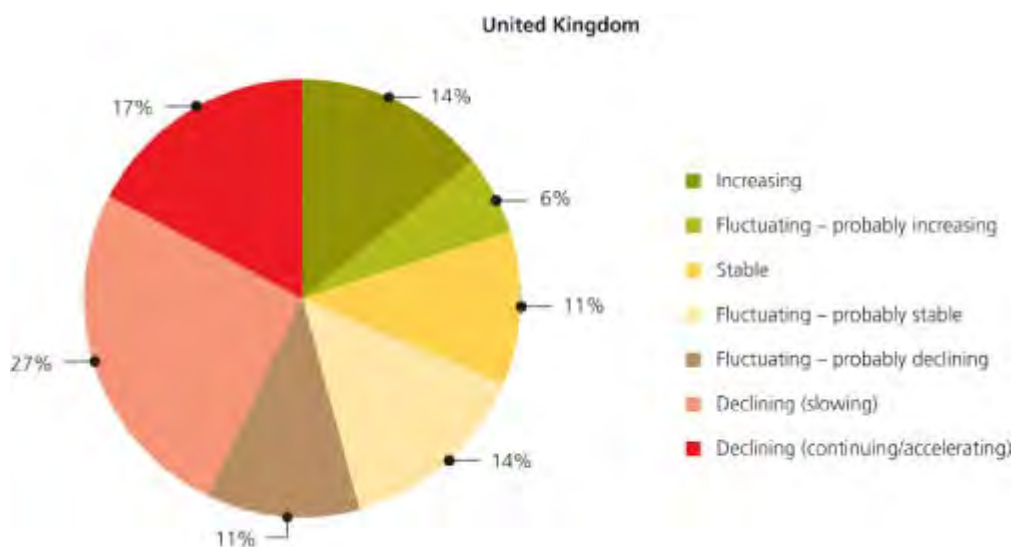
Assessment of change in status of Priority Habitats			
	Long term	**Since 1999**	**Latest year**
Priority Habitats that are stable or increasing	⊙	≈	N/A

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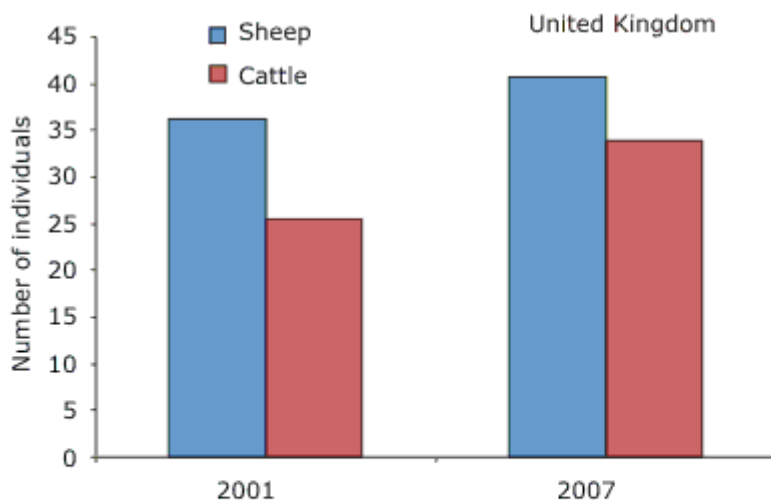
Notes: The 2001 values are based on assessments for 27 sheep and 18 cattle breeds. The 2007 values are based on assessments for 26 sheep and 20 cattle breeds. Breeds at greatest risk have the lowest effective population size and are a sub-set of the breeds assessed in each year.

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 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 2010
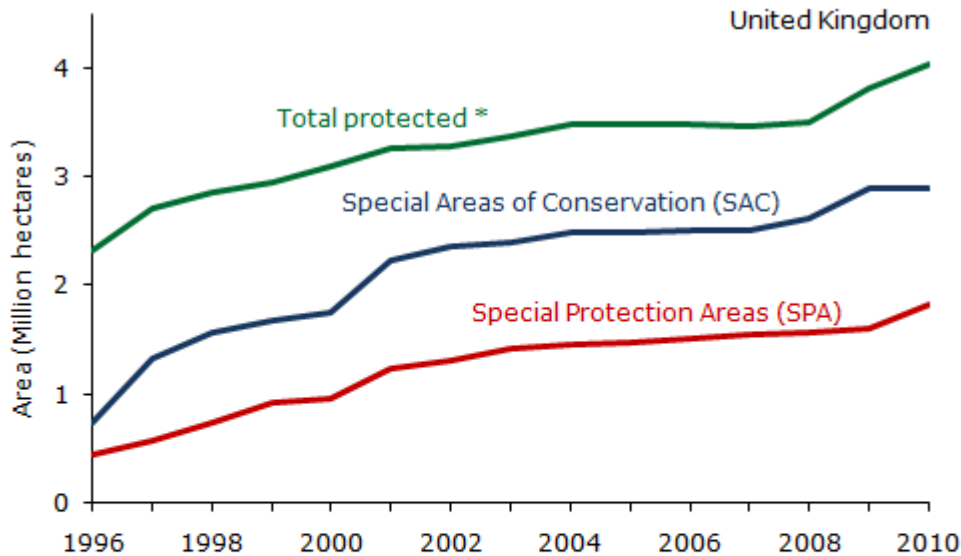
Notes: * Includes Areas / Sites of Special Scientific Interest (A/SSSI), SACs and SPAs. There is overlap between all categories of designation but each site contributes only once to the total area.

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

Cumulative proportion of protected areas in favourable or 'unfavourable recovering' condition, by feature or by area, 2005 to 2010
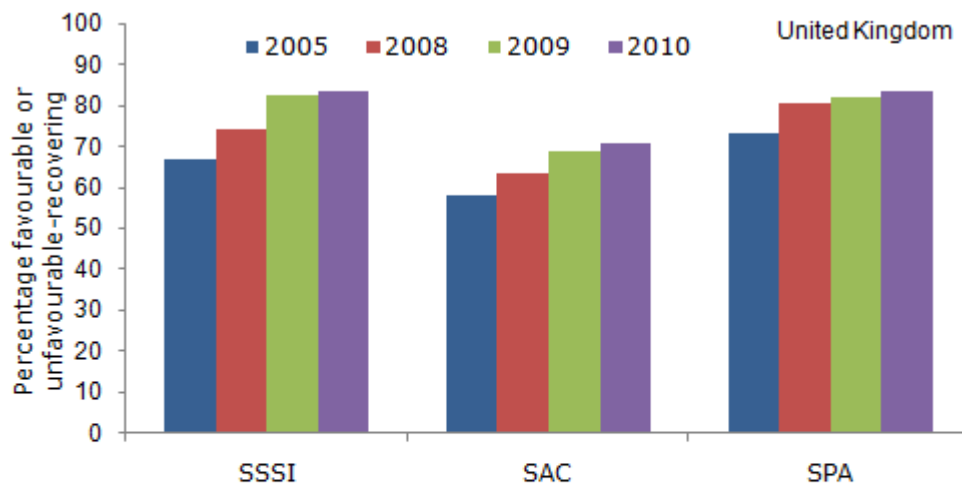
Notes: 1. SSSI columns excludes Wales.
2. England figures based on area, Scotland, Wales and Northern Ireland figures based on number of features.

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

Assessment of change in area and condition of UK protected areas			
	Long term	**Since 2000**	**Latest year**
Total extent of protected areas	✓ 1996-2010	✓	Increased (2010)
Condition of A/SSSIs	⋯	✓	Increased (2010)

- 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 4 million hectares between 1996 and 2010 – an increase of 74 per cent.

- Since 2000 there has been a 29 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 (recovering).

- Since 2005 the percentage of sites in favourable or recovering condition has increased by 17 per cent for A/SSSIs, 13 per cent for SACs and 10 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 2010
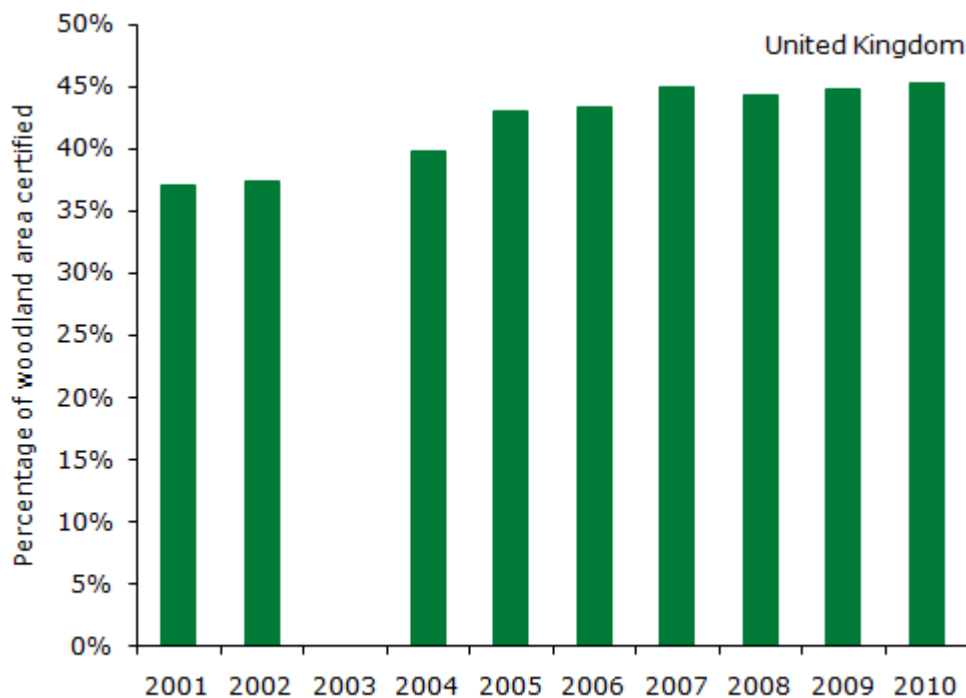
Source: Forestry Commission.

Assessment of change in area of sustainably managed woodland			
	Long term	**Since 2001**	**Latest year**
Percentage of woodland certified	⊙	✓	No change (2010)

- Certification of woodlands promotes responsible forest management to ensure that forests' 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 2010.

- Within the UK in 2010, the percentage of woodlands certified in England was 30 per cent, 44 per cent in Wales, 56 per cent in Scotland and 73 per cent in Northern Ireland.

8. Agri-environment scheme management

Area of land covered by higher level or targeted agri-environment schemes, 1992 to 2010
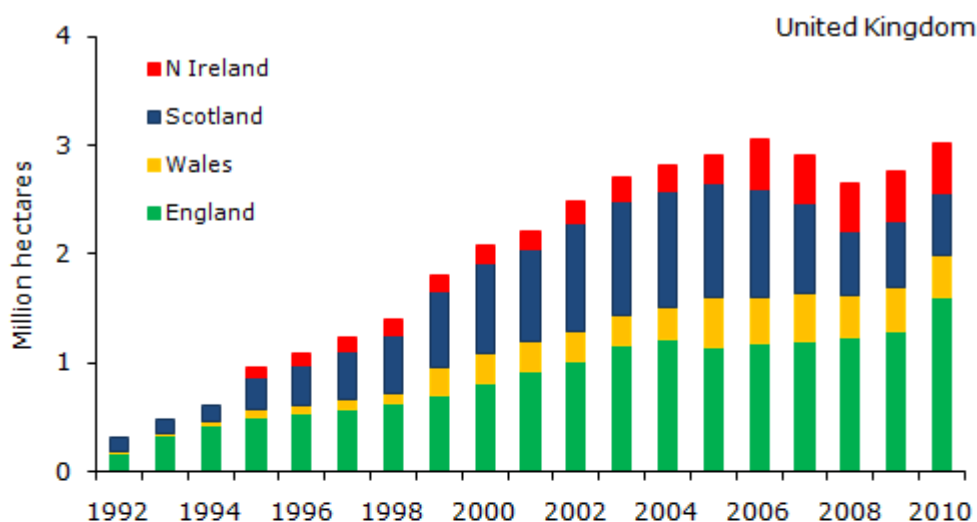
Source: Welsh Assembly Government, Countryside Council for Wales, Scottish Government, Natural England, Department for Agriculture and Rural Development Northern Ireland, Defra.

Notes:

1. The following schemes have been included here as higher level or targeted agri-environment schemes:

England: Environment Sensitive Areas (ESA), Countryside Stewardship (CS), and Higher Level Stewardship (HLS).

Scotland: ESA, Countryside Premium, and Rural Stewardship (HLS), Rural Priorities (RP).

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 2010 are provisional.

Assessment of change in area of land covered by agri-environment schemes			
	Long term	**Since 2000**	**Latest year**
Higher level, targeted agri-environment schemes	✓ 1992-2010	✓	Increased (2010)
Entry-type whole farm schemes	⊙	✓	Decreased (2010)

Area of land covered by entry-level type, whole-farm agri-environment schemes, 2005 to 2010
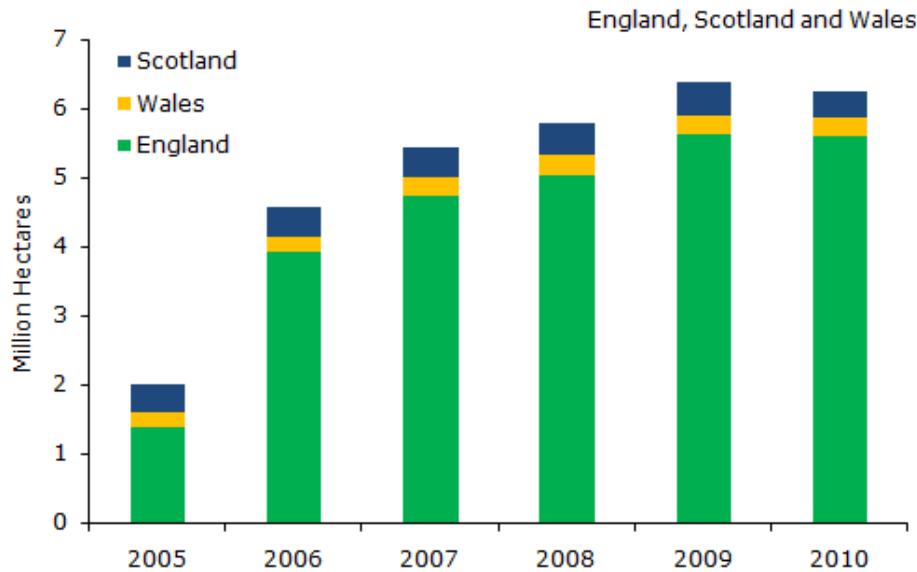
England, Scotland and Wales

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

Notes:
1. The following have been included here as entry level type schemes:
England: Entry Level Stewardship Scheme.
Scotland: Land Management Contracts (previously Menu Scheme),
                Land Managers, Options Schemes, Habitat Scheme.
Wales: Tir Cynnal.

2. Entry level 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 2010 are provisional.

- 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 aimed to: conserve wildlife; maintain and enhance landscape quality and character; protect the historic environment and natural resources, and to promote public access and understanding of the countryside.

- The entry level schemes aim to encourage large numbers of farmers, across all types of 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 2010 the total area of land in higher level or targeted agri-environment agreements in the UK was just over 3.0 million hectares. In the individual countries the proportion of agricultural land managed under high level schemes amounts to 18 per cent in England; 26 per cent in Wales; 10 per cent in Scotland and 46 per cent in Northern Ireland.

- In 2010 the total area of land in entry level schemes in England, Scotland and Wales was 6.2 million hectares. In the individual countries the proportion of agricultural land managed under entry level schemes amounts to 63 per cent in England; 19 per cent in Wales; and 7 per cent in Scotland.

- The majority of land on higher level schemes is also in an entry-level type scheme (except in Wales, where the two schemes do not overlap), therefore the total areas cannot be added together.

9. Sustainable fisheries

Percentage of fish stocks harvested sustainably and at full reproductive capacity, 1990 to 2009
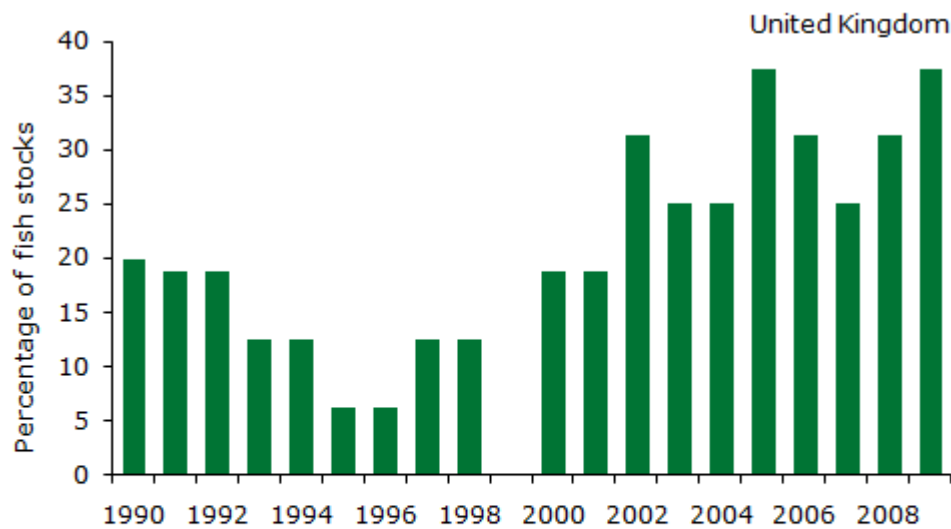
Notes: Based on 16 stocks for which accurate time series are available derived from stock assessment reports.

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	✅ 1990-2009	✅	Increased (2009)

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

- The percentage of the 16 fish stocks considered to be harvested sustainably and at full reproductive capacity varied between 0 per cent and 20 per cent in the 1990s, but has subsequently increased to between 25% and 38% during 2002 to 2009.

- Despite these increases, between 62 and 75 per cent of the indicator stocks have had reduced reproductive capacity and/or have been harvested unsustainably each year since 2002.

- For most of the stocks now considered to be fished sustainably, further reductions in fishing rates would improve the long-term yield.

- In 2009 the number of stocks included in the index reduced from 18 to 16, because for two stocks it was no longer possible to evaluate status. Exclusion of these two stocks, and changes to historical trends of the other stocks from updated assessments using data up to 2009, has shifted the value of the indicator downwards for all years since 1998, with the largest decreases observed in 2008 (down 19 per cent) and 2007 (down 14 per cent). This is mainly because the excluded stocks were previously included in the indicator and assessed as being fished sustainably in recent years.

23

10. Ecological impacts of air pollution

Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication, 1996 to 2007
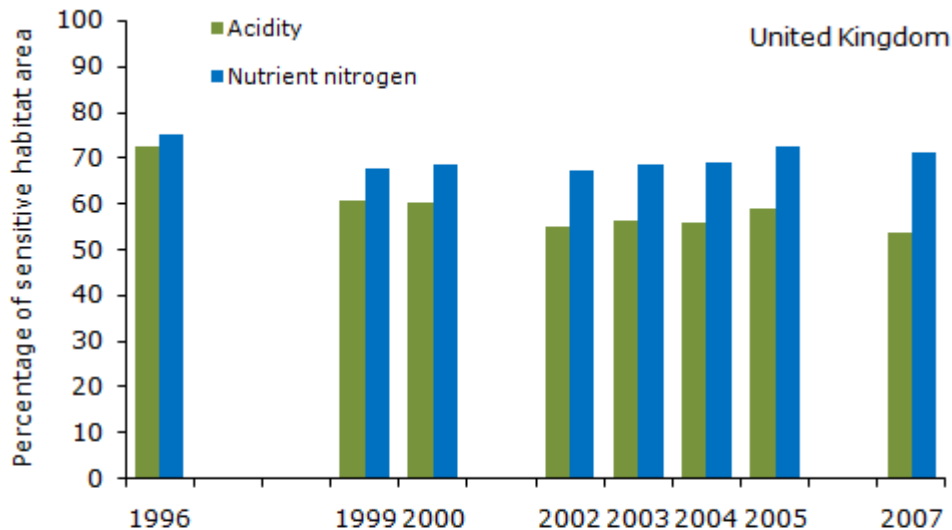
Notes: Since 2002 nitric acid has been included in the estimates of nitrogen deposition and since 2003 aerosol disposition of sulphate, nitrate and ammonium have also been included. This additional deposition led to some increases in critical load exceedance compared with earlier periods. Each bar represents a three-year average of deposition data 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	✓ 1996-2007	✓	N/A
Area affected by nitrogen	✓ 1996-2007	≈	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 arise mainly from burning fossil fuels and emissions from livestock waste. 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 of sensitive habitats where acid deposition exceeded critical loads was 73 per cent, declining to 54 per cent by 2007. The percentage area affected has also declined since 2000.

- In 2007, the percentage of sensitive habitats where nitrogen deposition exceeded critical loads was 71 per cent, down from 75 per cent in1996. The percentage area affected changed little between 2000 and 2007.

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
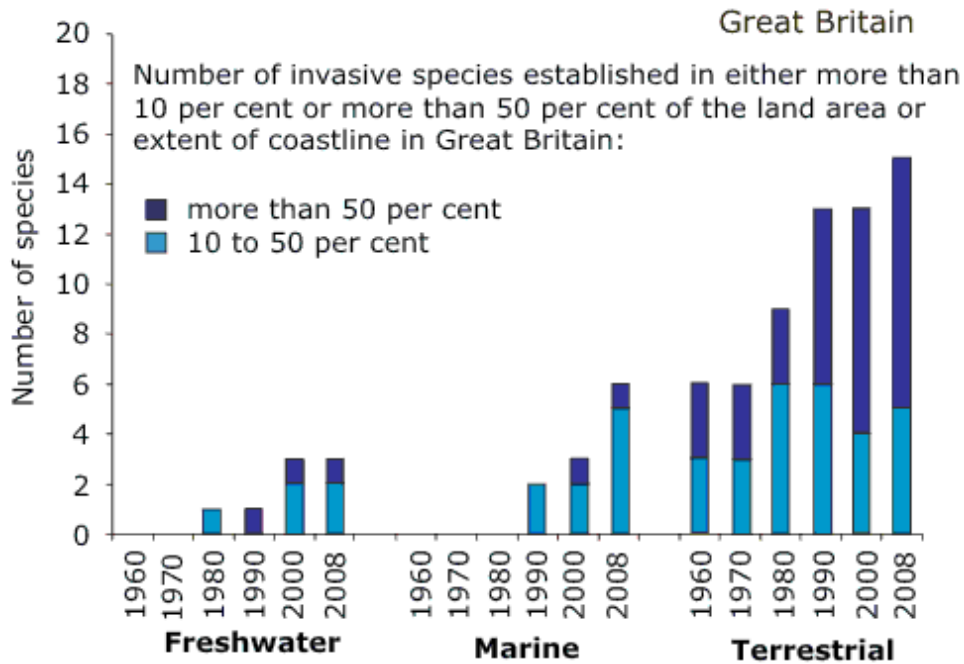
Source: Centre for Ecology and Hydrology, British Trust for Ornithology, Marine Biological Association and the National Biodiversity Network Gateway.

Proportion of non-native species in samples of birds, mammals, plants and marine organisms, 1990 to 2007
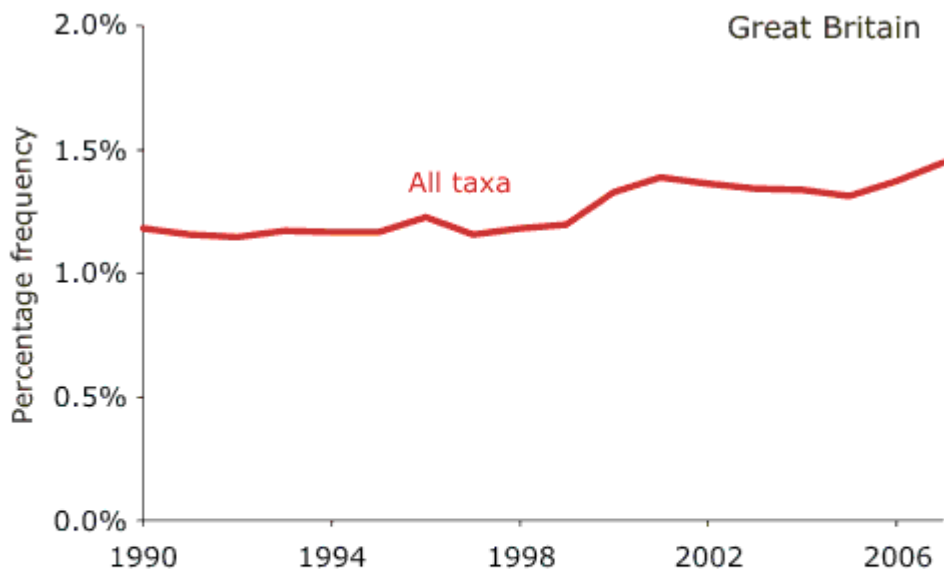
Source: Centre for Ecology and Hydrology, British Trust for Ornithology, Marine Biological Association and the National Biodiversity Network Gateway.

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

- 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 10 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 2010
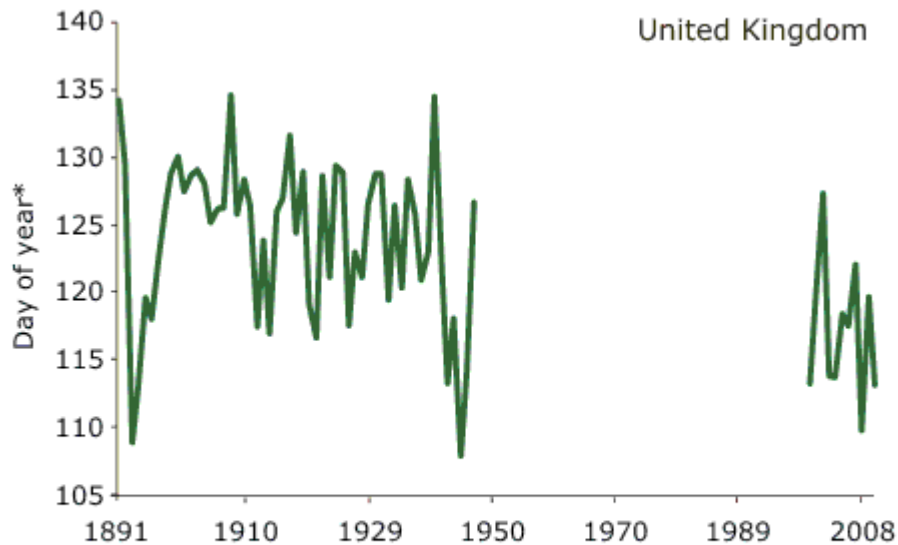
Notes: *Number of days after January 1st (e.g. day 121 = May 1st).

Source: UK Phenology Network.

- This is a contextual indicator that shows how changes in climate, particularly temperature, can be associated with changes in the timing of biological events.

- The UK Spring Index is calculated from the annual mean observation date of the following four biological events: first flowering of hawthorn (*Crataegus monogyna*), first flowering of horse chestnut (*Aesculus hippocastanum*), first recorded flight of the orange-tip butterfly (*Anthocharis cardamines*) and first sighting of a swallow (*Hirundo rustica*).

- The 1891-1947 data were mostly collected by the Royal Meteorological Society and the 1999-2010 data by the UK Phenology Network.

- While the indicator has fluctuated from year to year, on average spring events in the UK occurred earlier during the period 1999-2010 than they did during the period 1891-1947. The overall mean dates were 7 days earlier during the 1999-2010 period compared with the 1891-1947 period.

- These changes in the Spring Index are strongly linked to increases in the 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 2009
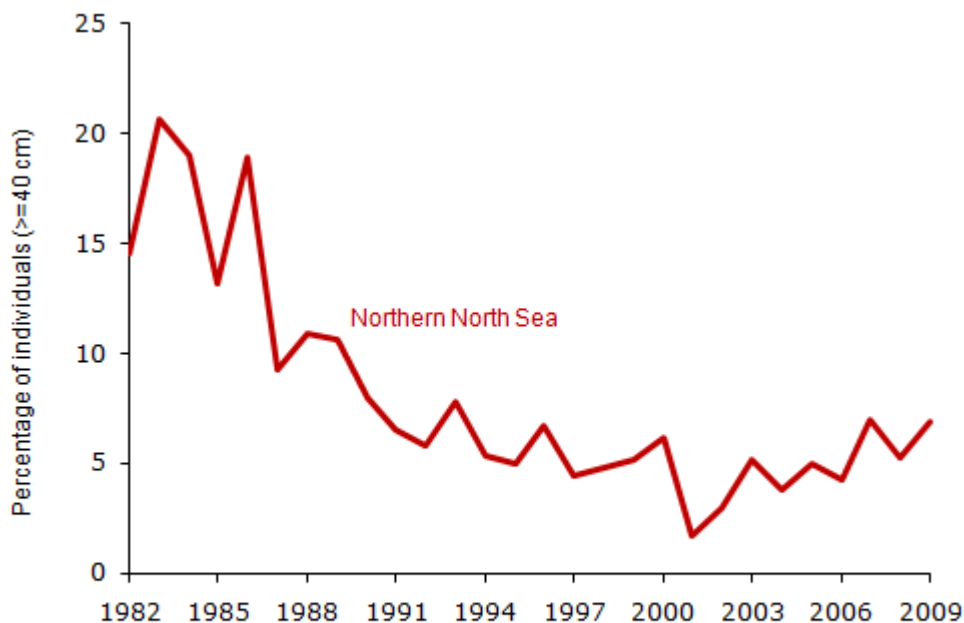
Source: Marine Scotland, Centre for Environment, Fisheries and Aquaculture Science.

Assessment of change in the proportion of large individuals in North Sea fish populations			
	Long term	**Since 2000**	**Latest year**
Northern North Sea	❌ 1982-2009	✅	Increased (2009)

Note: The assessment for 'Since 2000' is made by comparing a three year average for the baseline (1999 to 2001) with the latest data point (2009).

- 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.

- The proportion of large fish, in the Northern North Sea fell from around 15 per cent by weight of the fish community in 1982 to around seven per cent in 2009; however this is an increase from a low of two per cent in 2001. Large fluctuations in numbers between years are typical features of the size of North Sea fish populations.

- 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 a modest increase in recent years in other seas around the UK since 2000.

14. Habitat connectivity

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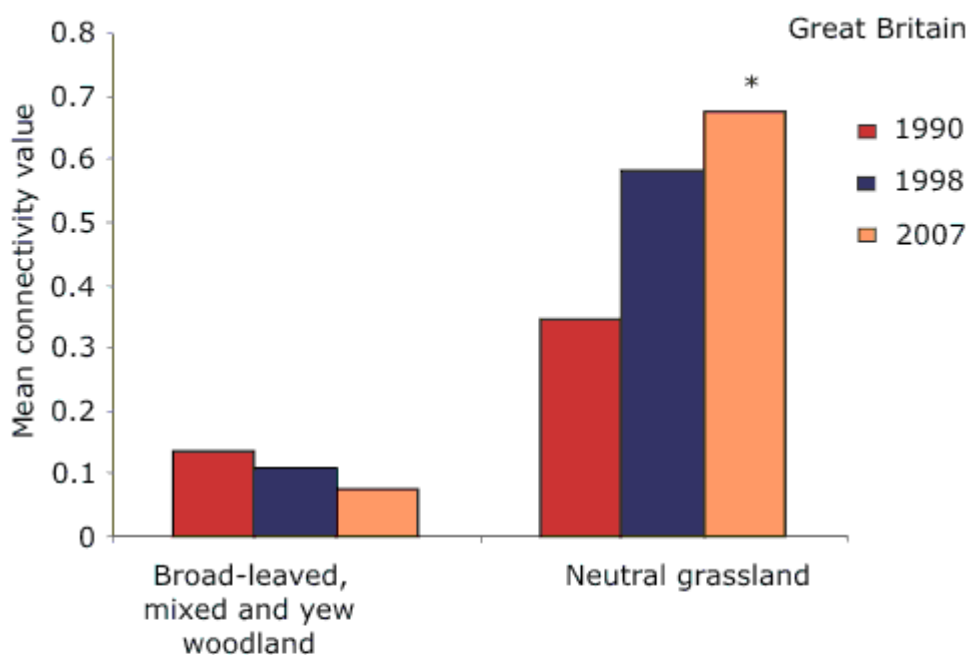
Notes: 1. The mean connectivity value is a measure of the relative connectivity on a scale of 0 to 100. Typical values are less than 1.

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 2000**	**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 2009
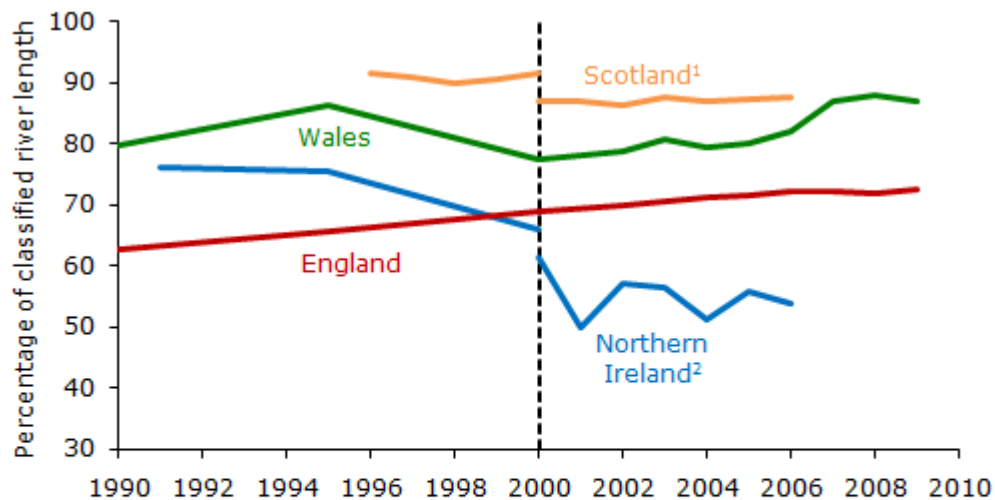
Notes: 1. Scottish river classification is based on a combined chemical, biological and aesthetic assessment and is not directly comparable with other countries. The Scottish classification network changed in 2000.
2. Northern Ireland network significantly expanded in 2000. 2000 figures are shown for 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	✓ 1990-2009	✓	No change (2009)

- In 2009, the percentage of river lengths with good biological quality in England was 73 per cent, up from 63 per cent in 1990 and 69 per cent in 2000. In Wales, 87 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 river lengths with good quality in 2006 was 88 per cent. Between 2000 and 2006, this figure was stable between 87 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 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, should therefore not be compared with results previously reported.

16. UK biodiversity expenditure

Public sector expenditure on biodiversity in the UK, 2000-1 to 2009-10
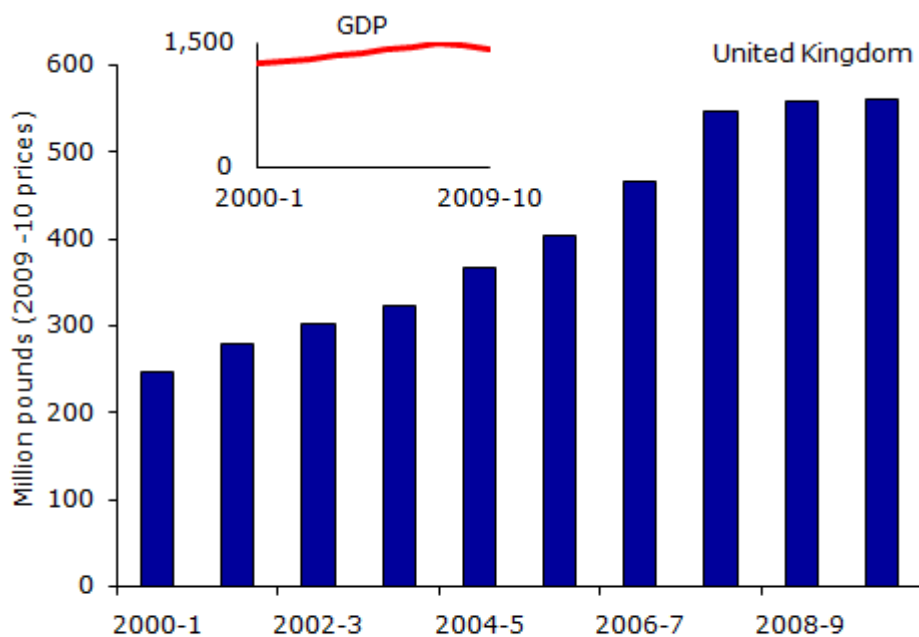
Notes: 1. Deflated using UK Gross Domestic Product deflator.
2. Inset chart shows UK Gross Domestic Product (billion pounds), 2000-1 to 2009-10.

Source: Defra.

Assessment of change in public expenditure on UK biodiversity			
	Long term	**Since 2000-1**	**Latest year**
UK biodiversity expenditure	⊙	✓	No change (2009-10)

- Spending is one way of assessing the priority that is given to biodiversity within Government.
- In 2009-10, £560 million pounds of public sector funding was spent on UK biodiversity.
- Since 2000-1 public sector spending on UK biodiversity has increased by 126 per cent. Over the same period GDP increased by 13 per cent.

17. Global biodiversity expenditure

UK Government funding for global biodiversity, 2000-1 to 2009-10
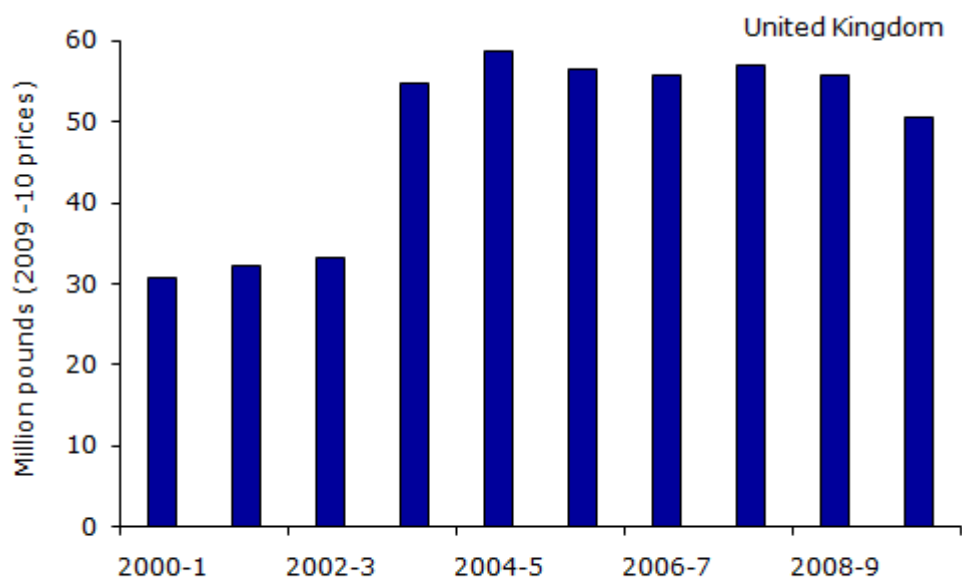
Notes: Deflated using UK Gross Domestic Product deflator.

Source: Defra.

Assessment of change in public expenditure on global biodiversity			
	Long term	**Since 2000-1**	**Latest year**
UK global biodiversity expenditure	⊙	✓	Decreased (2009-10)

- 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 2009-10, UK funding for global biodiversity totalled £51 million.

- Global spending by the UK public sector has increased by 65 per cent since 2000-1 in real terms. However, over the last 5 years spending has fallen slightly. During the same period UK GDP has grown by 13 per cent.

33

18. Conservation volunteering

Index of volunteer time spent in biodiversity conservation in selected UK conservation charities, 2000 to 2010
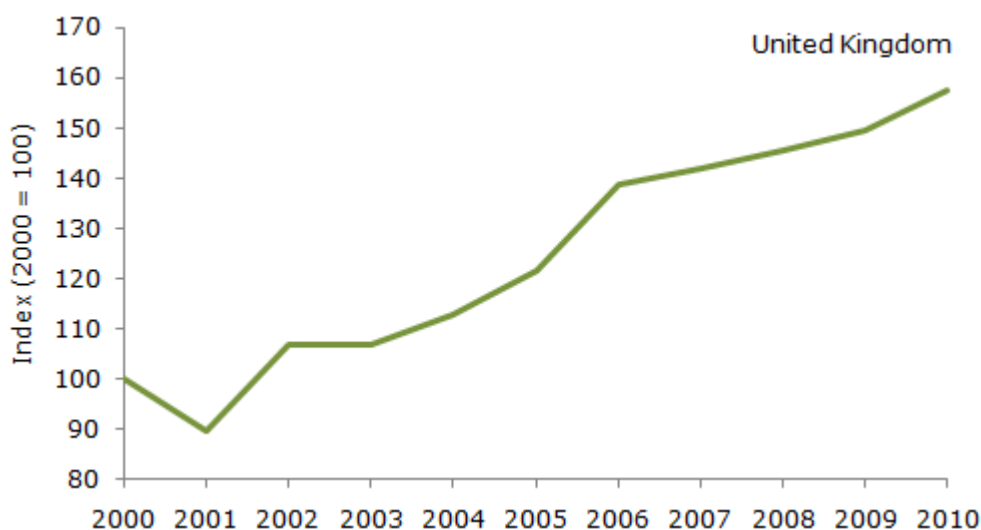
Notes:
1. Interpolated data have been used by Defra to impute for missing years.
2. As data provided by BTCV, Loch Lomond and The Trossachs National Park, Northumberland National Park, North Yorkshire Moors National Park, Peak District National Park, and RSPB were for financial years as opposed to calendar years, 2009-10 data were allocated to 2009 and Defra estimates were made for 2010.

Source:
Bat Conservation Trust, Botanical Society of the British Isles, British Waterways, British Trust for Conservation Volunteers, British Trust for Ornithology, Butterfly Conservation, Natural England, Exmoor National Park, Lake District National Park, Loch Lomond and The Trossachs National Park, North Yorkshire Moors National Park, Northumberland National Park, Peak District National Park, Plantlife, Royal Society for the Protection of Birds, Soil Association, the Wildlife Trusts, Woodland Trust.

Assessment of change in volunteer time spent in biodiversity conservation			
	Long term	**Since 2000**	**Latest year**
Conservation volunteering	⊙	✓	Increased (2010)

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

- Between 2000 and 2010 the amount of time contributed by volunteers increased by 65 per cent.

Enquiries about indicators or this publication

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, Karin Maatman and Pat Thomas.

JNCC: James Williams, Linda Birkin, Cherry-Ann Vickery, Emma Durham, Cathy Gardner, and Ulric Wilson.

Steering Group members: Sarah Webster (Defra), Karen Haysom and Richard Gregory (Wildlife and Countryside Link), Keith Porter (Natural England), Richard Weyl (Northern Ireland Environment Agency), Ed Mackey (Scottish Natural Heritage), David Allen (Countryside Council for Wales), Caryn Le Roux (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.

Information on other environmental statistics is also available on Defra's webpages at http://www.defra.gov.uk/statistics/environment/biodiversity/.

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, 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.defra.gov.uk/biyp.