

# UK Biodiversity Indicators in Your Pocket 2013



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# UK Biodiversity Indicators in Your Pocket 2013

Measuring progress towards halting biodiversity loss



Department  
for Environment  
Food & Rural Affairs



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## Introduction

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### UK Biodiversity Indicators 2013

Biodiversity is the variety of all life on Earth. It includes all species of animals and plants, and the natural systems that support them. Biodiversity matters because it supports the vital benefits we get from the natural environment. It contributes to our economy, our health and wellbeing, and it enriches our lives.

The UK is a signatory to the Convention on Biological Diversity (CBD) and is committed to the new biodiversity goals and targets 'the Aichi targets' agreed in 2010 and set out in the [Strategic Plan for Biodiversity 2011-2020](#). We are also committed to developing and using a set of indicators to report on progress towards meeting these international goals and targets. There are related commitments on biodiversity made by the European Union, and the UK indicators may also be used to assess progress with these.

The UK indicators were comprehensively reviewed during 2011 and 2012 to ensure they continue to be based on the most robust and reliable available data; and remain relevant to the new international goals and targets<sup>1</sup>. Where previous indicators remain relevant and robust, they have been retained. A number of refinements to existing indicators were identified to improve their relevance, make them easier to understand, or to address concerns over data quality or availability. Where there were no indicators for particular targets, or where the existing indicators were only indirectly linked to the Aichi targets, new indicators were identified. The first set of revised UK indicators was published in May 2012. In this version of the publication each of the indicators has been updated with the most recent data wherever possible. In some cases, however, development work is ongoing, and where this is the case, the work to develop them over the next two to three years has been described briefly.

Indicators are useful tools for summarising and communicating broad trends. They are not intended to incorporate all the relevant information available in the UK. They are best seen, as their name suggests, as indicative of wider changes. The UK biodiversity indicators will form a major part of the UK's 5<sup>th</sup> National Report to the CBD in 2014 but will be supplemented with other information relating to UK biodiversity and implementation of the Strategic Plan for Biodiversity 2011-2020.

Biodiversity policy is a devolved responsibility in the UK; England, Scotland, Wales and Northern Ireland have each developed or are developing their own biodiversity or environment strategies. Indicators are being developed to track progress with the respective commitments in each country. The UK indicators have a specific purpose for international reporting and were selected following consultation and agreement between the administrations. The indicators provide a flexible framework and a common set of methodologies which in some cases can also be used for country reporting.

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

The indicators may be subject to further review, particularly as the reporting requirements of the EU Biodiversity Strategy and the EU Marine Strategy Framework Directive are clarified.

Previous versions of the indicators are available for download at [www.jncc.defra.gov.uk/biyp](http://www.jncc.defra.gov.uk/biyp). Links to the full detail of each of the previous editions are provided on the website (stored on the National Archives website).





This is a Defra National Statistics compendium (see Annex for further details).

1. This review involved wide consultation with the UK [Biodiversity Indicator Forum](#) involving key stakeholders.

## Assessing indicators

Each indicator is composed of one or more measures that show trends over time. Many indicators have a single measure, but where data cannot be combined logically, the indicator will have more than one measure. Each measure is summarised or 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

Where possible the assessment has been made by evaluating trends using statistical analysis techniques. The assessment may be made by Defra statisticians in collaboration with the data providers, or undertaken by the data providers themselves. 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 some indicators, it is not possible to formally determine statistical significance and in such cases 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 'rule of thumb' threshold. The standard threshold used is three per cent, unless noted otherwise. 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; use of this approach is kept under review.

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:

- Long-term – an assessment of change since the earliest date for which data are available, although if the data run is for less than ten years a long-term assessment is not made.
- Short-term – an assessment of change over the latest five years<sup>2</sup>.

For both long term and short term assessments the years over which the assessment is undertaken is stated in the assessment table. 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.

2. For a very few indicators the short term change is over a longer time period as a result of the frequency of update of the data upon which the indicators are based. Thus indicators B6, C2 and C7 have a ten year short term assessment, and C3 has a six year short term assessment.

## Overview of assessment of change for all indicators

The table below summarises traffic light assessments for the 25 indicators and their component measures.

Indicator number (Strategic Goal / number), title, and measures where applicable			Long-term change <sup>3</sup>	Short-term change <sup>4</sup>
A1. Awareness, understanding and support for conservation			Under development, no interim measure(s) available	
A2. Taking action for nature: volunteer time spent in conservation			🟢 2000–2012	🔴 2007–2012
A3. Value of biodiversity integrated into decision making			Under development, no interim measure(s) available	
A4. Global biodiversity impacts of UK economic activity / sustainable consumption			Under development, no interim measure(s) available	
A5. Integration of biodiversity considerations into business activity			Under development, no interim measure(s) available	
B1. Agricultural and forest area under environmental management schemes	B1a. Area of land in agri-environment schemes	B1a(i). Higher-level / targeted schemes	🟢 1992–2012	🟢 2007–2012
		B1a(ii). Entry-level type schemes	⚪	🟢 2007–2012
	B1b. Area of forestry land certified as sustainably managed		🟢 2001–2013	🟡 2008–2013
B2. Sustainable fisheries			🟢 1990–2011	🟢 2006–2011
B3. Climate change adaptation			Under development, no interim measure(s) available	
B4. Pressure from climate change			Not assessed	Not assessed
B5. Pressure from pollution	B5a. Air pollution	B5a(i). Area affected by acidity	🟢 1996–2010	🟢 2005–2010
		B5a(ii). Area affected by nitrogen	🟢 1996–2010	🟢 2005–2010
	B5b. Marine pollution		🟢 1990–2011	🟢 2006–2011
B6. Pressure from invasive species	B6a. Freshwater invasive species		🔴 1960–2008	🟡 2000–2008
	B6b. Marine invasive species		🔴 1960–2008	🔴 2000–2008
	B6c. Terrestrial invasive species		🔴 1960–2008	🔴 2000–2008
B7. Water quality			Not Assessed	Not Assessed
C1. Protected areas	C1a. Total area of protected areas: on-land		🟢 1950–2013	🟢 2008–2013
	C1b. Total area of protected areas: at-sea		🟢 1950–2013	🟢 2008–2013

Indicator number (Strategic Goal / number), title, and measures where applicable			Long-term change <sup>3</sup>	Short-term change <sup>4</sup>
	C1c. Condition of A/SSSIs		⊕⊕⊕	✔ 2008–2012/13
C2. Habitat connectivity	C2a. Broad-leaved, mixed and yew woodland		⊕⊕⊕	⊕⊕⊕
	C2b. Neutral grassland		⊕⊕⊕	⊕⊕⊕
C3. Status of habitats of European importance			⊕⊕⊕	✖ 2007–2013
C4. Status of threatened species	C4a. Status of priority species		✖ 1970–2010	✖ 2005–2010
	C4b. Status of species of European importance		⊕⊕⊕	✔ 2007–2013
C5. Birds of the wider countryside and at sea	C5a. Farmland birds		✖ 1970–2011	✖ 2006–2011
	C5b. Woodland birds		✖ 1970–2011	✔ 2006–2011
	C5c. Wetland birds		✖ 1975–2011	✖ 2006–2011
	C5d. Seabirds		✔ 1970–2012	✖ 2007–2012
	C5e. Wintering waterbirds		✔ 1975/6 – 2010/11	⚡ 2005/6 – 2010/11
C6. Insects of the wider countryside (butterflies)	C6a. Semi-natural habitat specialists		✖ 1976–2012	⚡ 2007–2012
	C6b. Species of the wider countryside		⚡ 1976–2012	⚡ 2007–2012
C7. Plants of the wider countryside	C7a. Change in plant species richness (arable and horticultural land)		✔ 1990–2007	✔ 1998–2007
	C7b. Change in plant species richness (woodland and grassland)		✖ 1990–2007	✖ 1998–2007
	C7c. Change in plant species richness (boundary habitats)		✖ 1990–2007	✖ 1998–2007
C8. Mammals of the wider countryside (bats)	C8a. Bat populations		✔ 1999–2012	⚡ 2007–2012
	C8b. Historical pipistrelle bat roost counts <sup>5</sup>		✖ 1977–1999	Not Assessed
C9. Genetic resources for food and agriculture	C9a. Animal genetic resources	C9a(i). Native sheep breeds	⊕⊕⊕	⚡ 2001–2007
		C9a(ii). Native cattle breeds	⊕⊕⊕	✔ 2001–2007
	C9b. Plant genetic resources - Enrichment Index		✔ 1960–2012	✔ 2007–2012
D1. Biodiversity and ecosystem services (marine – fish size classes in the North Sea)			✖ 1983–2011	✔ 2006–2011
D2. Biodiversity and ecosystem services (terrestrial)			Under development, no interim	



Indicator number (Strategic Goal / number), title, and measures where applicable		Long-term change <sup>3</sup>	Short-term change <sup>4</sup>
		measure(s) available	
E1. Biodiversity data for decision making		Under development, no interim measure(s) available	
E2. Expenditure on UK and international biodiversity	E2a. Expenditure on UK biodiversity	✓ 2000/1 – 2012/13	✗ 2007/8 – 2012/13
	E2b. UK Expenditure on international biodiversity	✓ 2000/1 – 2012/13	✗ 2007/8 – 2012/13

3. Long-term – an assessment of change since the earliest date for which data are available, although if the data run is for less than ten years a long-term assessment is not made.

4. Short-term – an assessment of change over the latest five years. For a very few indicators the short term change is over a longer time period as a result of the frequency of update of the data upon which the indicators are based. Thus indicators B6, C2 and C7 have a ten year short term assessment, and C3 and C4b have a six year short term assessment.

5. Historical pipistrelle bat roost counts are not included in the summary of all measures chart as it will never be possible to make a short term assessment on this measure, and also because there is no possibility for the measure to change from a decline to an increase.

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

The 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).

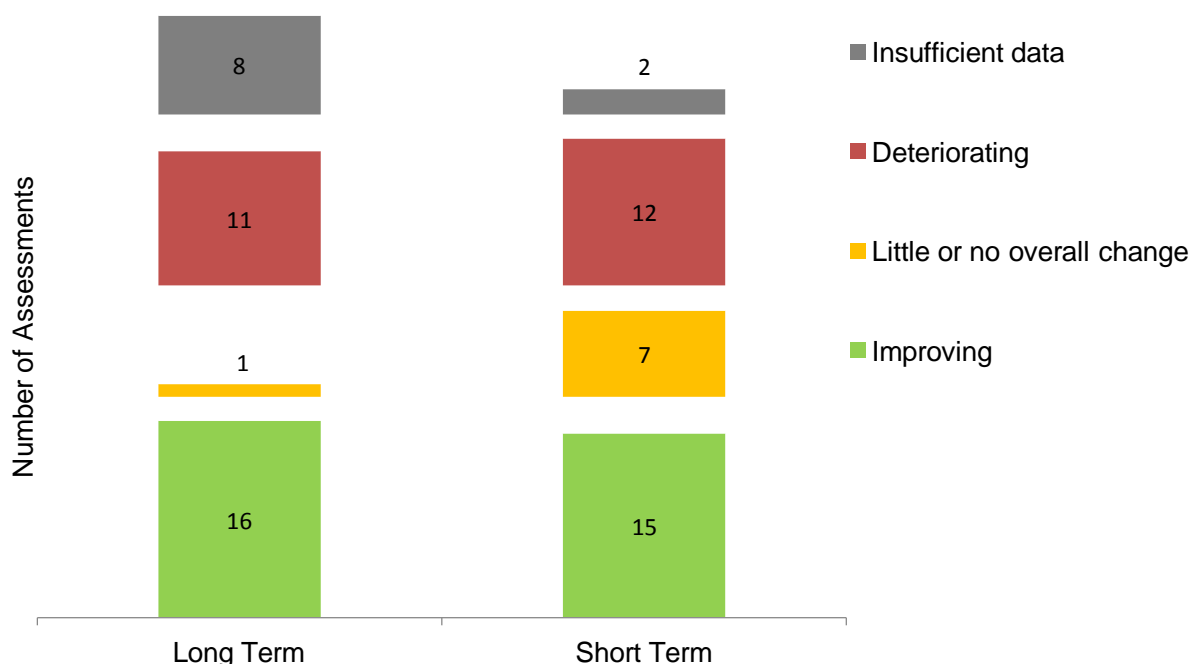
The UK Government is a signatory to the Convention on Biological Diversity (CBD) and is committed to the new biodiversity goals and targets agreed in 2010 and set out in the [Strategic Plan for Biodiversity 2011–2020](#)<sup>6</sup>. The Strategic Plan has five goals, each with a number of targets (the focus of each goal is shown by the words in bold type below):

- A. Address the underlying causes of biodiversity loss by **mainstreaming** biodiversity across government and society.
- B. Reduce the direct **pressures** on biodiversity and promote sustainable use.
- C. Improve the **status** of biodiversity by safeguarding ecosystems, species and genetic diversity.
- D. Enhance the **benefits** to all from biodiversity and ecosystems.
- E. Enhance **implementation** through planning, knowledge management and capacity building.

As well as overall summaries based on all measures in the indicators, separate summaries for Strategic Goals B and C are shown, which are based on the indicators and measures linked to those goals (B1 to B7; C1 to C9). A number of indicators are under development for Strategic Goals A, D, and E, so they currently have very few measures – separate charts are therefore not shown.

<sup>6</sup> The targets are known as 'Aichi Targets', after the province in Japan where they were agreed.

## Assessment of change: all measures



Of the 36 measures used to compile the 'all measures' summary chart, 15 (42 per cent) show a short term improvement, compared with 16 measures (44 per cent) showing improvement over the longer term. 12 measures (33 per cent) show a decline in the short term, and 11 (31 per cent) a decline in the long term.

Those showing an improvement in the short term include: the area of land in agri-environment schemes, sustainable fisheries, air and marine pollution, the extent of protected sites both on-land and at-sea, condition of sites of special scientific interest, status of species of European importance, woodland birds, and plant genetic resources.

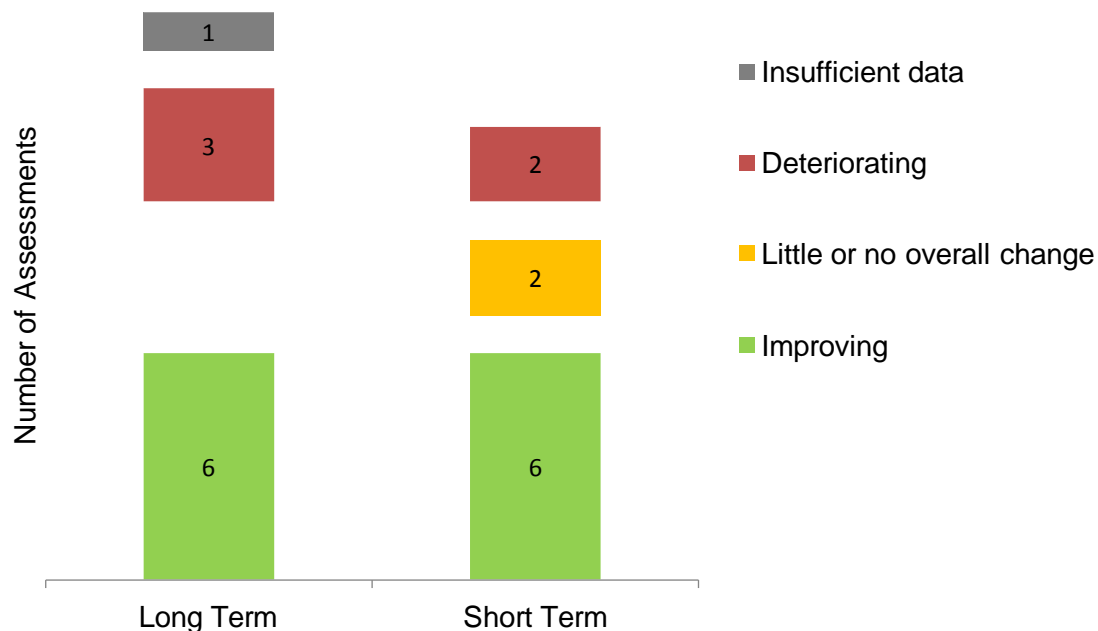
Measures which have improved in the long term include: conservation volunteering, sustainable fisheries, air and marine pollution, the extent of protected sites both on-land and at-sea, populations of seabirds and of wintering water birds, plant species richness of arable and horticultural land, plant genetic resources and expenditure on UK and international biodiversity.

Measures showing long-term deterioration include: prevalence of terrestrial, freshwater and marine invasive species, status of priority species, populations of farmland, woodland and wetland birds, populations of butterflies which are strongly associated with semi-natural habitats, 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. marine and terrestrial invasive species, priority species, populations of farmland and wetland birds, and the plant diversity of boundary habitats).

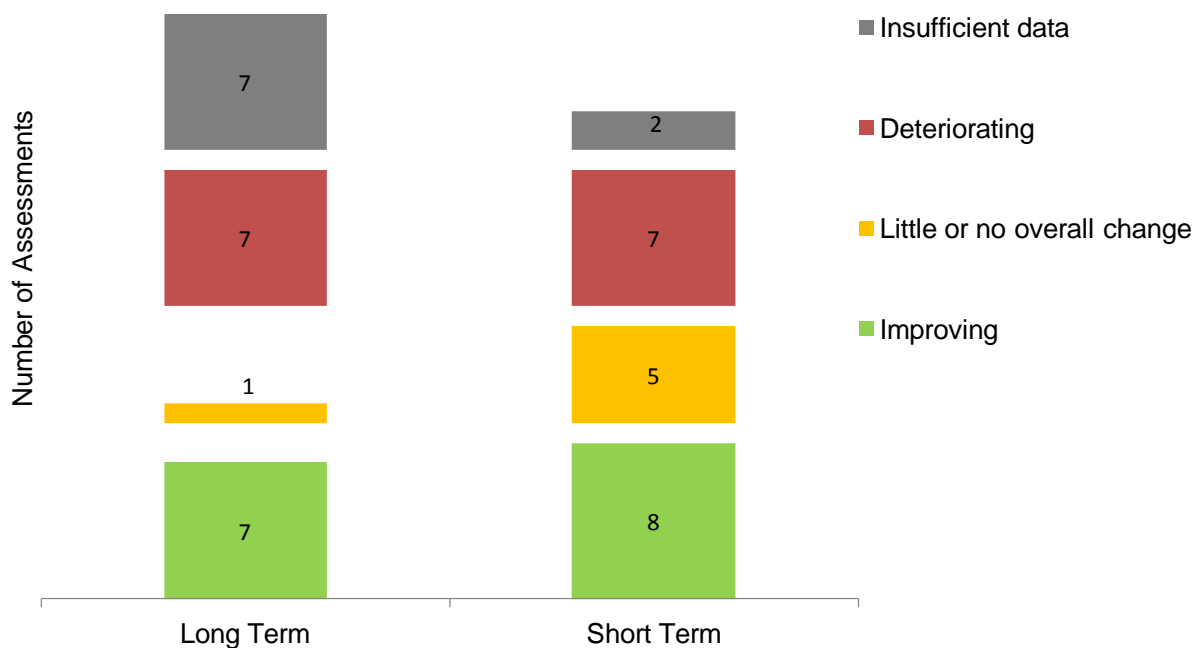
## Assessment of change: Strategic Goals B and C

### Goal B: Reduce the direct pressures on biodiversity and promote sustainable use.



The indicators under Strategic Goal B (seven indicators and ten measures prefixed 'B' in the summary table) show progress is being made to address the pressures on biodiversity (e.g. in the proportion of fisheries that are sustainable, in the area of land in agri-environment schemes, and air and marine pollution). There is both long- and short-term deterioration for prevalence of marine and terrestrial invasive species, reflecting a pattern of continuing or growing threat to biodiversity in the UK.

### Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.



There were long-term declines for seven measures (32 per cent) under Strategic Goal C (nine indicators and 22 measures prefixed 'C' in the summary table, covering status of biodiversity), reflecting the declines in many species populations seen in the 1970s and 1980s. In the short

term, these long-term declines have generally slowed, with some measures previously assessed as deteriorating showing either improvement (e.g. populations of woodland birds) or little or no overall change (e.g. butterflies, and wintering water birds). These conclusions should be viewed with some caution as changes are more difficult to assess over the short term. One measure within Strategic Goal C, seabirds, shows a long-term improvement, but deterioration in the short term.

## A1. Awareness, understanding and support for conservation

### Indicator under development – progress to date

Public understanding and opinion on the value of biodiversity has strong implications for the acceptance and adoption of conservation measures. Indicator A2 on conservation volunteering shows that many people are already very supportive of conservation efforts and make an important contribution. People value the natural world in different ways and for different reasons. They may simply value it for its own sake, because it makes our local environment more attractive, or because they enjoy experiencing nature-rich green places for recreation. Regular opportunities to experience the natural world are known to have positive impacts on our health.

The process of indicator development started by compiling a preliminary list of potential datasets and indicators for biodiversity awareness from the UK National Ecosystem Assessment (UK NEA, 2011a) and suggestions from an online survey of UK specialists in raising awareness of biodiversity values and identifying actions to enhance biodiversity conservation. UK experts in these fields then met at a workshop convened by the UNEP World Conservation Monitoring Centre (UNEP-WCMC), during which the preliminary list of indicators was refined and further indicators were suggested and considered for development.

The quality of each potential indicator was evaluated against specified criteria. Based on this process, three indicator options were short-listed for development; these options were reviewed through the [7<sup>th</sup> UK Biodiversity Indicators Forum](#), which considered the relative merits of measures about

- Awareness – the proportion of people who are aware of the term biodiversity and its meaning, although it is recognised that it is important to assess people's awareness of the threats to biodiversity now and in the future rather than their understanding of the meaning of the term 'biodiversity' itself;
- Connection / Concern – the proportion of people who feel connected to the biodiversity within their environment or are concerned about biodiversity loss;
- Behaviour / Response – the proportion of people that are taking action to support and protect biodiversity in a number of ways.

It was agreed that the most appropriate area for development was connection/concern, because it could be considered to partly include the other measures (it was thought that people would be unlikely to feel connection/concern without awareness; and if people feel connection/concern then they may be prepared to do something about it – i.e. it could lead to a behaviour/responses). However, it was felt that none of the indicator options alone fully captured all elements of Target 1 and so a robust approach should include some assessment in each of these three areas.

It was noted that Defra published, in May 2013, a research report titled [Engaging people in biodiversity issues](#). In this study a tier system was defined that resulted in a set of evidence-based criteria and decision rules that could be used to assign people from the general population into five discrete groups, based on their responses to a survey developed as part of the study. The tier system reflects different levels of awareness of and engagement in biodiversity issues. The tier definitions developed gave internally consistent findings in terms of attitudes and behaviours, and tiers were of sufficient size to allow further analysis and policy targeting. This study was therefore

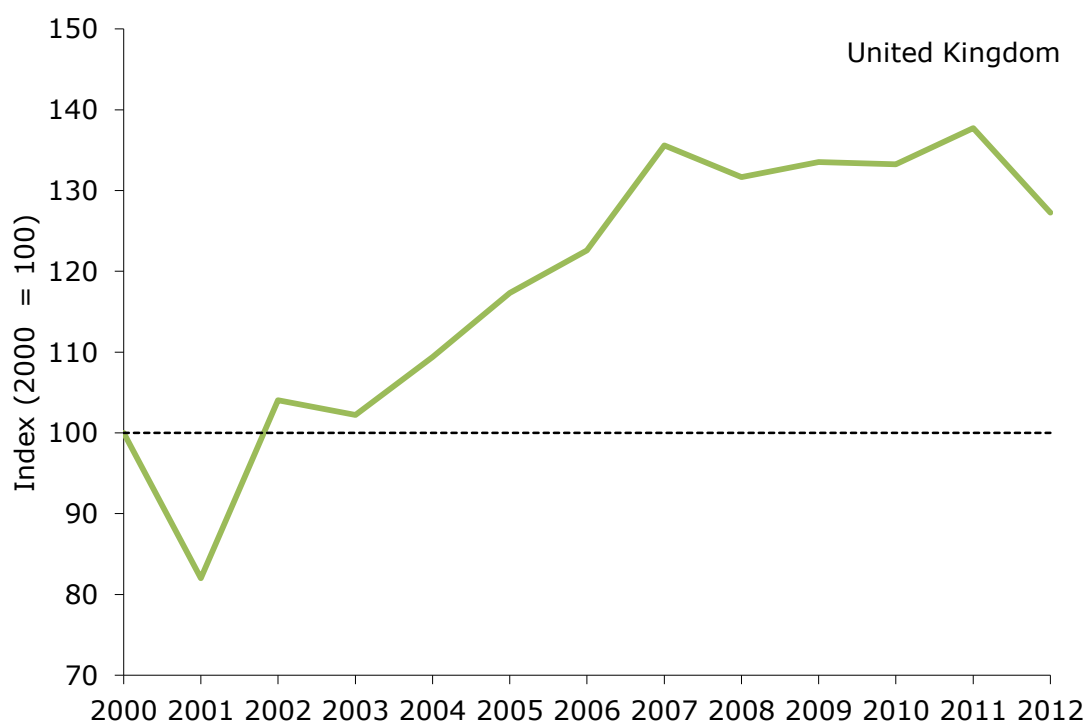
felt to provide a good foundation for specific indicators across the three areas identified above as it captured all parts of the awareness, concern and action spectrum.

At the subsequent UK Biodiversity Indicators Steering Group meeting in July 2013, it was agreed that the Biodiversity Evidence Team in Defra would work with country contacts to develop questions on awareness of, concern for and actions taken to prevent biodiversity loss, ideally based on questions in the Defra *Engaging people in biodiversity issues* report, which could be inserted into country surveys which are already running. This work is on-going, and it is hoped that a new indicator can be published in 2014. It is likely that the surveys used to provide the required information for this indicator will not be run every year, so the indicator will not be updated on an annual basis.

## A2. Taking action for nature: volunteer time spent in conservation

**Type:** Response Indicator

**Figure A2i.** Index of volunteer time spent in selected UK conservation organisations, 2000 to 2012.



### Notes:

1. The index is calculated using a non-weighted aggregation across organisations. It is therefore strongly dependent on the trends reported by the organisations recording large amounts for total volunteer hours, and furthermore strongly dependent on which organisations are included.
2. Interpolated estimates (based on assuming trends reported by other organisations can be applied) have been used to fill missing years for British Waterways (2000 to 2009), Butterfly Conservation (2000 to 2002), The Conservation Volunteers (2000 to 2005), Loch Lomond and The Trossachs National Park Authority (2000 to 2001, 2003), National Parks England (2000-2008), Natural England (2000, 2002), Plantlife (2000 to 2006), The Wildlife Trusts (2000 to 2005, 2010) and the Woodland Trust (2000 to 2001).
3. Data provided by the The Conservation Volunteers, Loch Lomond and The Trossachs National Park Authority, Natural England, British Waterways, England National Parks



and RSPB were for financial years rather than calendar years. Financial year data has been assigned to the first calendar year (e.g. 2011-12 data were allocated to 2011).

**Source:** Bat Conservation Trust, Botanical Society of the British Isles, The Conservation Volunteers, British Trust for Ornithology, British Waterways, Butterfly Conservation, Loch Lomond and The Trossachs National Park Authority, Natural England, England National Parks, Plantlife, RSPB, The Wildlife Trusts, Woodland Trust.

Assessment of change in volunteer time spent in conservation			
	Long term	Short term	Latest year
Conservation volunteering	 2000–2012	 2007–2012	Decreased (2012)

- 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 2012 the amount of time contributed by volunteers has increased by 27 per cent but in the five years to 2012 it decreased by six per cent.
- Owing to a need to impute missing values for organisations that did not provide data for all years, the data series has been revised since the last publication in 2012.

### A3. Value of biodiversity integrated into decision making

#### Indicator under development – progress to date

Integrating the value of biodiversity use as part of mainstream decision making is important to allow us to continue to enjoy the benefits from biodiversity that we currently achieve. Potential means of measuring this will be dependent on a number of factors including the extent to which systems of payments for ecosystems services are implemented, and developments in the incorporation of biodiversity values and other forms of natural capital into national accounting systems.

Aichi Target 2 is focussed on mainstreaming biodiversity into national and local level decision making processes. Indicator A3 could focus on a number of areas including the extent of schemes involving payments for ecosystem services and progress in developing ecosystems accounts within the national accounting framework.

### A4. Global biodiversity impacts of UK economic activity / sustainable consumption

#### Indicator under development – progress to date

Production and consumption in the UK has an impact on the natural environment beyond our shores through the range of imports and exports of goods and services. Each of the countries of the UK has introduced or is introducing policies to promote sustainable production and consumption and thereby reduce our impact on biodiversity and promote sustainable use of natural resources. The UK is heavily reliant on imported goods and services to satisfy demand. This demand, combined with recent and continued liberalisation of global trade, has resulted in a complex network of supply chains that cause pressure on biodiversity and ecosystems (beyond the UK's borders).

Research has been undertaken to assess how patterns of UK consumption impact on the key drivers of biodiversity change overseas and identify options for mitigating those impact. This includes:

- analysis and modelling of trade pathways and supply chains for goods and services to identify important sources of production; and
- identification of the potential impact of key production systems and products on biodiversity.

An assessment framework has been developed to provide information on the direct and indirect links between consumption in the UK and environmental impacts that occur due to production in other countries. A global trade model that retains product-level production detail and quantitative links to associated environmental impacts has been developed to allow top-down assessment of potential impacts. This model facilitates the selection of priority commodities and regions which can then be investigated in more detail using a case-study approach. The model developed in the project has clear potential for policy applications, however it does not automatically generate a robust indicator and options for further work need to be assessed.

## **A5. Integration of biodiversity considerations into business activity**

### **Indicator under development – progress to date**

Production and consumption in the UK has an impact within the UK as well as overseas, and so this indicator will complement [indicator A4](#) on global impacts of UK economic activity. Decisions made by businesses of any size within key sectors such as agriculture, forestry, industry, housing and infrastructure development, water supply and fisheries can have significant biodiversity impacts. Whilst information on how biodiversity considerations have been integrated into agriculture, forestry and fishery sectors is included in other UK indicators, there are clearly other sectors that are not adequately covered.

Following on from work undertaken by UNEP-WCMC under contract to Defra, which identified 11 datasets that could potentially be used for this indicator, industry experts were consulted through email and via the [7<sup>th</sup> UK Biodiversity Indicators Forum](#). There are many different ways of approaching this indicator; following the review, two measures are proposed to be developed.

- a) Measuring the number of businesses with an Environmental or Sustainable Management System (EMS), and
- b) Measuring how widely the environment is considered in the supply chain of businesses and whether there is a formal process carried out to consider the environment.

A government survey called 'The Environmental Protection Expenditure Survey' has been identified as the most appropriate method of collecting data from a range of large and small businesses, and across different sectors. The Environmental Protection Expenditure Survey collects data on how much businesses spend on environmental aspects of their business. It covers a range of sectors including;

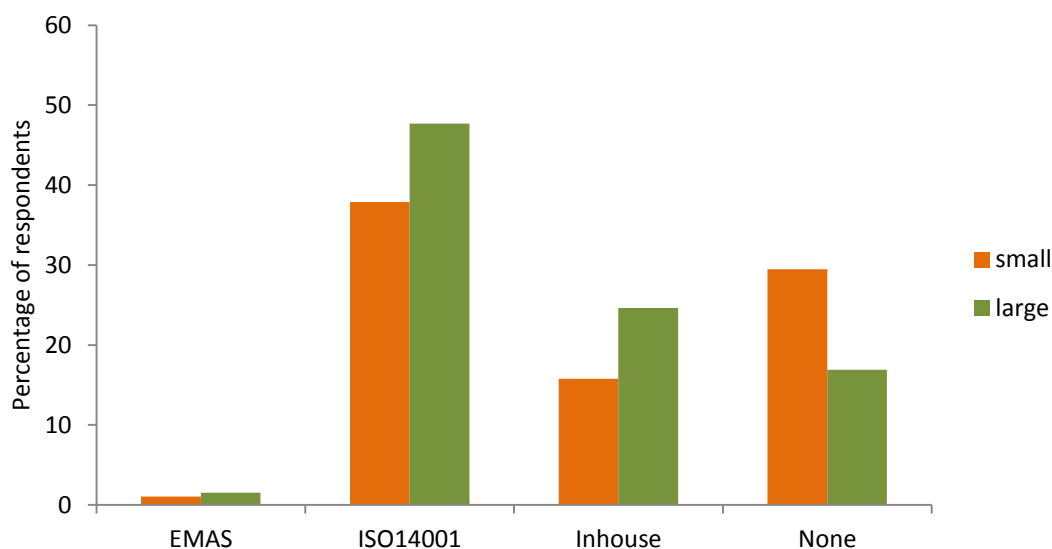
- Mining and Quarrying
- Food, Beverages and Tobacco products
- Coke and Refined Petroleum
- Chemicals and Pharmaceuticals
- Basic and Fabricated Metals
- Machinery and Electrical Equipment
- Energy Production and Distribution
- Water Supply

The current question in the survey on EMS will be amended to cover ISO14001, EMAS, BS8555, in-house written EMS and in-house informal EMS. A second question will be added to the survey to addresses the consideration of the environment in the supply chain. The results from these questions should be available for the next publication of this indicator in October 2014.

It is anticipated that responses from large companies (classed as having 250 or more employees) will be used for the indicator assessment as the survey goes to all of the businesses in the sectors shown above each year and a trend over time can be established. Smaller companies (with less than 250 employees) are not surveyed every year and there is less consistency over time, so it is expected that data from these companies will only be shown as background material.

The data from the current EMS question in the survey, broken down by company size, is shown in Figure A5i. Sixty one per cent of respondents said that they operated some form of EMS in their business in 2011, with ISO14001 having the greatest number of respondents in both small and large companies. Over eighty per cent of companies in the Chemicals and Pharmaceuticals sector and the Machinery and Electrical Equipment sector implemented an EMS in their business in 2011.

**Figure A5i. Percentage of companies surveyed in the Environmental Protection Expenditure survey that use an Environmental Management System, UK, 2011.**



**Notes:**

1. Businesses may operate more than one EMS, therefore the percentages do not add up to 100.
2. The response of 'Don't Know' was also an option on the survey, and 4% of small companies and 9% of large companies responded with this option.

**Source:** Defra.

Future work for this indicator will include investigating whether a list of companies certified through the major bodies is available, this would mean that the total number of companies that operate a certified scheme, such as ISO 14001, could be measured from year to year. This would provide more background information to the data collected in the EPE survey. The sector coverage of the EPE survey may also be expanded to cover a wider range of sectors than those currently included in the survey, for example the construction sector.

## B1. Agricultural and forest area under environmental management schemes

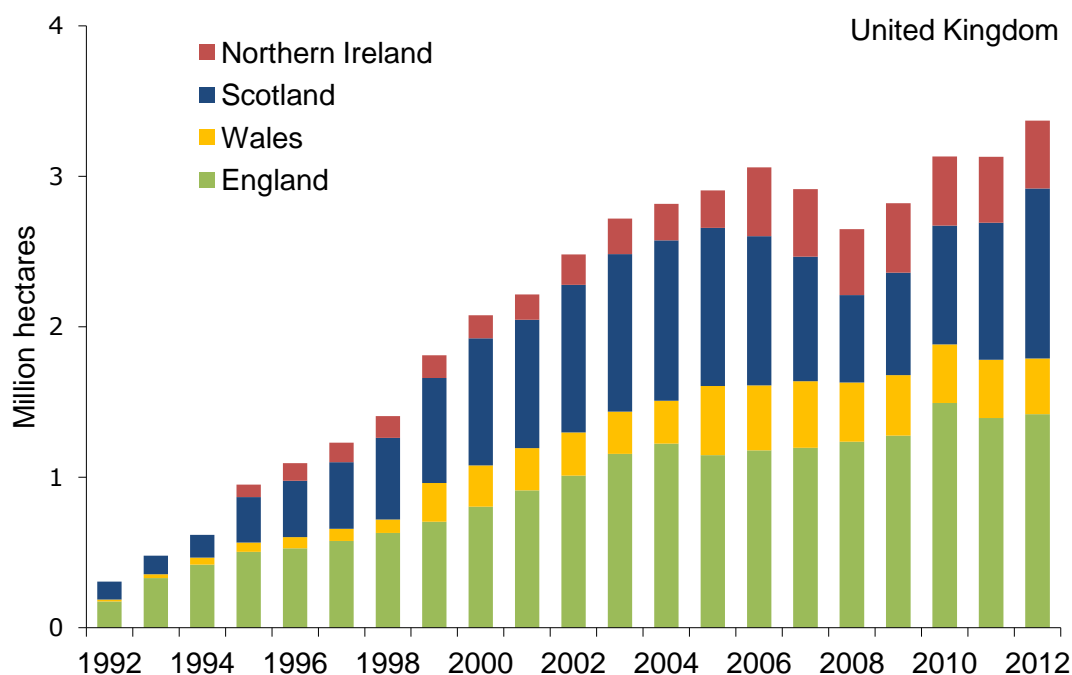
### a. Area of land in agri-environment schemes

#### i. Higher-level / targeted schemes

#### ii. Entry-level type schemes

Type: Response Indicator

**Figure B1ai.** Area of land covered by higher-level or targeted agri-environment schemes, 1992 to 2012.

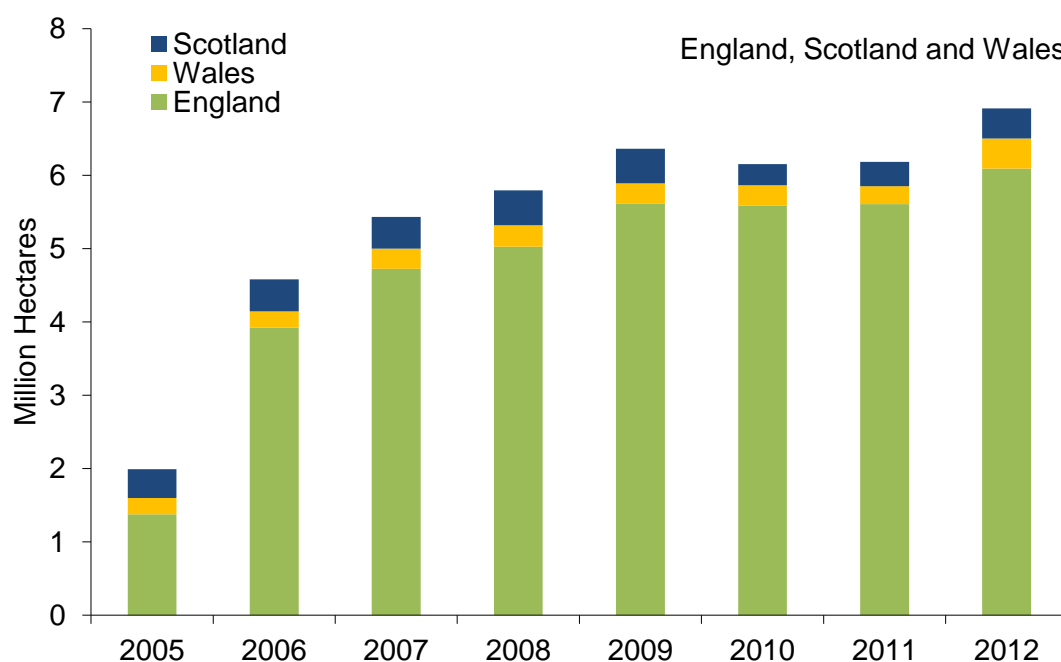


**Notes:**

1. The following schemes have been included 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, Tir Gofal and Glastir Advanced.  
N Ireland: ESA, Countryside Management.
2. Higher-level or targeted agri-environment schemes have stricter criteria for qualification than other agri-environment schemes.

**Source:** Department for Agriculture and Rural Development Northern Ireland, Defra, Natural England, Scottish Government, Welsh Government (Sustainable Futures).

**Figure B1a.ii. Area of land covered by entry-level type, whole-farm agri-environment schemes, 2005 to 2012.**



**Notes:**

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

**Source:** Defra, Natural England, Scottish Government, Welsh Government (Sustainable Futures).

Assessment of change in area of land covered by agri-environment schemes			
	Long term	Short term	Latest year
Higher-level / targeted schemes	✓ 1992–2012	✓ 2007–2012	Increased (2012)
Entry-level type, whole-farm schemes	⊕	✓ 2007–2012	Increased (2012)

- 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 type 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 England from 2010 the Entry Level Scheme data also includes the Upland Entry Level Schemes.
- In 2012 the total area of land in higher-level or targeted agri-environment agreements in the UK was just less than 3.4 million hectares. In the individual countries the proportion of



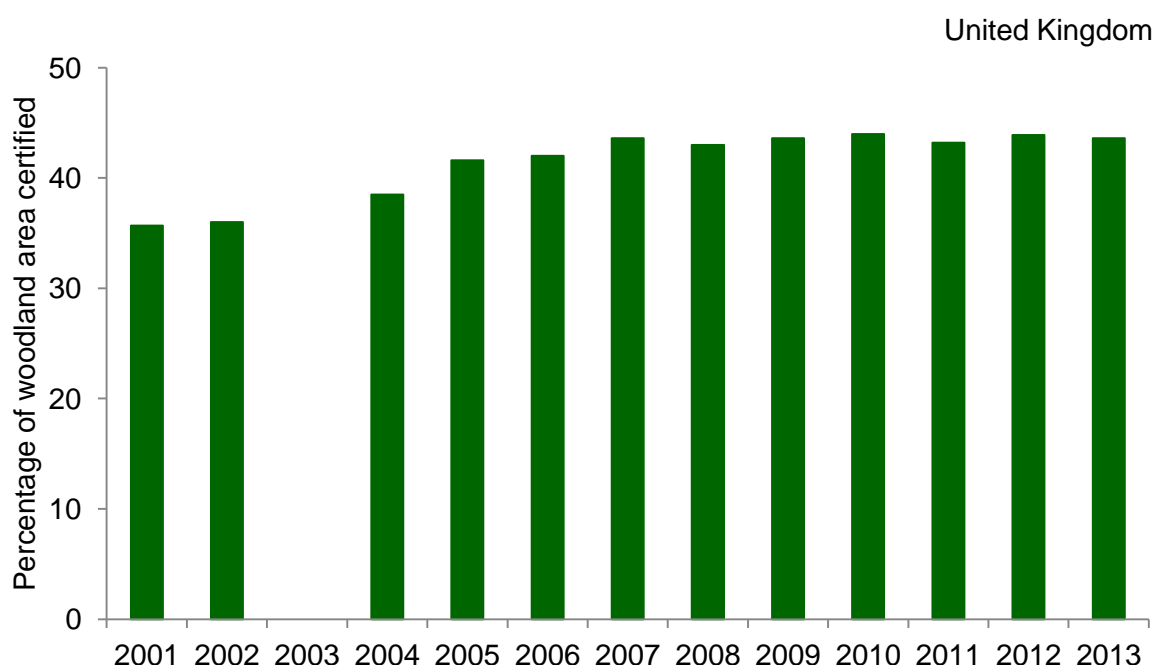
agricultural land managed under higher-level schemes amounts to 16 per cent in England; 24 per cent in Wales; 20 per cent in Scotland and 45 per cent in Northern Ireland.

- In 2012 the total area of land in entry-level type schemes in England, Scotland and Wales was 6.9 million hectares. In the individual countries the proportion of agricultural land managed under entry-level schemes amounts to 68 per cent in England; 26 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; therefore the areas cannot be added to provide a grand total.

## b. Area of forestry land certified as sustainably managed

**Type:** Response Indicator

**Figure B1bi.** Percentage of woodland area certified as sustainably managed, 2001 to 2013.



**Notes:** Figures relate to certificates that were valid up to 31 March 2013.

**Source:** Forestry Commission.

Assessment of change in area of woodland certified as sustainably managed			
	Long term	Short term	Latest year
Percentage of woodland certified	✓ 2001-2013	⚠ 2008-2013	No change (2013)

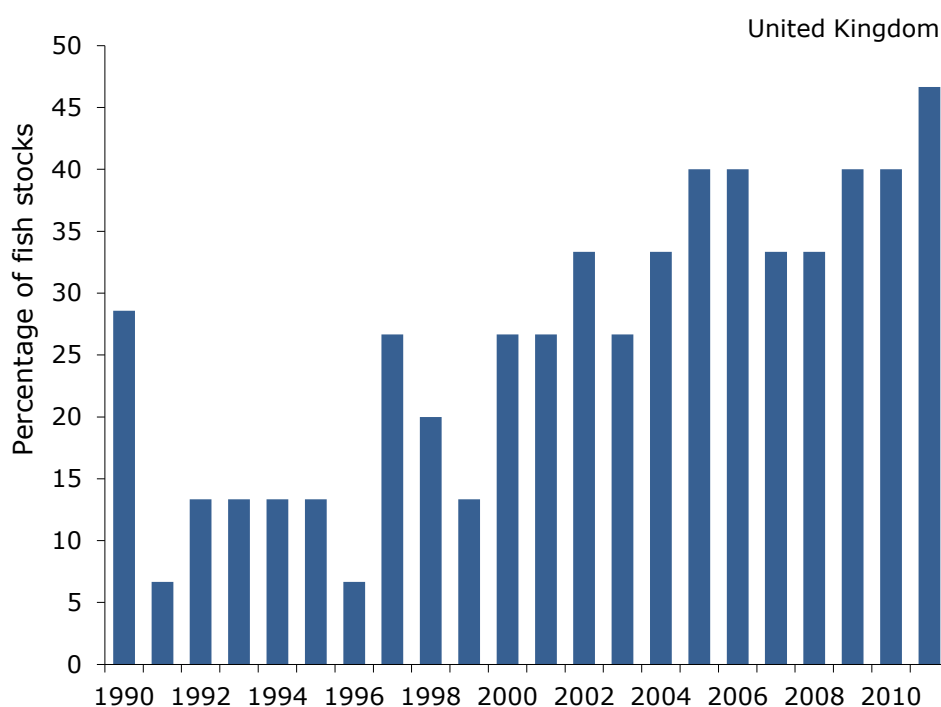
- Certification of woodlands promotes responsible forest management to safeguard forests' natural heritage and protect threatened species. The total area certified can change if new woodlands are certified, if existing certificate holders decide not to renew, or if there is a delay in renewal of an existing certificate.
- Across the UK, the percentage of woodlands under certified sustainable management schemes remained constant between 2012 and 2013 at 44 per cent.

- Within the UK in 2013, the percentage of woodlands certified as sustainably managed was 27 per cent in England, 46 per cent in Wales, 57 per cent in Scotland and 58 per cent in Northern Ireland.
- In 2011, the Forestry Commission implemented a number of refinements to methods for calculating the area certified, using revised woodland area data from the National Forest Inventory together with geo-referenced data for Forestry Commission land. This method has now been applied to the whole data series. The indicator is therefore now based on a revised dataset which cannot be directly compared with previous publications.

## B2. Sustainable fisheries

**Type:** Pressure Indicator

**Figure B2i.** Percentage of fish stocks harvested sustainably and at full reproductive capacity, 1990 to 2011.



**Notes:** Based on 15 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	Short term	Latest year
Sustainable fisheries	 1990–2011	 2006–2011	Increased (2011)

- Sustainable fisheries will help to ensure our marine ecosystems remain diverse and resilient, and provide a long-term and viable fishing industry.
- In 2011, 47 per cent of the 15 assessed fish stocks around the UK were at full reproductive capacity and were being harvested sustainably. Since 2000, between 27 and 40 per cent of the fish stocks around the UK have been at full reproductive capacity and being harvested sustainably, compared to between 7 and 29 per cent in the years from 1990 to 1999.
- International Council for Exploration of the Sea advice in 2012 showed that most of the UK indicator stocks considered to be harvested sustainably and at full reproductive capacity in 2011 were also being fished at or below the rate providing long-term maximum sustainable yield (MSY).

### B3. Climate change adaptation

#### Indicator under development – progress to date

According to the UK Meteorological Office, the average temperature over the first decade of the 21st century was significantly warmer than any preceding decade in the series of records stretching back over 160 years. In September [2013](#), the Intergovernmental Panel on Climate Change (IPCC) concluded that it was 95 per cent certain that humans are the "dominant cause" of global warming since the 1950s, and that warming is projected to continue under all scenarios. Model simulations indicate that global surface temperature change by the end of the 21st Century is likely to exceed 1.5 degrees Celsius relative to 1850.

The IPCC's Fourth Assessment Report defines climate change adaptation as '*adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*'. Actions that are taken to adapt to climate change can reduce the risk of biodiversity loss, and provide opportunities for biodiversity to adapt to changing circumstances.

The breadth of issues that indicators need to cover are highlighted by the England Biodiversity Strategy Climate Change Adaptation Principles (Smithers *et al.* 2008), which are aimed at people responsible for planning and delivering actions across a wide range of sectors. There are five main principles:

- *Take practical action now;*
- *Maintain and increase ecological resilience;*
- *Accommodate change;*
- *Integrate action across all sectors;*
- *Develop knowledge and plan strategically.*

Notably, they include many elements that are neither new nor specific to climate change adaptation.

An initial review broadly matched the principles with existing UK biodiversity indicators. An online survey sought information on other appropriate existing indicators and reliable and robust data that might aid development of indicators for those principles for which no suitable indicators exist or better ones might be developed. UK specialists in the field of climate change adaptation then met at two workshops to tackle issues surrounding definitions, refine indicator suggestions, and develop indicator options that would be possible for implementation within a short timeframe. The quality of each potential indicator was evaluated against specified criteria in order to develop a

shortlist of options. Three indicator options were short-listed for development, and were reviewed through the [6<sup>th</sup> UK Biodiversity Indicators Forum](#):

- A. water stress in protected areas
- B. gains and losses in coastal habitats (including intertidal and saltmarsh)
- C. wildfire incidents

In addition, the concept of using the other indicators to help to provide a narrative of climate change adaptation was considered. Subsequent discussions in the UK Biodiversity Indicators Steering Group concluded that work should taken forward on options A and B, and that the narrative concept deserved more work, but that it might be more useful at a country than UK level.

It has subsequently become clearer that further detailed work is necessary to collate UK level data on coastal gains, and on water stress on protected areas. Further work to define these indicators will therefore be necessary, but it is hoped that new measures will be published in 2014.

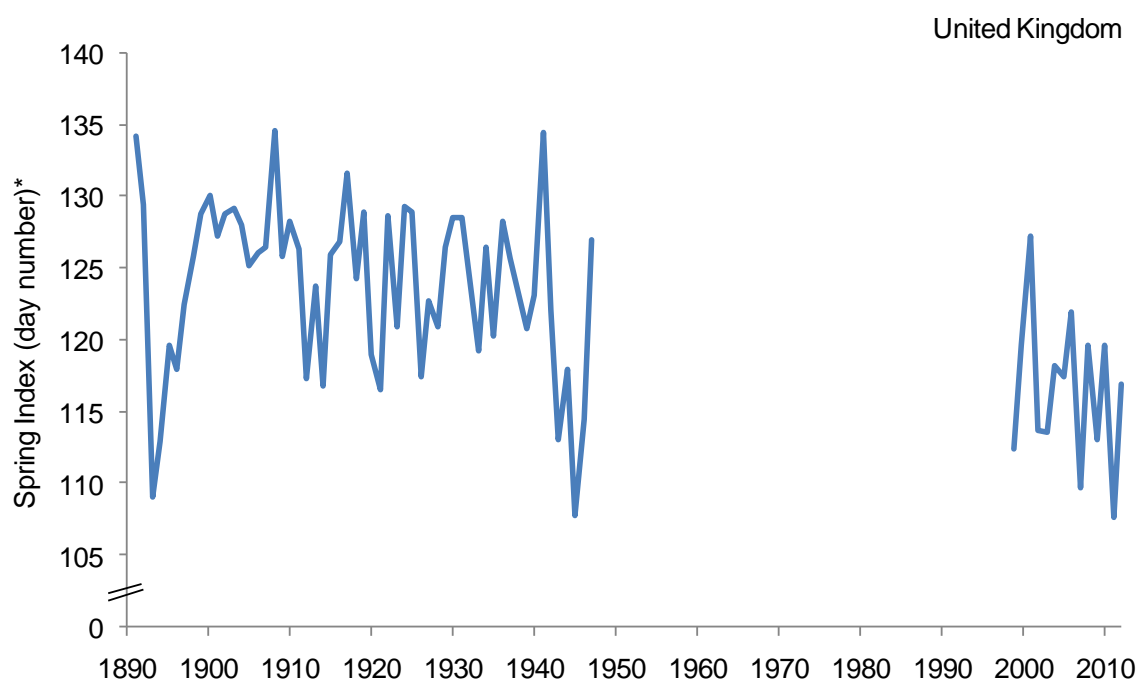
Smithers, R.J., Cowan C., Harley, M., Hopkins, J.J., Pontier, H. and Watts, O. (2008) England Biodiversity Strategy: Climate Change Adaptation Principles. Conserving biodiversity in a changing climate. Defra, London. <http://www.defra.gov.uk/publications/files/pb13168-ebs-ccap-081203.pdf>.

## B4. Pressure from climate change

### Spring Index

**Type:** Context indicator

**Figure B4i.** Index of the timing of biological spring events (number of days after 31 December) in the UK, 1891 to 1947 and 1999 to 2012.



**Notes:** \* Number of days after 31 December (e.g. day 121 = 1 May).

**Source:** 1891 to 1947 Royal Meteorological Society, 1999 to 2012 UK Phenology Network.

- This is a contextual indicator showing how changes in climate, particularly temperature, are 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 an orange-tip butterfly (*Anthocharis cardamines*) and first sighting of a swallow (*Hirundo rustica*).
- The 1891 to 1947 data were mostly collected by the Royal Meteorological Society and the 1999 to 2012 data by the UK Phenology Network.
- Since 1999, the annual mean observation dates have been around 7.5 days in advance of the average dates in the first part of the 20th century. The Index shows a strong relationship with mean temperature in March and April, and it advances more rapidly when the mean temperature exceeds 7°C. The mean observation dates in 2011 were the earliest for which there are records, being 0.2 days earlier than the previously most advanced dates in 1945. The warmest April in the Central England Temperature series (1659 onwards) occurred in 2011 and was almost certainly influential.

## B5. Pressure from pollution

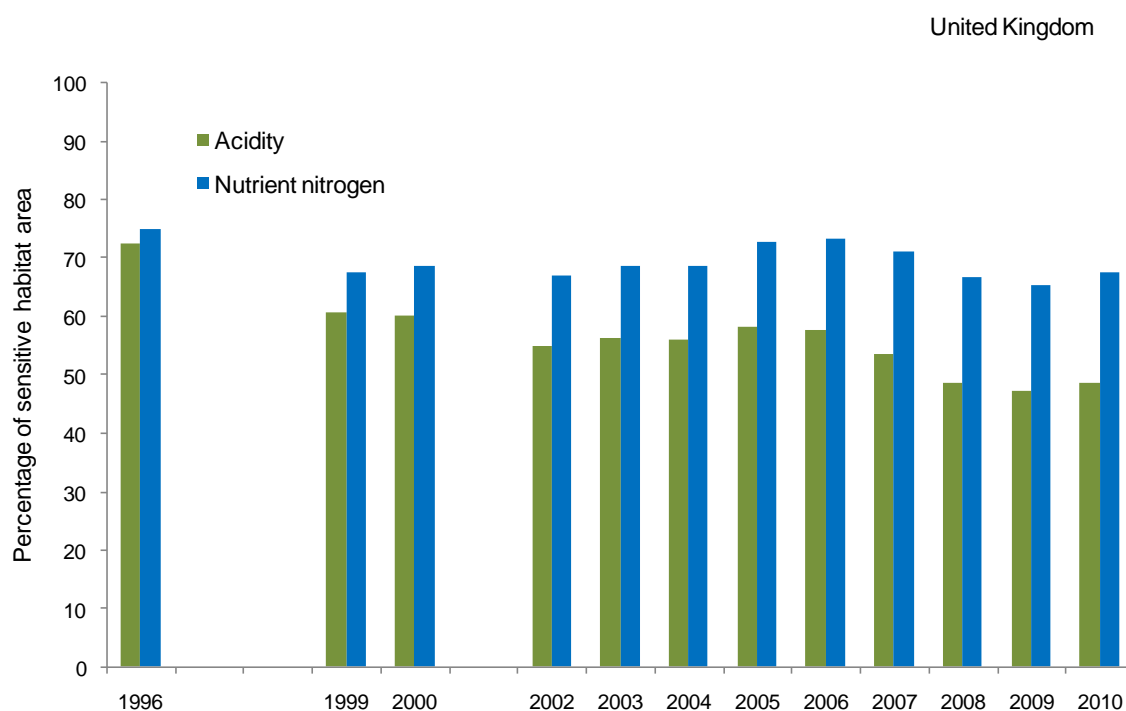
### a. Air pollution

#### i. Area affected by acidity

#### ii. Area affected by nitrogen

Type: Pressure Indicator

**Figure B5ai.** Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication, 1996 to 2010.



**Notes:**





1. 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.

2. Each column represents critical load exceedances based on a three-year average of deposition data to reduce year-to-year variability.

**Source:** Centre for Ecology and Hydrology.

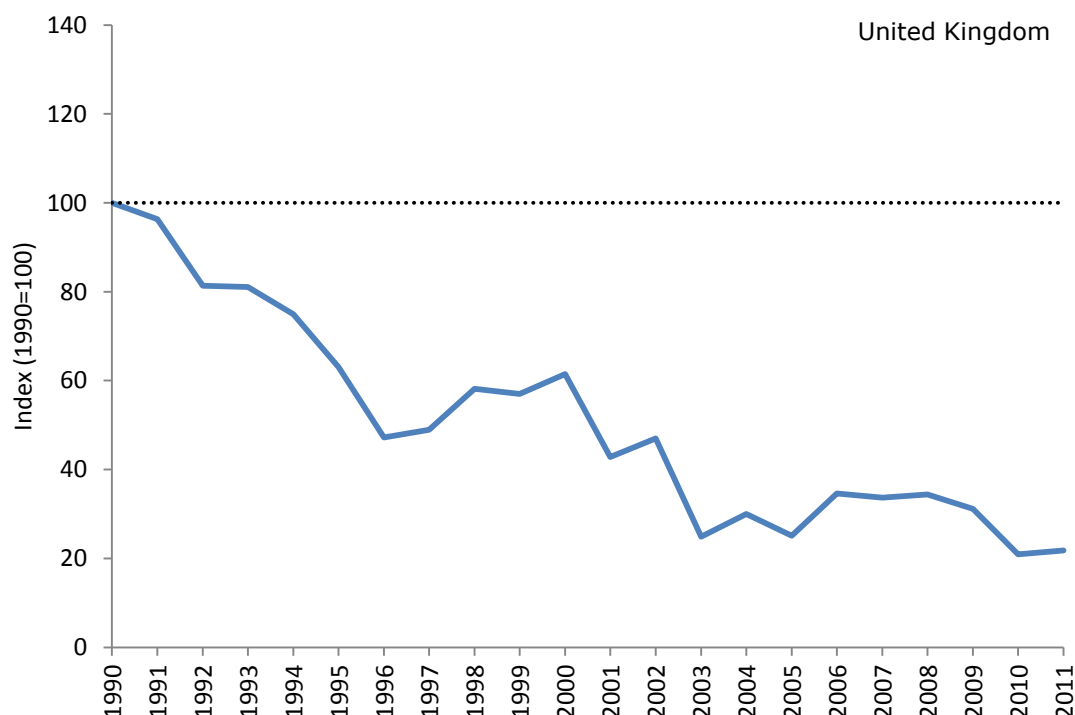
<b>Assessment of change in area of sensitive habitat exceeding critical loads</b>			
	<b>Long term</b>	<b>Short Term</b>	<b>Latest year</b>
Area affected by acidity	 1996–2010	 2005–2010	No change (2010)
Area affected by nitrogen	 1996–2010	 2005–2010	No change (2010)

- Critical loads are thresholds for the deposition of pollutants causing acidification and/or eutrophication above which significant harmful effects on sensitive UK habitats may occur. The pollutants arise mainly from burning fossil fuels and emissions from livestock waste. Around a third of UK land area is sensitive to acidification, and a third to eutrophication (with some areas sensitive to both).
- In 1996, acid deposition exceeded critical loads in 73 per cent of the area of sensitive habitats. This declined to 49 per cent in 2010. There has also been a decrease in the area affected over the short term, since 2005.
- In 2010, nitrogen deposition exceeded critical loads in 68 per cent of sensitive habitats. This was a decrease from a level of 75 per cent in 1996. There was also a decrease between 2005 and 2010.

## b. Marine pollution

**Type:** Pressure indicator

**Figure B5bi.** Combined input of hazardous substances to the UK marine environment, as an index of estimated weight of substances per year, 1990 to 2011.



**Source:** Defra Marine Strategy and Evidence Division, using data provided by: Environment Agency, Scottish Environmental Protection Agency and Northern Ireland Environment Agency.

Assessment of change in input of hazardous substances			
	Long Term	Short term	Latest year
Combined input of hazardous substances	✓ 1990–2011	✓ 2006–2011	No change (2011)

- The indicator shows the combined input of six of the most hazardous substances to the UK marine environment.
- Levels of all six substances declined over the period 1990 to 2011. In the case of three substances (cadmium, lindane and mercury) inputs have declined by more than 75 per cent over this time period and in the case of copper, lead and zinc inputs have declined between 60 and 65 per cent.
- Levels of all six substances have also declined between 2006 and 2011, with levels of lead decreasing at the highest rate over this period declining by over 60 per cent.

## B6. Pressure from invasive species

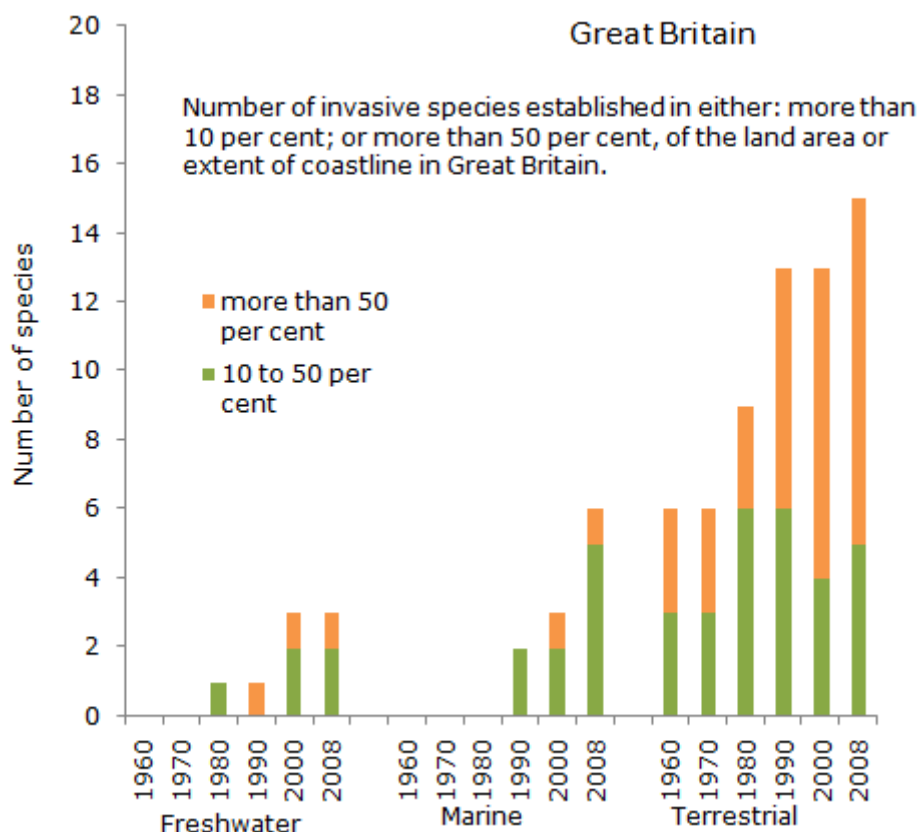
### a. Freshwater invasive species

### b. Marine invasive species

### c. Terrestrial invasive species

**Type:** Pressure Indicator

**Figure B6i.** 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.

Assessment of change in the extent of invasive species			
	Long term	Short term	Latest year
Freshwater invasive species	✗ 1960–2008	⚡ 2000–2008	N/A
Marine invasive species	✗ 1960–2008	✗ 2000–2008	N/A
Terrestrial invasive species	✗ 1960–2008	✗ 2000–2008	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

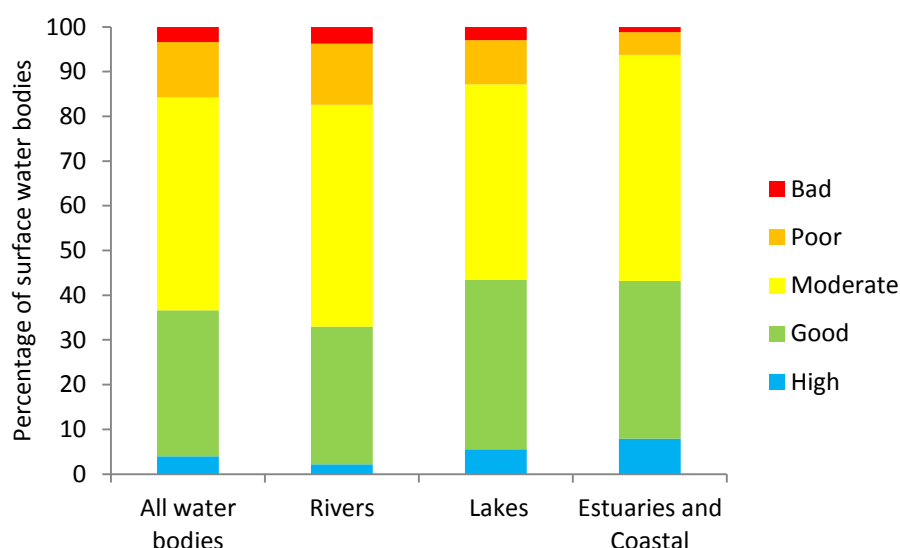
consumption, parasitism or hybridisation. Invasive non-native species have one or more of these negative impacts and a high capacity for spread to natural and semi-natural habitats.

- Over the period 1990 to 2008, non-native species have become more prevalent in the countryside.
- 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.

## B7. Water quality

**Type:** State Indicator

**Figure B7i. Ecological classification of UK surface water bodies under the Water Framework Directive, 2009**



**Notes:**

1. Based on the number of surface water bodies classified under the Water Framework Directive.
2. A water body is a management unit defined by the relevant authorities.

**Source:** Water Information System for Europe (WISE) database, European Environment Agency.

Assessment of change in ecological status of UK surface water bodies			
	Long term	Short term	Latest year
Percentage of UK surface water bodies in High or Good ecological status	Not Assessed	Not Assessed	Not Assessed (2013)

- In 2009 37 per cent of all water bodies in the UK were at high or good ecological status according to the EU database for Water Framework Directive (WFD) data.

- Estuaries, coastal waters and lakes had the highest percentage of high or good ecological status, both at 43 per cent.

## C1. Protected areas

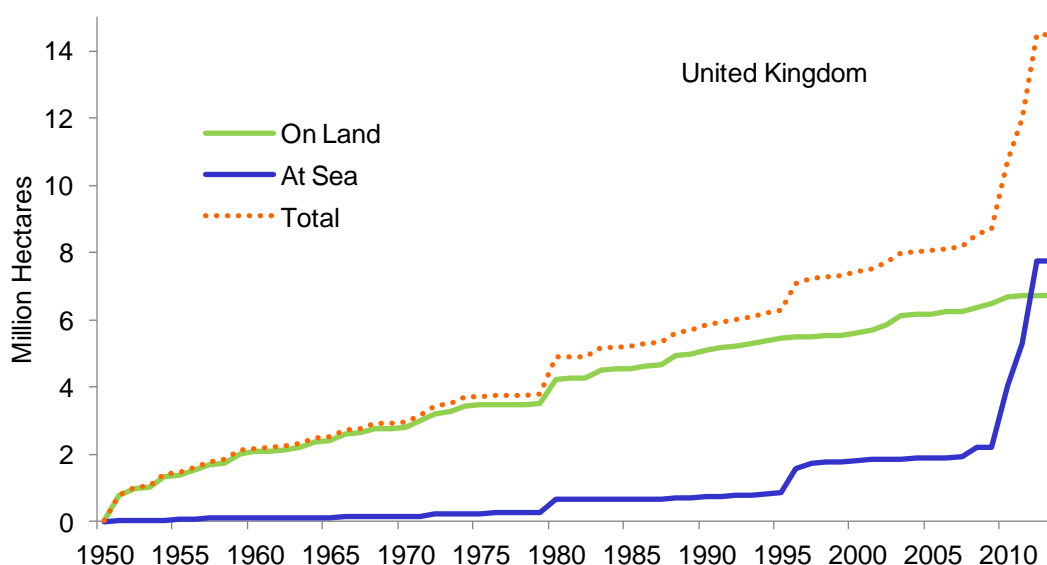
### a. Total area of protected areas: on land

### b. Total area of protected area: at sea

### c. Condition of Areas / Sites of Special Scientific Interest

**Type:** Extent – Response Indicator; Condition – State / Response Indicator

**Figure C1i.** Extent of UK nationally and internationally important protected areas: (i) on land; (ii) at sea, 1950 to 2013.



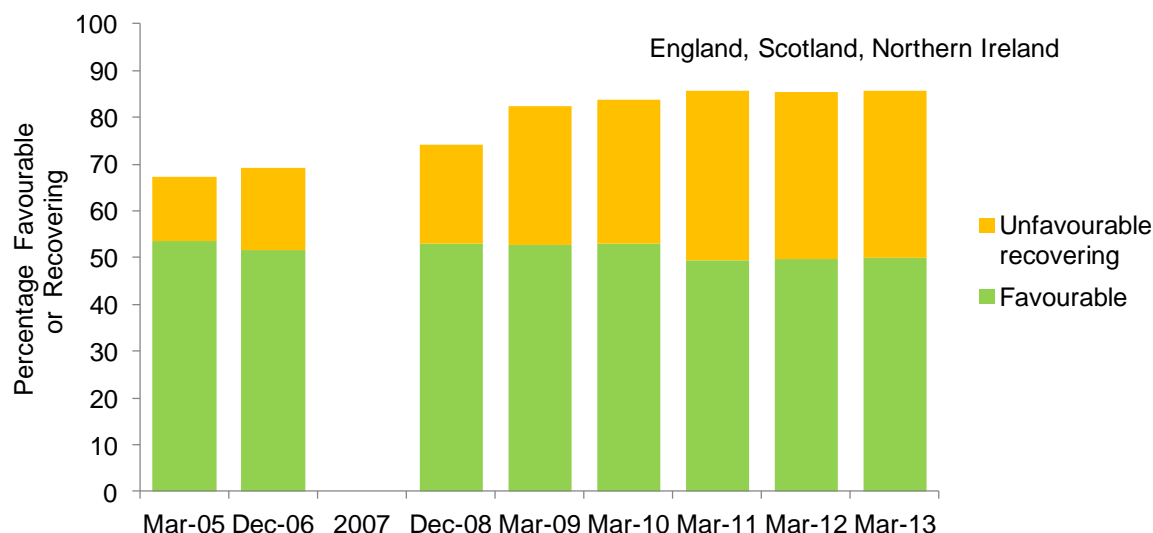
#### Notes:

1. The demarcation between protected areas on-land and at-sea is mean high water (mean high water spring in Scotland). Coastal sites in the indicator are split between 'on land' and 'at sea' depending on whether they cross the mean high water mark. At-sea extent includes offshore marine protected areas out to the limit of the UK continental shelf.
2. Based on calendar year of site designation, except 2013 for which data are to the end of June.
3. The 2013 indicator includes a data revision, to account for the date of designation of sites designated under the National Parks and Access to the Countryside Act 1949 and their re-designation under the Wildlife and Countryside Act 1981. The indicator is therefore not comparable with earlier years.
4. Extent is based on the following site designations: Areas of Special Scientific Interest, Sites of Special Scientific Interest, Special Areas of Conservation (including candidate Special Areas of Conservation and Sites of Community Interest), Special Protection Areas, Areas of Outstanding Natural Beauty, National Scenic Areas, and National Parks.



**Source:** Joint Nature Conservation Committee, Natural England, Natural Resources Wales, Northern Ireland Environment Agency and Scottish Natural Heritage.

**Figure C1ii. Cumulative proportion of Areas of Special Scientific Interest (Northern Ireland) and Sites of Special Scientific Interest (England and Scotland) in 'favourable' or 'unfavourable-recovering' condition, 2005 to 2013.**



**Notes:**

1. England figures based on area, Scotland and Northern Ireland figures based on number of features.
2. Based on financial years (1 April to 31 March) unless otherwise stated.
3. The 2013 indicator includes a data revision to split the data into favourable and unfavourable recovering. As a result of the calculation method there may be small differences from previously published results.
4. Imputation has been used to calculate the breakdown between favourable and recovering for Northern Ireland for the years 2009 to 2011.
5. 'Recovering' is used in the graph above, and throughout the document, as a convenient shorthand for the condition category 'unfavourable-recovering'.

**Source:** Natural England, Northern Ireland Environment Agency, Scottish Natural Heritage.

Assessment of change in area and condition of UK protected areas			
	Long term	Short term	Latest year
Total extent of protected areas on land	✓ 1950–2013	✓ 2008–2013	No change (2013)
Total extent of protected areas at sea	✓ 1950–2013	✓ 2008–2013	No change (2013)
Condition of A/SSSIs	⊖	✓ 2008–2013	No change (2013)

- The overall total extent of land and sea protected in the UK through national and international protected areas, and through wider landscape designations, has increased by nearly 6 million hectares, from just over 8.5 million hectares in December 2008 to just under 14.5 million hectares in June 2013.
- A large contribution to this has been from the marine environment, following the designation of inshore and offshore marine sites under the Habitats Directive – the area of protected areas at-

sea increased by more than 5.5 million hectares between 2008 and 2013. The extent of protected areas on-land has increased by more than 300,000 hectares since 2008.

- The indicator also shows the condition of Areas or Sites of Special Scientific Interest (A/SSSIs) on land. A/SSSIs are surveyed periodically to assess whether they are in good condition ('favourable') or, if not, whether they are under positive management ('unfavourable-recovering').
- Since 2005, the percentage of features, or area, of A/SSSIs in favourable or recovering condition has increased by 18 per cent. Since 2008 the increase is just over 11 per cent. The proportion of features or area of land in favourable condition has declined slightly since 2005. The proportion of features or area of land in unfavourable-recovering condition has increased from 14 per cent in 2005 to 35 per cent in 2013. These changes reflect improved management of sites, but may also be affected by a greater number of sites/features having been assessed over time.

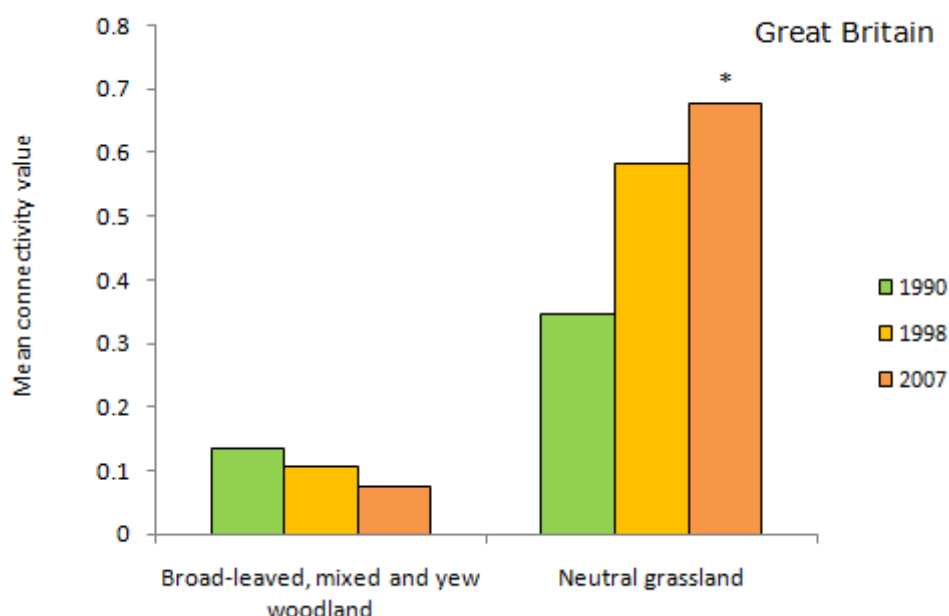
## C2. Habitat connectivity

### a. Broad-leaved, mixed and yew woodland

### b. Neutral grassland

**Type:** State Indicator

**Figure C2i.** 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 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.

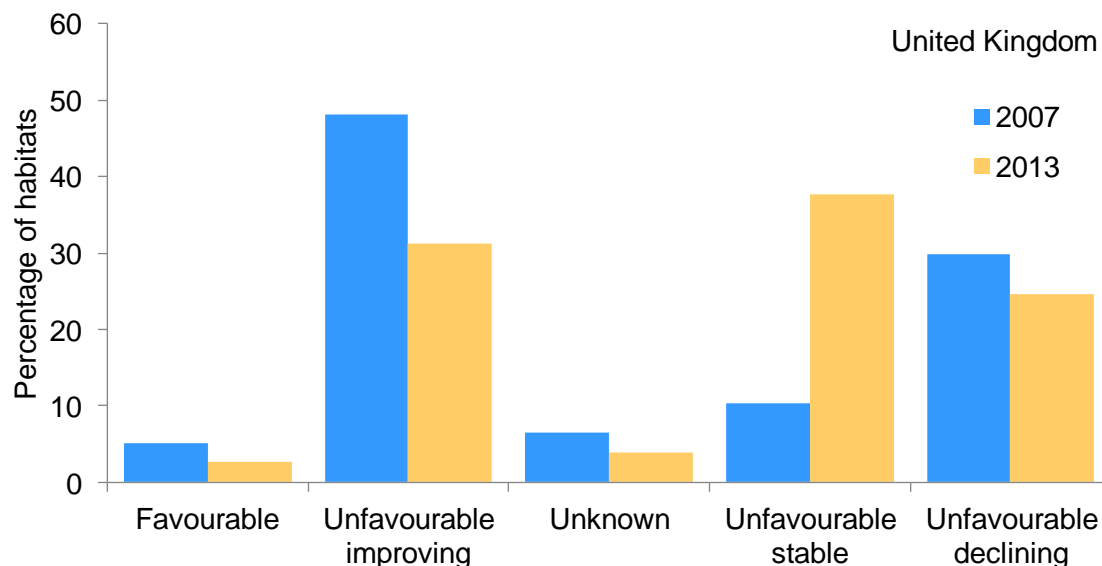
Assessment of change in habitat connectivity for selected broad habitats			
	Long term	Short term	Latest year
Broad-leaved, mixed and yew woodland	⊙	⊙	N/A
Neutral grassland	⊙	⊙	N/A

- Connectivity is a measure of the size and distribution of patches of habitat and the relative ease with which typical species can move through the landscape between the patches. The measures here show connectivity for woodland and neutral grassland habitats. Maintaining and improving connectivity is important in ensuring the long-term survival of biodiversity in a fragmented landscape, especially under a changing climate.
- There was little or no overall change in the degree of connectivity for broad-leaved, mixed and yew woodland between 1990 and 2007. Over the same period there has been an increase in the area of broad-leaved woodland, which would tend to increase connectivity. However this may have been countered by changes in woodland pattern, changes in the wider landscape, or both, which reduced connectivity, and hence overall there was no significant change.
- There was an increase in the degree of connectivity for neutral grassland between 1990 and 2007, although the change between 1998 and 2007 is not statistically significant. Between 1990 and 2007 there has been an increase in the overall area of neutral grassland. 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.

### C3. Status of habitats of European importance

**Type:** State Indicator

**Figure C3i.** Percentage of UK habitats of European importance in improving or declining conservation status in 2007 and 2013.



**Notes:**

1. Graph based on 77 habitats listed on Annex I of the Habitats Directive.
2. The aim of the Habitats Directive is to achieve favourable conservation status for the species and habitats listed in its Annexes. An assessment of status and trends for each species and habitat is undertaken every six years. Trends in unfavourable conservation status allow identification of whether progress is being made, as it will take many years for some habitats and species to reach favourable conservation status.

**Source:** UK Habitats Directive (Article 17) reports 2007 and 2013.

Assessment of change in status of UK habitats of European importance			
	Long term*	Short Term	Latest year
Percentage of UK habitats of European importance in favourable or improving conservation status	↔	✗ 2007–2013	Decreased (2013)

\*A long term assessment is not made as the data do not go back more than 10 years.

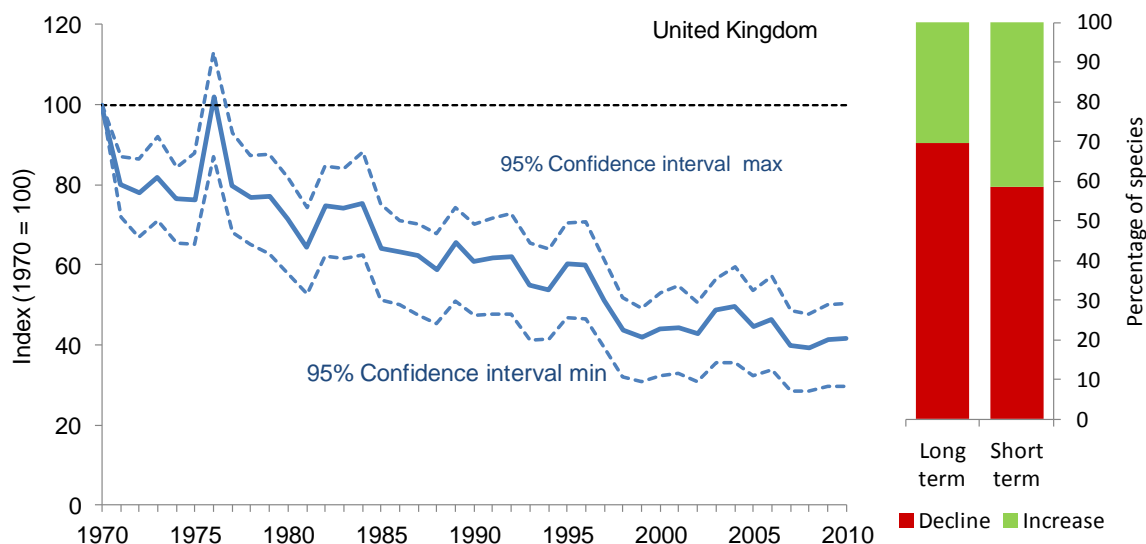
- In 2007 5 per cent of habitats listed on Annex I of the Habitats Directive were in favourable conservation status, declining to 3 per cent in 2013.
- The conservation status of 48 per cent of habitats was improving in 2007. In 2013, 31 per cent were improving.
- The conservation status of 30 per cent of the habitats was declining in 2007. In 2013, 25 per cent were declining.
- The information sources on which the assessments are based vary between habitats – their quality is documented in the database which underpins the assessments. The changes are largely based on evidence, though expert opinion was used in a few cases where evidence was not available.

## C4. Status of threatened species

### a. Priority species

Type: State Indicator

**Figure C4ai.** Change in the relative abundance of priority species in the UK, 1970 to 2010.



#### Notes:

1. Based on 210 species. Dotted lines show the 95 per cent confidence intervals relative to the 1970 reference year.
2. The bar chart to the right of the line graph shows the percentage of species increasing or declining over the long-term (1970 to 2010) and the short-term (2005 to 2010).
3. All species in the indicator are present on one or more of the country priority species lists (Natural Environmental and Rural Communities Act 2006 - Section 41 (England) and Section 42 (Wales), Northern Ireland Priority Species list, Scottish Biodiversity List).

**Source:** Bat Conservation Trust, British Trust for Ornithology, Butterfly Conservation, Centre for Ecology & Hydrology, Defra, Joint Nature Conservation Committee, People's Trust for Endangered Species, Rothamsted Research, Royal Society for the Protection of Birds.

Assessment of change in status of priority species in the UK			
	Long term	Short term	Latest year
Priority species	⊗ 1970–2010	⊗ 2005–2010	No change (2010)

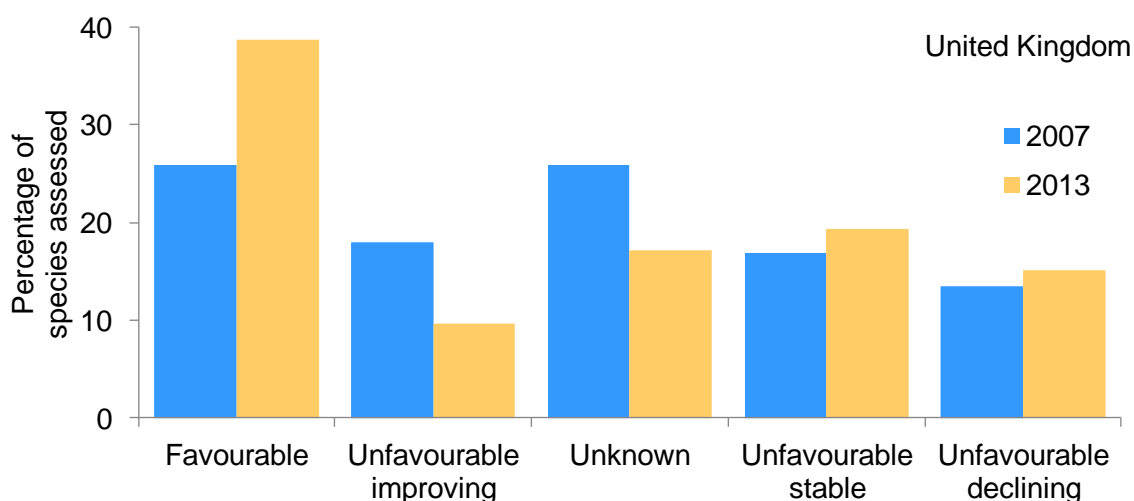
- Official lists of priority species have been published for each UK country and actions to conserve these priority species are included within the respective country strategies. The species included in the indicator are those on one or more of these priority species lists for which population data are available.
- Between 1970 and 2010, populations of priority species declined to 42 per cent of the original index value, a statistically significant decrease. Within the index over this long term period, 30 per cent of species showed an increase and 70 per cent showed a decline.

- Between 2005 and 2010, populations of priority species declined by seven per cent relative to their value in 2005, a statistically significant decrease. Within the index over this short term period, 41 per cent of species showed an increase and 59 per cent showed a decline.
- The measure is a composite indicator of 210 species from the following taxonomic groups for which there are sufficient data to create a time series: birds, butterflies, mammals, and moths. They have not been selected as a representative sample of priority species and they cover only a limited range of taxonomic groups. The measure is therefore not representative of species in the wider countryside. The time series have been combined cover different time periods, were collected using different methods and were analysed using different statistical techniques. In some cases data have come from non-random survey samples. See the technical background document for more detail.

## b. Status of species of European importance

**Type:** State Indicator

**Figure C4bi.** Percentage of UK species of European importance in improving or declining conservation status in 2007 and 2013.



### Notes:

- The number of species assessed was 89 in 2007 and 93 in 2013.
- Graph based on species listed on Annexes II, IV and V of the Habitats Directive, but excluding vagrants.
- The aim of the Habitats Directive is to achieve favourable conservation status for the species and habitats listed in its Annexes. An assessment of status and trends for each species and habitat is undertaken every six years. Trends in unfavourable conservation status allow identification of whether progress is being made, as it will take many years for some habitats and species to reach favourable conservation status.

**Source:** UK Habitats Directive (Article 17) reports 2007 and 2013.

Assessment of change in status of UK species of European importance			
	Long term*	Short term	Latest year
Percentage of UK species of European importance in favourable or improving conservation status	⊕⊕⊕	🟢 2007–2013	Increased (2013)

\*A long term assessment is not made as the data do not go back more than 10 years.



- In 2007 26 per cent of species listed on Annexes II, IV or V of the Habitats Directive were in favourable conservation status, increasing to 39 per cent in 2013.
- The conservation status of 18 per cent of species was improving in 2007. In 2013, 10 per cent were improving.
- The conservation status of 13 per cent of the species was declining in 2007. In 2013, 15 per cent were declining.
- The information sources on which the assessments are based vary between species – their quality is documented in the database which underpins the assessments. The changes are largely based on evidence, though expert opinion was used in a few cases where evidence was not available.

## C5. Birds of the wider countryside and at sea

### a. Farmland birds

### b. Woodland birds

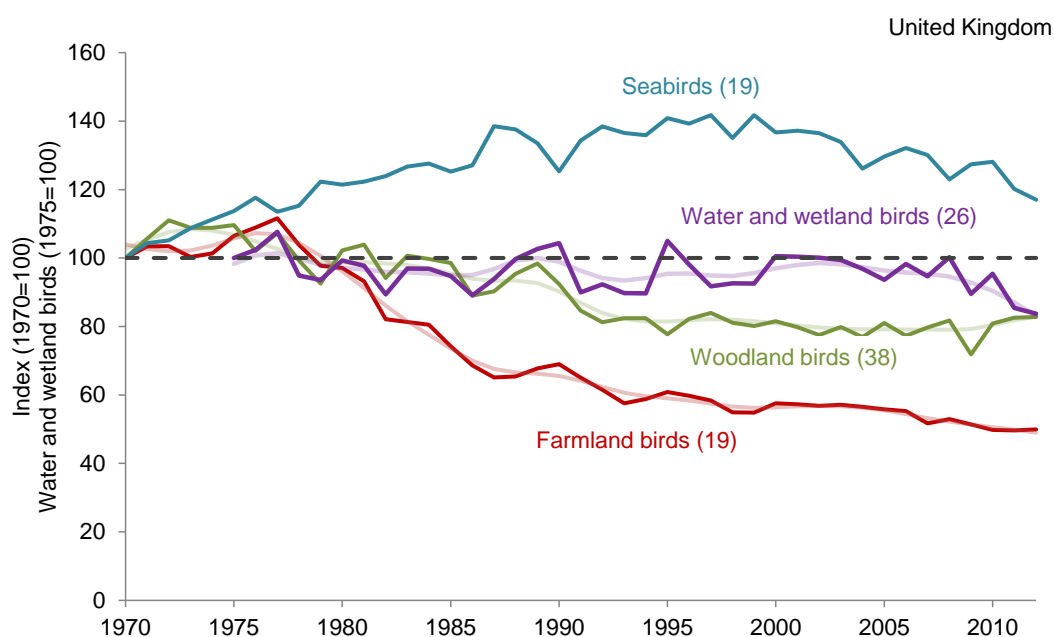
### c. Wetland birds

### d. Seabirds

### e. Wintering water birds

Type: State Indicator

**Figure C5i. Breeding farmland birds, woodland birds, wetland birds, and seabirds, 1970 to 2012.**



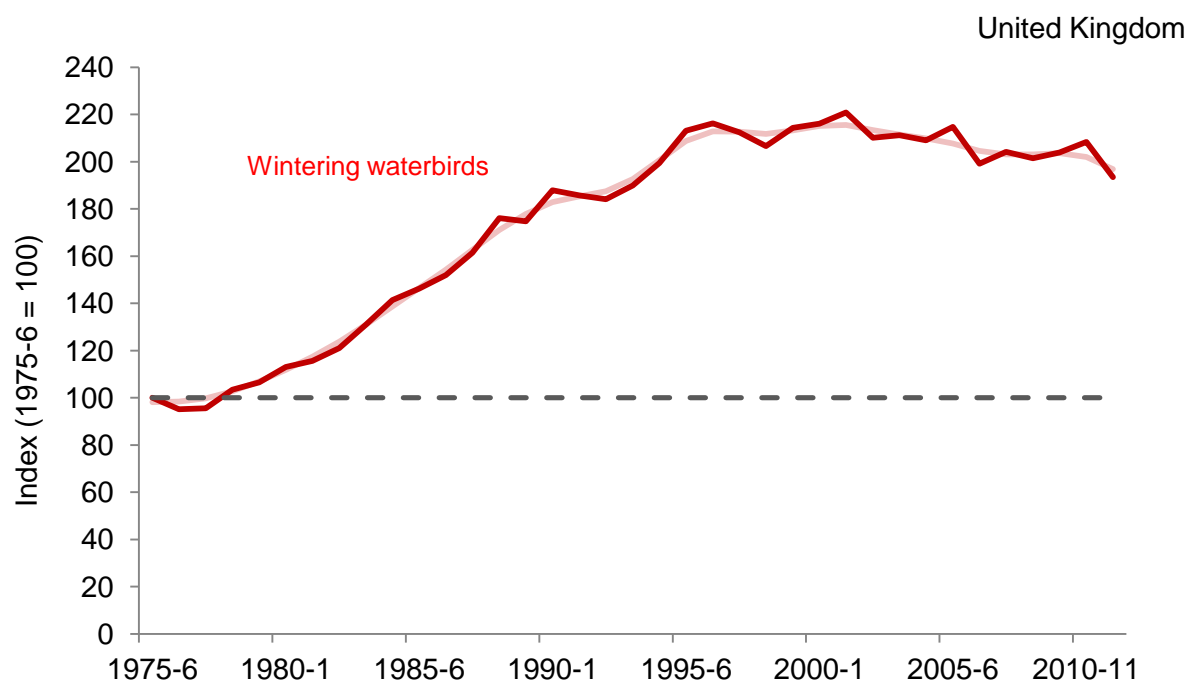
**Notes:**

1. Figures in brackets show the number of species included in each measure.

2. Within each category, darker lines show unsmoothed data and paler lines of the same colour show smoothed trend data. Smoothed data are available for farmland, woodland, and wetland birds, but not for seabirds.

**Source:** British Trust for Ornithology, Defra, Joint Nature Conservation Committee, RSPB.

**Figure C5ii.      Wintering water birds, 1975-6 to 2011-12.**



**Notes:**

1. Based on 46 species.
2. Based on financial years.
3. Darker line shows unsmoothed data and paler line of the same colour shows smoothed trend data.

**Source:** British Trust for Ornithology, Defra, Joint Nature Conservation Committee, RSPB.

Assessment of change in bird populations			
	Long term	Short term	Latest year
Farmland birds	✗ 1970–2011	✗ 2006–2011	No change (2012)
Woodland birds	✗ 1970–2011	✓ 2006–2011	No change (2012)
Wetland birds	✗ 1975–2011	✗ 2006–2011	No change (2012)
Seabirds	✓ 1970–2012	✗ 2007–2012	No change (2012)
Wintering water birds	✓ 1975/6 – 2010/11	⚠ 2005/6 – 2010/11	Decreased (2011-12)

**Notes:** While percentage changes in these indices are reported based on the most recent unsmoothed data point (2012) any long and short term assessment of the statistical significance of these changes is made using the smoothed data point from 2011. This is because, due to the methods used to produce smooth trends, the most recent smoothed data point (for 2012) is likely to change in next year's update when additional data are included for 2013. Analysis of the underlying trends is undertaken by the data

providers. Smoothed data are available for farmland, woodland, wetland and wintering water birds, but not for seabirds.

- Between 1970 and 2012, populations of breeding farmland and woodland birds declined by 50 per cent and 17 per cent respectively. In 2012 the breeding seabird populations were 17 per cent higher than the 1970 level, and the population index for breeding water and wetland birds was 16 per cent lower than in 1975. All of these changes are statistically significant.
- In the shorter-term, between 2006 and 2011, populations of woodland birds have risen by seven per cent, whilst populations of breeding farmland birds have declined by almost ten per cent and water and wetland birds by 13 per cent. Between 2007 and 2012 the populations of seabirds have declined by nine per cent. The analysis of the underlying trends shows that these changes are statistically significant.
- In 2011-12, populations of the wintering water birds were 94 per cent higher than in 1975-6. There has been a decline in more recent years since populations peaked in 2001-2; the measure has fallen by 12 per cent since the winter of 2001-2 but has remained stable in the five years to 2010-11.

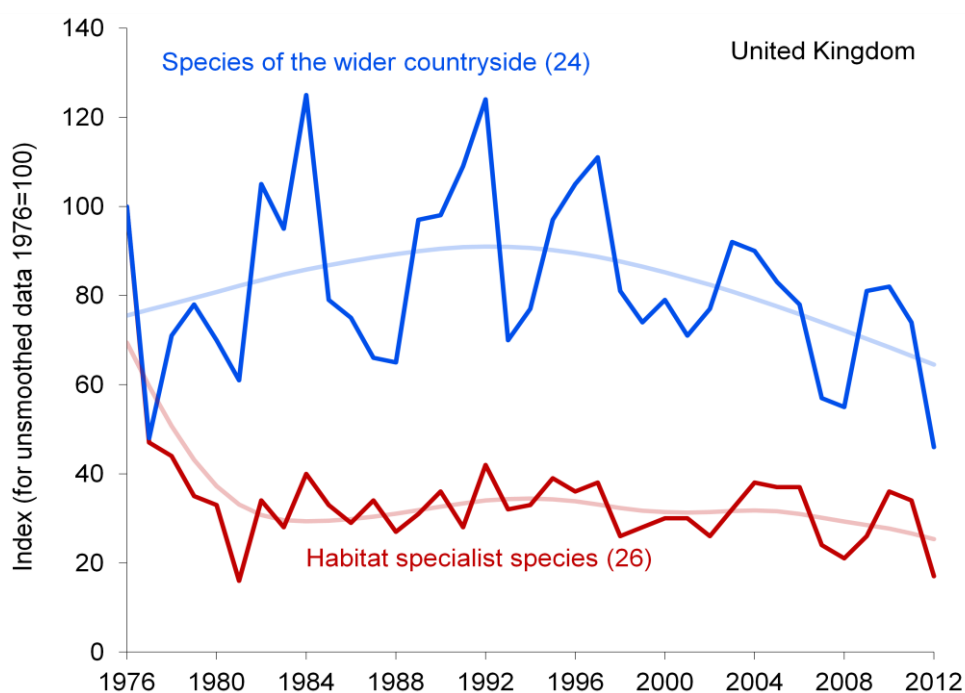
## C6. Insects of the wider countryside (butterflies)

### a. Semi-natural habitat specialists

### b. Species of the wider countryside

**Type:** State Indicator

**Figure C6i.** Trends in butterfly populations for habitat specialists and species of the wider countryside, 1976 to 2012.







#### Notes:

1. Figures in brackets show the number of species included in each category.

2. Within each category, darker lines show unsmoothed data and paler lines of the same colour show smoothed trend data.

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

Assessment of change in butterfly populations			
	Long term	Short term	Latest year
Semi-natural habitat specialists	 1976–2012	 2007–2012	Decreased (2012)
Species of the wider countryside	 1976–2012	 2007–2012	Decreased (2012)

- Since 1976, the indices for butterflies associated strongly with semi-natural habitats (habitat specialists) and for those found in the wider countryside show apparent declines of 83 per cent and 54 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 habitat specialist butterflies have declined significantly but for species of the wider countryside there has been little or no overall long-term change, although the current index is significantly lower than over the period 1982 to 2003.
- Since 2007, habitat specialist butterflies have shown an apparent decrease from 24 per cent to 17 per cent of the 1976 level. Species of the wider countryside also show an apparent decrease, from 57 per cent to 46 per cent of the 1976 level. However, the underlying analysis shows that the apparent decline in specialist species and species of the wider countryside since 2007 is not significant, meaning that there has been no overall change for these measures in the five years to 2012.
- In 2012, habitat specialist butterflies decreased by 17 per cent from the previous year, whilst wider countryside species decreased by 28 per cent.
- As there are delays in submitting data, data for previous years are also updated retrospectively; in 2012 extra data were added for 2010 and 2011, for example. This means that the species indices for individual years may vary from previous assessments.

## C7. Plants of the wider countryside

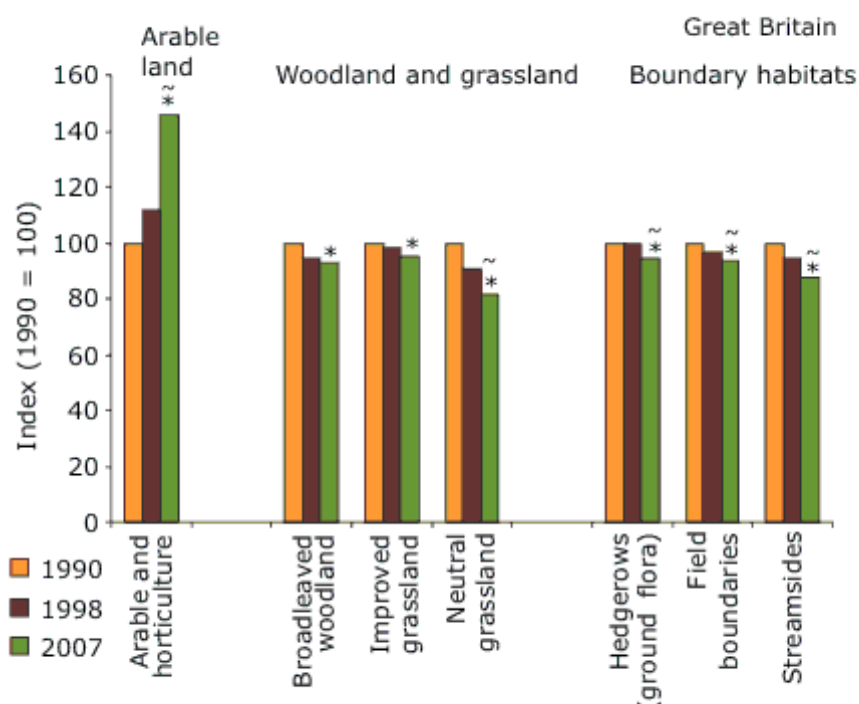
### a. Arable and horticultural land

### b. Woodland and grassland

### c. Boundary habitats

**Type:** State Indicator

**Figure C7i.** 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	Short Term	Latest year
Arable and horticultural land	✓ 1990–2007	✓ 1998–2007	N/A
Woodland and grassland	✗ 1990–2007	✗ 1998–2007	N/A
Boundary habitats	✗ 1990–2007	✗ 1998–2007	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, broad-leaved woodland and improved grassland, plant species richness

fell over the longer term by 19, seven and five per cent respectively and by ten, two and three 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 (since 1990) by 13, six and five per cent respectively and by seven, three and five per cent since 1998.

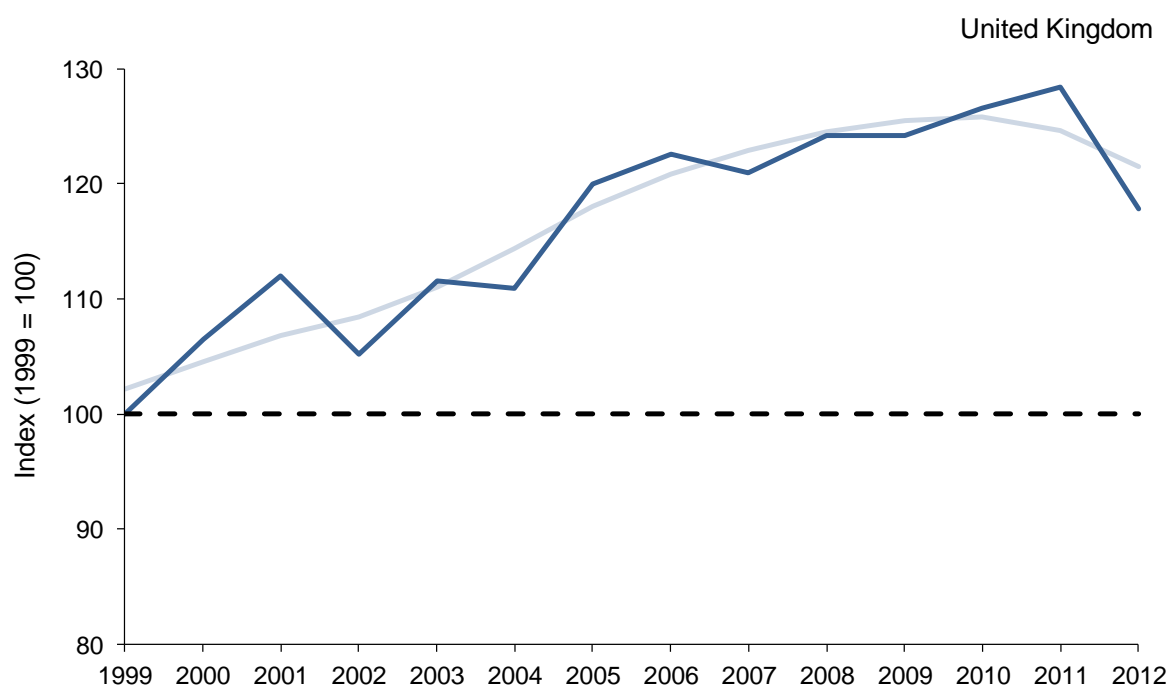
## C8. Mammals of the wider countryside (bats)

### a. Bat populations

### b. Historical pipistrelle bat roost counts

Type: State Indicator

**Figure C8i.** Trends in bat populations, 1999 to 2012.



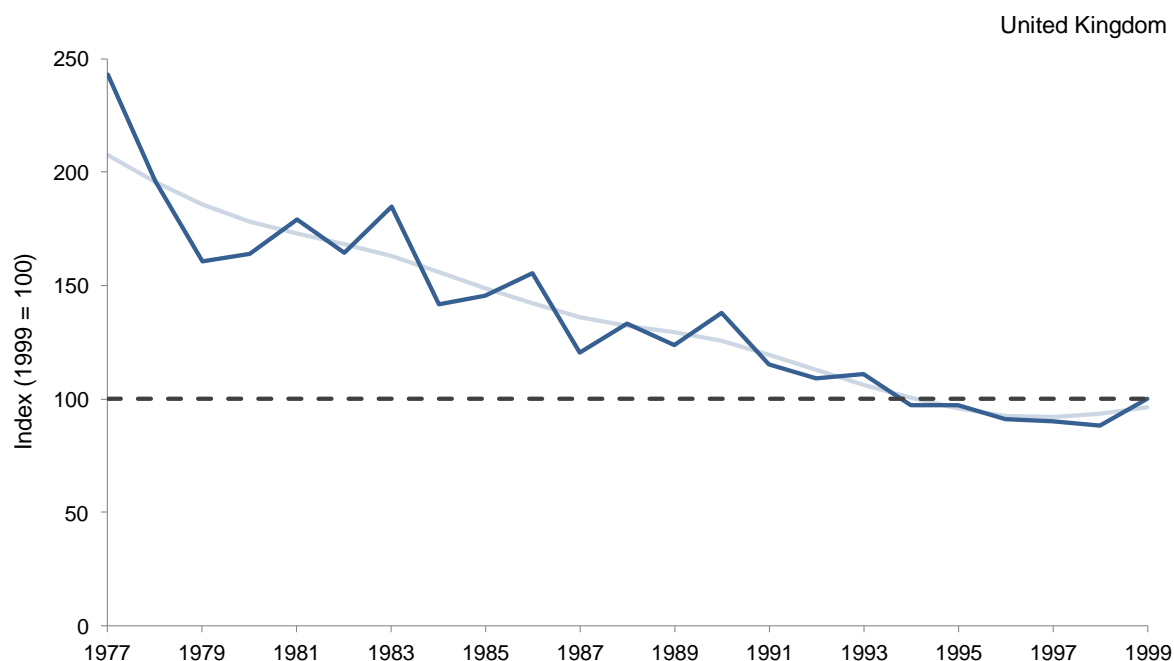
**Notes:**

1. The headline measure is a composite index of eight species: serotine, Daubenton's bat, Natterer's bat, noctule, common pipistrelle, soprano pipistrelle, brown long-eared bat and lesser horseshoe bat.
2. Darker line shows unsmoothed data, paler line shows smoothed trend data.

**Source:** Bat Conservation Trust.



**Figure C8ii. Historical declines in pipistrelle bat roost counts.**



**Notes:**

1. The graph is a composite index of common pipistrelle, soprano pipistrelle, and unidentified pipistrelle roost count data.
2. Darker line shows unsmoothed data, paler line shows smoothed trend data.

**Source:** Bat Conservation Trust, using data collected by Stebbings and published in Harris *et al.* 1995, plus more recent data.

Assessment of change in widespread bat populations			
	Long term	Short Term	Latest year
Bat populations	✓ 1999–2012	⚡ 2007–2012	Decreased (2012)
Historical pipistrelle bat roost counts	✗ 1977–1999	Not Assessed	Not Assessed

- 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.
- Since 1999 when trends from standardised large-scale monitoring became available through the National Bat Monitoring Programme, bat populations have increased by 18 per cent (Figure C8i). The most recent five year assessment shows a decrease of slightly less than three per cent in the index, giving a stable short-term assessment.
- Bats have undergone severe declines historically (Figure C8ii). Data from colony counts of pipistrelle bats show a 59 per cent decline from 1977 to 1999.

## C9. Genetic resources for food and agriculture

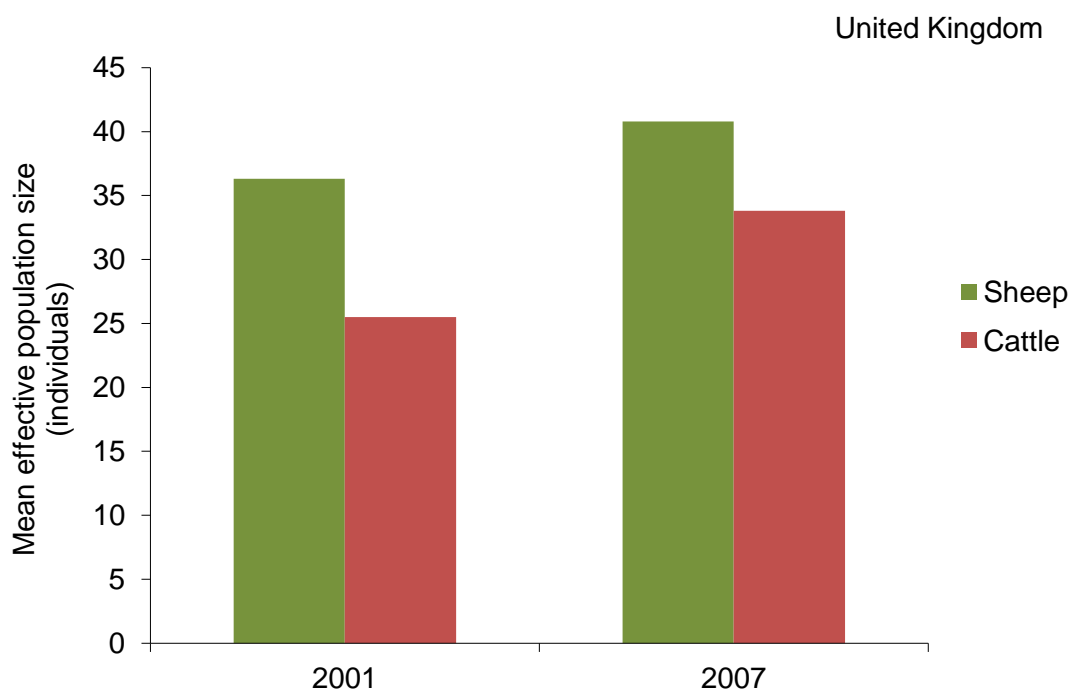
### a. Animal genetic resources – Effective population size

#### i. Native sheep breeds

#### ii. Native cattle breeds

Type: State / Benefit Indicator

**Figure C9i.** Change in mean effective population size for native breeds of sheep and cattle at greatest risk of loss of genetic diversity, 2001 to 2007.



**Notes:**

1. The 2001 values are based on assessments for 27 sheep breeds and 18 cattle breeds. The 2007 values are based on assessments for 26 sheep breeds and 20 cattle breeds.
2. 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*	Short term	Latest year
Native sheep breeds	⊖	⚡ 2001–2007	N/A
Native cattle breeds	⊖	✓ 2001–2007	N/A

\*A long term assessment is not made as the data do not go back more than 10 years.

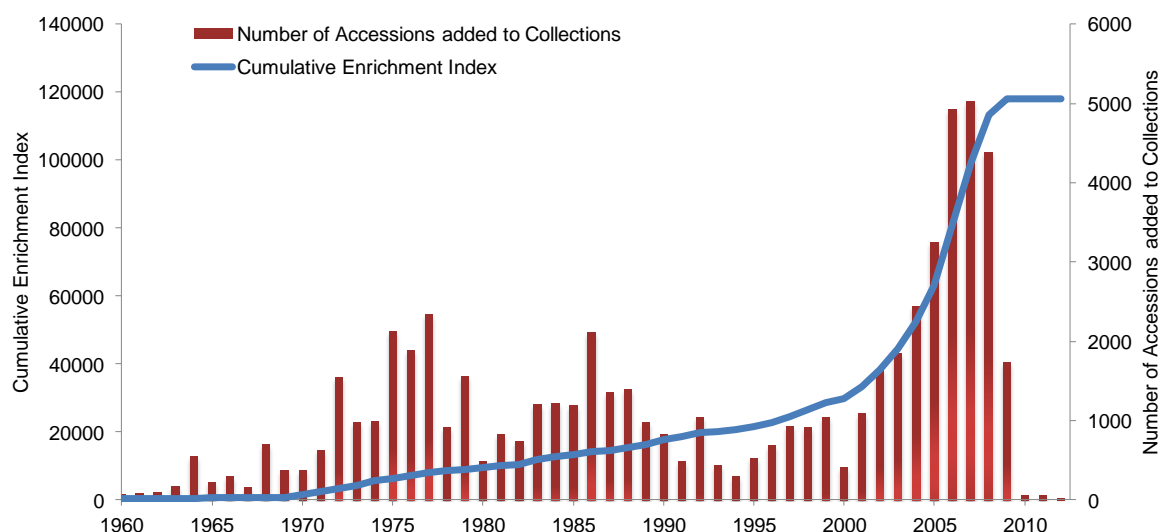
- Genetic diversity is an important component of biological diversity. Rare and native breeds of farm animals are part of our cultural heritage and are often associated with traditional land management required to conserve important habitats.

- 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 inbreeding 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 statistically significant due to variability in the data, and the measure is therefore assessed as showing little or no overall change.
- There has been no reported UK extinction of any breed of sheep or cattle since 2001.

## b. Plant genetic resources – Enrichment Index

Type: State / Benefit Indicator

**Figure C9bi. Cumulative Enrichment Index of plant genetic resource collections held in the UK, 1960 to 2012.**



### Notes:

1. An *accession* is a collection of plant material from a particular location.
2. The Enrichment Index is an assessment of the genetic diversity held in gene banks; it is affected by the number of accessions which are added in a given year, but provides a better reflection of the genetic diversity already held in gene banks as reduced weight is given to new accessions of existing taxa.

**Source:** EURISCO Catalogue (<http://eurisco.ecpgr.org>, date of data consultation: 2 October 2013), based on UK contributions from: Genetic Resources Unit, Institute of Biological Environmental & Rural Sciences, Aberystwyth University; Garden Organic - the Organic Organisation, Heritage Seed Library; Nottingham Arabidopsis Stock Centre; Germplasm Resources Unit, John Innes Centre, Norwich Research Park; Millennium Seed Bank Project; Science and Advice for Scottish Agriculture, Scottish Government; Warwick Crop Centre, Genetic Resources Unit.

### Assessment of change in status of *ex situ* conservation of cultivated plants and their wild relatives

	Long term	Short Term	Latest year
Cumulative Enrichment Index	✓ 1960–2012	✓ 2007–2012	No change (2012)

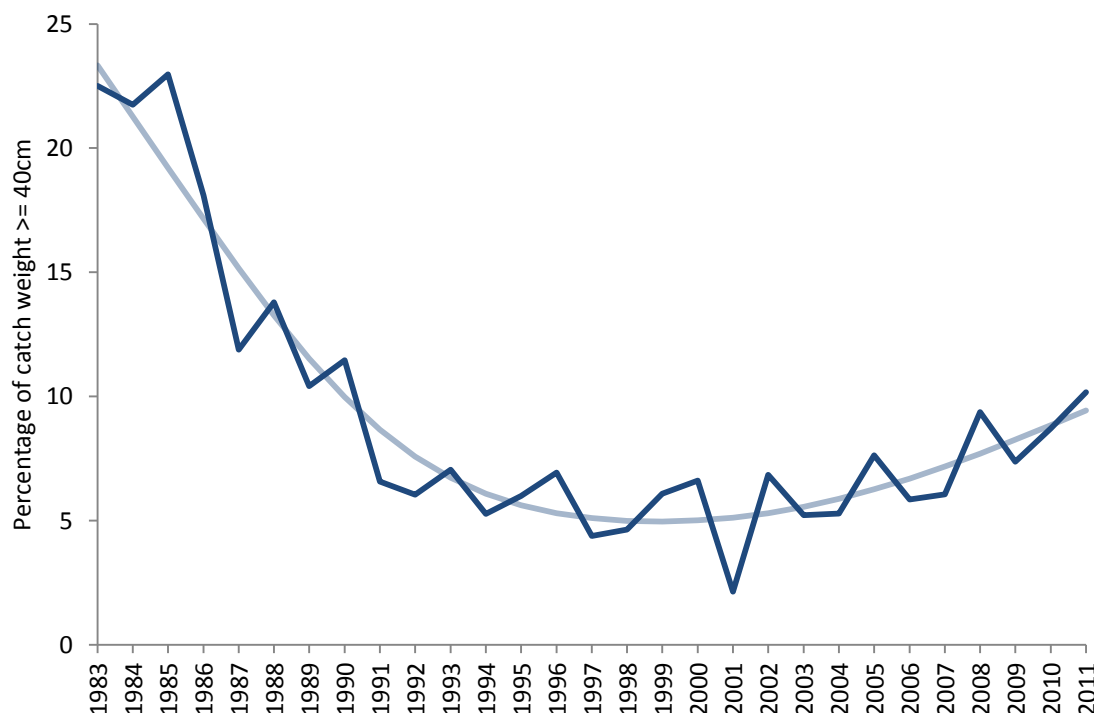
- Genetic diversity is an important component of biological diversity. The genetic diversity of UK plant resources includes domesticated plants and their wild relatives, as well as socio-economically and culturally valuable plant species. These encompass plants grown in a farming or horticultural setting, or both, as well as commercial cultivars, landraces and traditional varieties and their wild relatives. *Ex situ* conservation of cultivated plants and their wild relatives is one method used to preserve genetic diversity. In the context of this indicator, the term *ex situ* means off-site conservation of genetic material.
- There is considerable annual variability in the number of new accessions into UK germplasm collections. The total number of accessions has risen since the year 1960, peaking at 46,210 accessions of target species. A rapid rise in the Enrichment Index between the years 2000 and 2009 can be attributed to the concerted collection effort by the Millennium Seed Bank.
- There was a 19 per cent increase in the Enrichment Index between 2007 and 2012, but there has been virtually no change since 2010. This is partly as a result of a backlog in submitting information to EURISCO.
- The Enrichment Index is a proxy measure of genetic diversity based upon the assumption that genetic diversity increases (to a greater or lesser extent) with originality of accessions, which is estimated based on: the number of species collected; the number of accessions collected; the number of countries collected from; and the area from which collection took place.

## D1. Biodiversity and ecosystem services

### Marine - fish size classes in the North Sea

**Type:** State Indicator

**Figure D1i.** Proportion of large fish (equal to or larger than 40cm), by weight, in the North-western North Sea, 1983 to 2011.



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

Assessment of change in the proportion of large fish, by weight			
	Long term	Short term	Latest year
North-western North Sea	 1983–2011	 2006–2011	Increased(2011)

**Note:** The long term and short term assessments have been made by the Centre for Environment Fisheries and Aquaculture Science by fitting a smoothed trend to the index. The changes between 1983–2011 and between 2006–2011 were statistically assessed by calculating the difference in the smoothed values and an associated confidence interval.

- 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 fish which are large (40cm or greater in length) in the North-western part of the UK area of the North Sea.
- In 2011 the proportion of large fish in the North-western North Sea made up around 10 per cent of the weight of the fish community. This was a fall from about 23 per cent in 1983; however this is an increase from a low of 2.1 per cent in 2001. The proportion of large fish in the North-western North Sea rose by around 1.5 per cent between 2010 and 2011, based on the unsmoothed index. Large fluctuations in numbers between years are typical features of the size of North Sea fish populations.
- The measure for the North-western North Sea is used as the main indicator because it is based on the largest dataset and provides the most reliable indicator of change. In addition, the North Sea supports important fisheries and several are still recovering from over-exploitation. Although the figures are less up-to-date, there has been a similar modest increase in recent years in some other seas around the UK since 2000.

## D2. Biodiversity and ecosystem services (terrestrial)

### Indicator under development – progress to date

The benefits that humans receive from the environment have recently become more widely recognised. Four types of benefits were recognised in the Millennium Ecosystem Assessment: provisioning, supporting, regulating and cultural. Without these services humans would not survive on earth. Measuring the status of these services is therefore a critical aim of the indicator set.

The process of indicator development started by compiling a preliminary list of potential indicators from:

- the UK National Ecosystem Assessment (UK NEA, 2011);
- suggestions from an online survey of UK ecosystem service practitioners;
- indicators suggested at a workshop on measuring and monitoring ecosystem services in England's Nature Improvement Areas (NIAs) convened by the Biodiversity & Ecosystem Service Sustainability (BESS) group; and
- indicators used in the CBD 4<sup>th</sup> National Report.

UK specialists in the field of ecosystem services then met at a series of three workshops to tackle issues surrounding definitions, refine indicator suggestions, and develop indicator options that would be possible for implementation within a short timeframe. The quality of each potential indicator was evaluated against specified criteria in order to develop a shortlist of options.

The ecosystem services identified as key to the UK include: carbon sequestration, water quality and quantity, pollination, open access recreation, soil formation, (local) climate regulation, pest and disease regulation, food provision (wild fish), and wild species diversity.

Three indicator options were short-listed for development, and were reviewed through the [7<sup>th</sup> UK Biodiversity Indicators Forum](#):

A. Extent of land cover classified as urban

B. Community analysis of wild pollinators

B1: Bumblebee abundance

B2: Species richness of hoverflies and wild bees, based on presence/absence data for hoverflies and solitary/social bees

C. Carbon stock of forests in Great Britain

At the subsequent UK Biodiversity Indicators Steering Group in July 2013, it was decided that, as presented, the urban land cover measure was probably too simplistic. However, it was agreed that an indicator on urban standing ('sealed soil') would be more appropriate and that this might feasibly be developed in the future.

The measures on pollinators were considered by the Forum to be the most sound, and to complement each other well. At the UK Biodiversity Indicators Steering Group in July 2013, it was noted that there is insufficient data for the first measure (bumblebee abundance), which is based on information obtained from bee-walks, to be published in 2013, although it may be possible to publish this measure after an additional year of data has been collected, in 2014. The second measure (species richness of hoverflies and solitary bees) is to be incorporated within other work assessing trends in species distribution data to ensure the methodology being employed is consistent with that being used for other species indicators. Work assessing trends in species distribution data is on-going, and it is hoped a new measure based upon it will be published in 2014.

For the final measure, carbon stocks, it was noted that a methodology was available for estimating carbon storage and sequestration of forests, but that there is no clear methodology for peatlands. This is being further investigated; it is possible that, should a methodology for peatlands not be available, the extent and condition of peatland habitat might form a proxy indicator of carbon stocks.

## **E1. Biodiversity data for decision making**

### **Indicator under development – progress to date**

Good policy making and evaluation is based on evidence. We need evidence to guide our decisions, from issues of national policy to choices about individual site management. We also need to continue to develop and test solutions to address biodiversity loss and engage people, natural resource managers and business.

Potential datasets which might inform this indicator have been identified. The next stage is to further develop initial ideas into a workable measure that can be implemented in 2014.



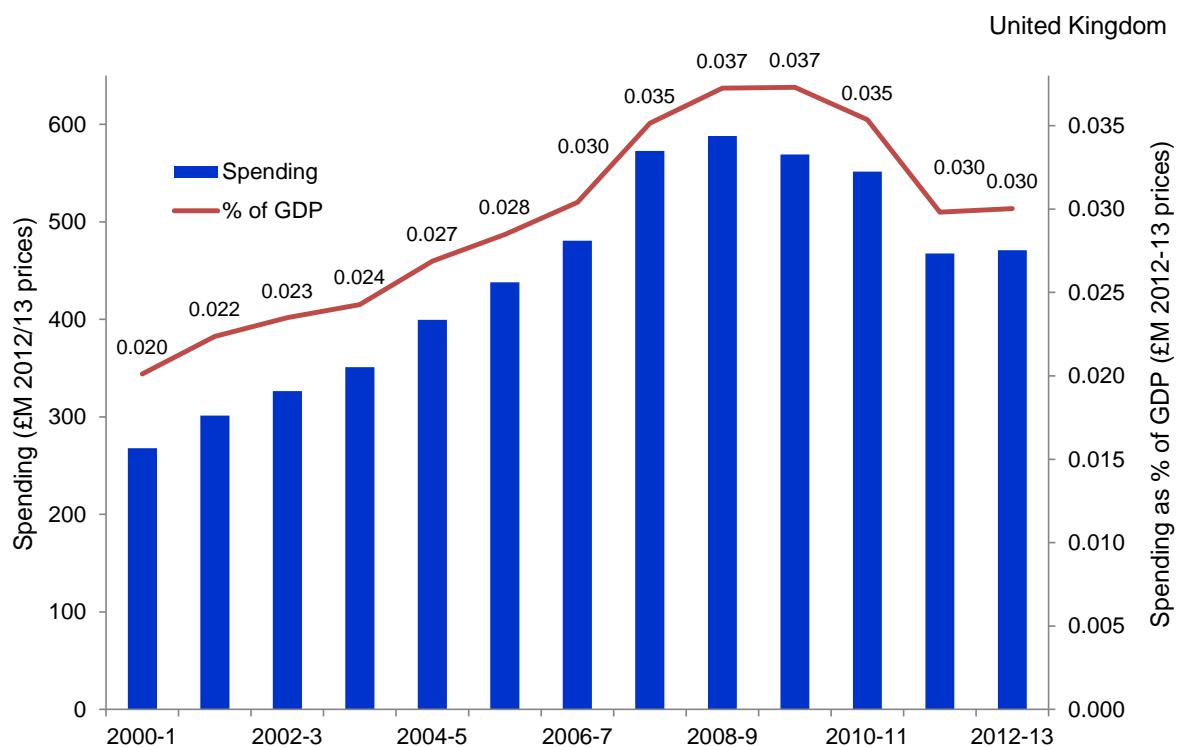
## E2. Expenditure on UK and international biodiversity

### a. Expenditure on UK biodiversity

### b. UK expenditure on international biodiversity

Type: Response Indicator

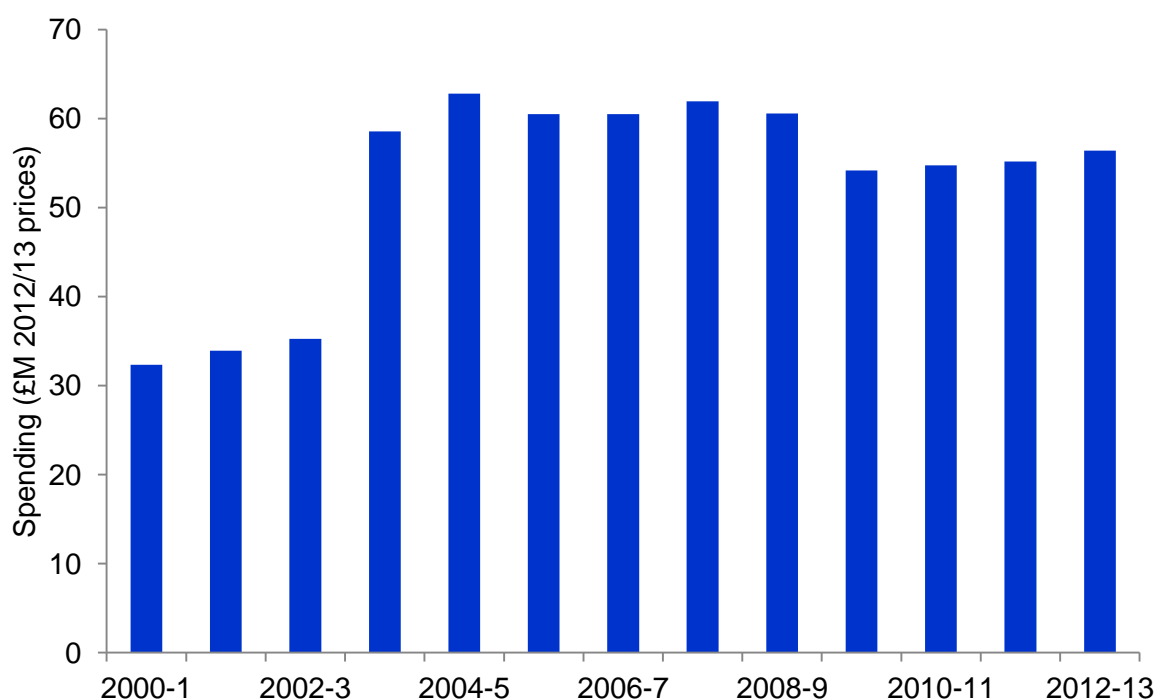
Figure E2i. Public sector expenditure on biodiversity in the UK, 2000-1 to 2012-13.



Notes: Deflated using UK Gross Domestic Product Deflator, published 27<sup>th</sup> June 2013.

Source: Defra, Her Majesty's Treasury.

**Figure E2ii. UK public sector expenditure on international biodiversity 2000-1 to 2012-13.**



**Notes:** Deflated using UK Gross Domestic Product Deflator, published 27<sup>th</sup> June 2013.

**Source:** Defra.

Assessment of change in public expenditure on biodiversity			
	Long term	Short term	Latest year
Public sector expenditure on biodiversity in the UK	✓ 2000/1 – 2012/13	✗ 2007/8 – 2012/13	No change (2012-13)
UK public sector expenditure on international biodiversity	✓ 2000/1 – 2012/13	✗ 2007/8 – 2012/13	Increased (2012-13)

- Spending is one way of assessing the priority that is given to biodiversity within the UK public sector. Funding for international biodiversity is essential for the implementation of the Convention on Biological Diversity in developing countries.
- In 2012-13, £470.9 million of UK public sector funding was spent on UK biodiversity; this value has remained stable since 2011-12. Between 2000-1 and 2012-13, public sector spending on UK biodiversity increased by 76 per cent in real terms, although it declined between 2008-9 and 2011-12.
- In 2012-13, UK public sector funding for international biodiversity totalled £56.4 million. International spending by the UK public sector has increased by 74 per cent since 2000-1 in real terms. There was a reduction of 11 per cent in 2009-10 compared with 2008-9, since when spending has increased gradually at about one per cent a year.
- GDP in the UK has remained stable since 2011-12; in 2012-13 GDP in the UK was £1,568 billion. Since 2000-1, UK GDP has grown by 18 per cent. Public sector funding on UK biodiversity relative to GDP has remained stable in 2012-13 compared to 2011-12.

## Enquiries about biodiversity indicators or this publication

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This publication has been produced by Biodiversity and Ecosystems Evidence, and Biodiversity and Ecosystems Statistics Teams (Defra) working with the Joint Nature Conservation Committee (JNCC).

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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](http://www.jncc.defra.gov.uk/biyp).

## Annex: National Statistics

Some key Governmental statistical outputs are designated as National Statistics. The Statistics and Registration Service Act 2007 gives the UK Statistics Authority a statutory power to assess sets of statistics against the Code of Practice for Official Statistics. Assessment will determine whether it is appropriate for the Statistics to be designated as National Statistics.

Designation as National Statistics means that the statistics comply with the Code of Practice. The Code is wide-ranging. Designation can be interpreted to mean that the statistics: meet identified user needs; are produced, managed and disseminated to high standards; and are explained well.

Designation as National Statistics should not be interpreted to mean that the statistics are always correct. For example whilst the Code requires statistics to be produced to a level of accuracy that meets users' needs, it also recognises that errors can occur – in which case it requires them to be corrected and publicised.

The UK Biodiversity Indicators (published as Biodiversity Indicators in Your Pocket) is a Defra National Statistics compendium. The designation does not mean that all the individual statistics presented are National Statistics in their own right. Rather it means that the compilation and publication has been undertaken in compliance with the Code of Practice.

The following individual statistics presented in the publication are National Statistics:

B1. Area of forestry land certified as sustainably managed

C5. Birds of the wider countryside and at sea

Although all other statistics in this compendium are not designated as National Statistics individually this is not to suggest that they should be regarded as being less reliable, as all are subject to rigorous quality assurance by the data owners and general quality assurance by Defra and the Joint Nature Conservation Committee. The presentation of the statistics, the commentary, and the traffic light assessments have been overseen and quality assured by Defra Statisticians.